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Forest Products

Annual Market Review 2013-2014

UNITED NATIONS

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Annual Market Review 2013-2014

Geneva Timber and Forest Study Paper 36

Forestry and Timber Section, Geneva, Switzerland

ECE/TIM/SP/36

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NOTE

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DISCLAIMER

The views expressed in this paper are those of the authors and do not necessarily reflect the views or carry the endorsement of the United Nations.

ABSTRACT

The *Forest Products Annual Market Review, 2013-2014* 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 and innovative wood products. Statistics-based chapters analyse the markets for wood raw materials, sawn softwood, sawn hardwood, wood-based panels, paper, paperboard and woodpulp. Other chapters analyse policies, innovative wood products and markets for wood energy, value-added wood products and housing. 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

It has been exactly five years since the theme of the *Forest Products Annual Market Review* was, "The UNECE region's forest products markets in a global economic crisis." The crisis left the UNECE region with substantially diminished demand for forest products, putting many mills and forest operations in difficulty. Forest products markets suffered the cyclical economic strains of recession together with structural changes in the landscape of forest products markets. Forest industries of the UNECE region found a strong demand in the Middle East, North Africa, and Asia. Increasingly, however, unprocessed wood from the UNECE region is exported outside the region; where it is manufactured into fully processed forest products which then compete with forest products from the UNECE region. Currently, 40% of Chinese raw wood imports are from the UNECE region, much of which ends up as furniture exports to the UNECE, which accounts for 2/3rds of China's furniture exports. There are many other examples. There have also been other fundamental, societal changes occurring that have significant ramifications for the forest sector.

Technology is changing the way we communicate. It has changed the way in which we receive/pay bills, and how we read books, news and other media. This is greatly affecting the forest products industry. To underscore this point, consider that over the last 15 years, the US has lost more than half of its production capacity for newsprint. Who would have known in the late 1990s, when less than one in five households in the more advanced economies in the UNECE region had Internet access, that fixtures of society and anchor products of the forest industry, such as newsprint and graphic paper, would be in serious decline, due in great part to advances in communication technology.

The environmental emphasis put on forests also continues to change traditional business modes in the industry. Society cares deeply about forests and recognizes the importance of forests for providing clean air, pure water, carbon storage, protection to biodiversity, scenery, recreation, and for preserving places where society can see the environment in its natural state. The forests and forest industries within UNECE region have a good sustainability record and have been increasingly held to high standards that other, more widely used, non-sustainable products, such as cement and steel, are not.

This year's *Forest Products Annual Market Review* provides a look back at how these and other dynamics have shaped forest products markets and trends in 2013 and into 2014. It provides data and market intelligence on how forest products in the UNECE region, while still bruised from the crisis, are slowly emerging to find firmer footing. The *Review* also points to the future, when wood products will hold many of the keys to improving the sustainability of the region's economy. Innovations in wood energy, tall buildings built with engineered wood products such as cross-laminated timber and new-generation wood-based fabrics which can fill society's need for sustainable clothing, offer tremendous opportunities for forest products industries to grow their market share. Stakeholders and policymakers should consider the active role that the forest products produced within the UNECE region can play by providing its customers with some of the world's most sustainable solutions.

Eoin O'Driscoll

Team Leader
UNECE/FAO Team of Specialists on Sustainable Forest Products

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The *Forest Products Annual Market Review* is the result of a cooperative effort involving a network of official country correspondents, authors, reviewers, editors, the UNECE/FAO Team of Specialists on Sustainable Forest Products and a team of people working in the Forestry and Timber Section in Geneva and in FAO, Rome. In combination, this network provides an unrivalled source of expertise and knowledge, which is the hallmark of the *Review*.

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 valued annual publication. This edition could not have been published without the financial support of the governments of Sweden and Switzerland.

The *Review* benefits from a longstanding partnership with the Department of Forest Sciences at the University of Helsinki, which provides two marketing assistants every year. This year, Sonja Sistonen and Lyydia Ylönen undertook market research; prepared price data; generated all the graphics and revised the Graphics Production System; and produced the websites associated with the *Review*. Their input has been critical for ensuring the quality of the publication and meeting deadlines. Professor Anne Toppinen and Lei Wang at the Department of Forest Sciences facilitated these annual internships: we thank them and look forward to continuing this mutually beneficial arrangement. We also thank Igor Novoselov in Moscow for providing market intelligence for the chapter on wood raw materials.

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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In all, 48 people were directly involved in the preparation of this publication, not including the additional contributors and statistical correspondents listed separately on the following pages.

The manuscript was completed on 13 August 2014.

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[1] *Forest Products Statistics* is available at: www.unece.org/forests/fpm/onlinedata.html

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DATA SOURCES

The data on which the *Forest Products Annual Market Review* is based are collected from official national correspondents through the FAO/UNECE/Eurostat/ITTO Joint Forest Sector Questionnaire, distributed in April 2014. Within the 56-country UNECE region, data for the 32 EU and EFTA countries are collected and validated by Eurostat and for other UNECE countries by UNECE/FAO Geneva.

The statistics for this Review are from the TIMBER database system. Because the database is continually updated, any single publication provides only a snapshot of the database. Data quality differs between countries, products and years. Improving data quality is a continuing task of the secretariat.

With our partner organizations and national correspondents, we strongly believe that the quality of the international statistical base for analysis of the forest products sector is improving steadily. The goal of the partner organizations is to have is to have a single, complete, current database, validated by national correspondents, with the same data available from FAO in Rome, Eurostat in Luxembourg, ITTO in Yokohama and UNECE/FAO in Geneva. We are convinced that the dataset used in the *Review* is the best available anywhere, as of August 2014.

The data in this publication form only a small part of the total data available. *Forest Products Statistics* will include all available data for the years 2009-2013. The TIMBER database is available on the website of the joint Committee on Forests and the Forest Industry and European Forestry Commission at www.unece.org/forests/fpm/onlinedata.html.

The secretariat is grateful that correspondents provided actual statistics for 2013 or, in the absence of formal statistics, their best estimates. Therefore, all statistics for 2013 are provisional and subject to revision at a later date. The responsibility for national data lies with the national correspondents. The official data supplied by correspondents account for the great majority of records. In some cases, where no data were supplied, or when data were confidential, the secretariat estimated figures to keep regional and product aggregations comparable and to maintain comparability over time. Estimates are flagged in this publication, but only for products at the lowest level of aggregation.

Despite the best efforts of all involved, some significant problems remain. Chief among these are differing definitions, especially when these aren't specified in the data, and unrecorded removals and production. For wood fuel removals, for example, the officially reported volumes may be as low as 20% of actual removals in some countries. The Joint Wood Energy Enquiry has gone some way towards improving the quality and coverage of data for wood energy. Conversions into the standard units used here are also not necessarily done in a consistent manner. The Joint FAO/UNECE Working Party on Forest Statistics, Economics and Management is carrying out work to increase awareness of problems in measurement and how to deal with these. Intra-EU trade, for instance, is less reliable than extra-EU trade.

In addition to the official statistics received through the Joint Forest Sector Questionnaire, trade-association and government statistics have been used to complete the analysis for 2013 and early 2014. Supplementary information was obtained from experts, including national statistical correspondents, trade journals, the United Nations trade database (COMTRADE) and websites. These sources are given in the text.

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".

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 2013 is €0.75 = $1 and for the Russian rouble is 31.94 RUB = $1. Both these exchange rates are based on the annual average of the UN Operational Rates of Exchange provided by the Treasury of the United Nations (treasury.un.org).

Forest products here include primary products such as roundwood, sawnwood, wood-based panels, pulp and paper. Further-processed products (e.g. builders' joinery, windows, cut paper, boxes, engineered wood products) are excluded.

"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 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.

For a breakdown of the region into its subregions, please see the map in the annex. References to EU27 refer collectively to the 27 country members of the EU in 2012 (prior to Croatia joining in July 2013, after which the country members of the EU are referred to collectively as EU28). The term Commonwealth of Independent States (CIS) refers collectively to 12 countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. It is used solely for the reader's convenience.

The term "softwood" is used synonymously with "coniferous". "Hardwood" is used synonymously with "non-coniferous" or "broadleaved". More definitions appear in the electronic annex.

All references to "ton" or "tons" 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 metric tonne of wood fibre means 1,000 kg of wood fibre containing no moisture at all.

The term "chemical pulp" refers to semi-chemical woodpulp, chemical woodpulp and dissolving grades, unless otherwise indicated.

ACRONYMS, ABBREVIATIONS AND SYMBOLS

…	not available
€	euro
$	US dollar unless otherwise specified
AHEC	American Hardwood Export Council
APA	The Engineered Wood Association
BC	British Columbia, Canada
BJC	builders' joinery and carpentry
CAN	Canadian dollar
CEPI	Confederation of European Paper Industries
CFP	certified forest product
CIF	cost, insurance and freight
COFFI	Committee on Forests and the Forest Industry
CIS	Commonwealth of Independent States
CLT	cross-laminated timber
CO_2	carbon dioxide
CoC	chain-of-custody
CSA	Canadian Standards Association
EFI	European Forest Institute
EFTA	European Free Trade Association
EU	European Union
EUTR	European Union Timber Regulation
EWPs	engineered wood products
FSC	Forest Stewardship Council
FOB	free on board
GDP	gross domestic product
GHG	greenhouse gas
Gj	gigajoule
GWh	gigawatt hour
ha	hectare
IMF	International Monetary Fund
ITTO	International Tropical Timber Organization
kWh	kilowatt hour
LVL	laminated veneer lumber
LSL	laminated strand lumber
m.t.	metric ton or tonne
m^2	square metre
m^3	cubic metre
MBF	one thousand board feet
MDF	medium-density fibreboard
MSF	one thousand square feet
MTCS	Malaysian Timber Certification System
MWe	megawatt electrical
MWth	megawatt thermal
NGO	non-governmental organization

OSB	oriented strand board
OSL	oriented strand lumber
PEFC	Programme for the Endorsement of Forest Certification
PJ	petajoule
PoC	Province of China
PSL	parallel strand lumber
REDD	Reducing Emissions from Deforestation and Forest Degradation
SAR	Special autonomous region (of China)
SFI	Sustainable Forestry Initiative
SFM	sustainable forest management
TMT	thermally modified timber
UK	United Kingdom of Great Britain and Northern Ireland
US	United States of America
USDA	United States Department of Agriculture
VAT	value-added tax
VAWPs	value-added wood products
WPCs	wood-plastic composites

1 OVERVIEW OF FOREST PRODUCTS MARKETS AND POLICIES

Author of economic overview: Robert Shelburne

HIGHLIGHTS

- North America is likely to see faster economic growth in 2014-2015 than either Europe or the CIS.
- Negotiations between the EU and the US on a trade agreement called the Transatlantic Trade and Investment Partnership began in July 2013 and are expected to continue through 2014. The proposed agreement could significantly benefit the forest sector by reducing tariffs on chemical processing agents and machines as well as non-tariff barriers such as rules and regulations on forest products.
- Viscose, a wood-derived fibre, comprises 6% of the global fibre market. It occupies third place in that market, after synthetics and cotton and ahead of wool. While traditional viscose has many environmental flaws, modern wood-based fibres can be considered as the most sustainable of the world's four most commonly produced fibres.
- The consumption of industrial roundwood in the UNECE region was 984 million m^3 in 2013, 1% higher than in 2012 and 17% more than in 2009; the Global Sawlog Price Index reached \$89.45/m^3 in the first quarter 2014, the third-highest price since the inception of the Index in 1995.
- Apparent sawn softwood consumption rose by 5.2% in North America in 2013 and by 8.8% in the CIS. In Europe, however, demand dropped for the third consecutive year, by 1.7%. China has become a key alternative market for sawnwood producers in Canada, Europe and the US.
- North American and CIS sawn hardwood consumption both increased by 12% in 2013, to 17 million m^3 in North America and to 2.1 million m^3 in the CIS. European sawn hardwood consumption fell by 4.8%, to 12.3 million m^3.
- The consumption of wood-based panels increased by 2% in Europe in 2013, Russian demand and production increased slightly, and structural panel consumption increased by almost 7% in North America, pushed up by increased construction.
- Paper and paperboard production rose in North America (mainly as a result of increased demand for packaging) but decreased in Europe and the CIS. North American newsprint capacity has fallen by more than half since 2000, from 15 million tonnes to just 6.7 million tonnes in 2014.
- Recent data show an increase in wood energy consumption in the UNECE region, with solid biofuels, of which the vast majority is wood, accounting for 10.5% of primary energy production in the EU27 in 2012. North America exports of wood pellets to the EU reached a new high of 4.6 million tonnes in 2013, and Russian pellet production remained at 1.5 million tonnes in 2013.
- New construction in Europe contracted, but housing completions in the Russian Federation achieved record levels in 2013, with a total of 912,100 new dwellings built, an increase of 10.3% over 2012. The US housing market was mixed in 2013: there was substantial improvement in the first half of the year, but sales waned in the second half.

1.1 INTRODUCTION TO THE PUBLICATION

The 2014 edition of the UNECE/FAO *Forest Products Annual Market Review* provides a comprehensive review of market developments in the UNECE region in 2013 and of the policies driving those developments. The UNECE region is made up of 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 includes almost all boreal and temperate forests in the Northern Hemisphere and covers about 1.7 billion hectares, which is just under half the world's total forest area and almost 38% of the land area of the UNECE region.

The *Review* serves as a background document for the joint session of the UNECE Committee on Forests and the Forest Industry, which will take place on 18-21 November 2014 in Kazan, the Russian Federation.

This chapter acts as an executive summary, providing an overview of the following ten chapters.

Section 1.2, which follows this section, gives a background on the macroeconomic health of the region. The effects of the economy are further elaborated on in each of the chapters, which outline the impacts of the economic situation on particular sectors and geographical regions.

The second chapter provides background on policies and market tools that are influencing the forest products sector, including those related to trade, energy and the environment (e.g. certified forest products, carbon accounting and markets, and green building).

Chapter 3 focuses on innovative wood products, which this year highlights wood-based fabrics and some of the innovations that may put these wood products at the forefront, not only because of their potential to improve the sustainability of the garment industry, but also because they are likely to increase market demand for wood fibre.

The following seven chapters cover the major forest product sectors. The Review closes with a chapter on housing, which is a leading driver of wood consumption in the UNECE region.

The Review presents and analyses the best available annual statistics for the period 2013-2014 collected by the UNECE/FAO Forestry and Timber Section from official country statistical correspondents and expert estimates.

Note that the trends discussed in this publication comprise a mix of data from the UNECE/FAO Forestry and Timber database (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. A strong effort has been made to reconcile data and trends, but occasionally there are small differences between sources. Additionally, there are times when authors may point to trends or data for a different geographic aggregation than the standard subregions. References to "Europe", the "CIS" and "North America" in this publication always pertain to the standard subregions.

Electronic annexes[2] provide additional statistical information, and the full UNECE/FAO TIMBER database, which was updated with statistics from national correspondents in July 2014, is also available on the web.[3] These comprehensive statistics, which form the basis of many of the chapters, ensure data transparency in the Review. References at the end of each chapter not only support and give credit for the ideas expressed in the chapter but also provide sources for further reading and research.

A common thread in the 2014 edition of the Review is the analysis of markets outside the region. Forest products are increasingly traded at the global level; markets in, for example, Brazil, China, Egypt, Japan and New Zealand, may therefore have a pronounced effect on forest products markets in the UNECE region.

1.2 ECONOMIC DEVELOPMENTS WITH IMPLICATIONS ON THE FOREST SECTOR

The world economy remains fragile as it enters its fifth year of recovery after the worst economic downturn since the Second World War. Generally, the UNECE region was affected negatively by the global financial crisis in 2008-09 to a greater extent than were other regions, and it has also experienced the most sluggish recovery. Even though the US housing market was the epicentre of the global financial crisis, North America is likely to grow significantly faster in 2014-2015 than either the advanced European economies (including all European Union – EU – member countries) or the emerging market economies in southeastern Europe and the CIS. Not only is there still significant unemployment and unused capacity in much of the UNECE region, growth in the years ahead is likely to be lower than before the global financial crisis because of the six years of depressed private and public-sector investment and the depreciation of human capital, which itself was the result of years of high unemployment. Further magnifying the weak growth in the emerging economies of southeastern Europe is the uncertainty associated with political developments in Ukraine.

As a result of weak growth and excess capacity, inflation remains subdued in most of the region, with rates in North America and western Europe significantly below central-bank targets (generally in the 2% range) and rates in the emerging economies a few percentage points higher but still below historical trends. These very low inflation rates have resulted in very low interest rates, which have brought about an escalation in prices for a broad range of assets, including housing, as investors search for higher yields. Low inflation combined with the rapid increase

[2] www.unece.org/forests/fpamr2014-annex
[3] www.unece.org/forests/fpm/onlinedata

in asset prices has put central banks in a quandary as to whether monetary policy should be loosened further to deal with unemployment, or tightened to deal with the rise in asset prices. The preferred policy option is to use monetary policy to address unemployment and macro prudential policy to control asset prices. The return to more normal financial conditions in the next year or two may result in considerable volatility in asset markets, which would present a significant downside risk for the global economy.

The economic situation in the eurozone was at its worst where unemployment peaked at over 12%, which was a historical high; a very sluggish recovery appears to have begun now, although unemployment remains above 11%. The global financial crisis had a particularly negative impact on the budget deficits of many eurozone economies. With government debt already high in some countries, there was a crisis of confidence about whether sovereign debt could be repaid, resulting in financing difficulties in several economies. The gravity of the situation was intensified by the design of the eurozone, because the central bank (the European Central Bank) was unwilling to act as "lender of last resort" for this sovereign debt (as is generally the case in advanced economies). As the crisis deepened the European Central Bank was eventually compelled to provide a conditional guarantee, which restored stability to affected countries. With a collapse in private-sector spending because of the global financial crisis, more public-sector spending was needed to fill the gap, but fiscal expansions were limited by other eurozone institutional factors, such as the Stability and Growth Pact. With these constraints on conventional macroeconomic tools, growth in the eurozone is likely to reach only about 1% in 2014 and 1.5% in 2015, and unemployment will remain high for at least several more years.

There was more flexibility in the use of expansionary monetary and fiscal policy in the US in the six years and, as a result, the economic recovery in the US has been more robust. By mid-2014, the unemployment rate had fallen to about 6%, only one percentage point above a level many consider "full employment". Even though house prices have recovered considerably from their large declines associated with the global financial crisis, and the excessive inventory of the last few years has been corrected by a large slowdown in construction, weak wage growth has resulted in issues of affordability. Nevertheless, economic growth in the US should be slightly above 3% in 2014 and 2015, and unemployment should continue to decline slowly.

The economic situation in the region's emerging economies is more problematic and subject to considerable uncertainty. The economic situation in Ukraine continues to deteriorate, and economic sanctions may reduce growth in the Russian Federation to only about 0.2% in 2014. The outlook for the CIS in 2015 is dependent on how the current geopolitical crisis is resolved. Belarus and Republic of Moldova are likely to be similarly affected by the economic sanctions because of their strong links to the Russian Federation. Economic growth in the central Asian CIS member states has declined due to their linkages with the Russian Federation, but high energy prices will likely sustain reasonable growth in those countries. The economies in southeastern Europe have been growing only moderately because of weak economic conditions in the eurozone as well as in Belarus, Republic of Moldova and Ukraine. Economic growth in southeastern Europe is forecast at 2.5% in 2014 and 3.4% in 2015, led by Turkey. Except for Turkey, unemployment remains high in most of these countries (often above 20%).

1.3 POLICY AND REGULATORY DEVELOPMENTS AFFECTING THE FOREST PRODUCTS SECTOR

Policies relating to wood and forest product markets – from trade agreements to building codes – continue to influence how, when and where wood is used as a material in building, energy and economic development. The EU Timber Regulation, the new EU Forest Strategy and the developing Transatlantic Trade and Investment Partnership (TTIP) trade agreement are key initiatives. Efforts to grow certification, support green building and develop carbon and other ecosystem services markets will also continue to have an impact.

The EU Forest Strategy, which was adopted on 20 September 2013, responds to new challenges facing the EU forest sector and to key policy developments in the EU. Key outputs of the EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan, which marked its tenth anniversary in 2013, are voluntary partnership agreements (VPAs) between the EU and tropical timber-supplying countries. By May 2014, six VPAs had been signed between the EU and Cameroon, the Central African Republic, the Republic of the Congo, Ghana, Indonesia and Liberia.

A report published by the European Commission assessed the impact on deforestation of EU consumption of all products and services, not just those derived directly from forest management. The report attributed 200,000 hectares of the total global deforestation between 1990 and 2008 (232 million hectares) to EU imports of wood products, and 8.7 million hectares to EU imports of agricultural cash crops and livestock products. The report estimated that, worldwide, 33% of the deforestation embodied in crops and 8% of deforestation embodied in livestock products enter international markets. This implies that policy measures targeting the consumption of agricultural commodities would be at least as effective in reducing deforestation as those targeting timber products.

In May 2014, the major global certification schemes – the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) – reported a total gross area of 440.3 million hectares under their individual (endorsed) certification standards. The total certified area grew by 3.8% (16 million hectares) during the preceding year

ending in May 2014, which was half the growth in the previous 12 months. Estimated industrial roundwood production from certified forests increased by 20-30 million m^3 per year between May 2011 and April 2014, reaching 524 million m^3. Thus, about 30% of global industrial roundwood production (1.7 billion m^3) was derived from certified forest.

The US Green Building Council (USGBC) approved version 4 of the Leadership in Energy & Environmental Design (LEED) green building standard in June 2013. In the Materials and Resources section of that standard, prescriptive measures have been replaced with credits related to life-cycle analysis (LCA), LCA-based environmental product declarations (EPDs), materials ingredients verification, and raw-material extraction.

The main carbon market, the EU Emissions Trading System (EU ETS), is still marked by uncertainty about its cost-efficiency and impact. In the first quarter of 2014, a record 2.8 billion European carbon allowances were traded on Europe's four main emissions exchanges, an increase of 12% over the same quarter in 2013, despite a cut in supply.

1.4 INNOVATIVE WOOD-BASED PRODUCTS

Developments in the wood-derived fabric industry continue to support the status of wood as a preeminent sustainable source of fibre for the world's clothing. Despite its problems, wood-derived viscose in its various forms is already an important player, accounting for 6% of the world fabric market. It occupies third place in that market, after synthetics and cotton and ahead of wool.

Traditional viscose has its environmental downside because toxic chemicals are used in its production. However, various "closed loop" systems have ensured that such chemicals are re-used and not released into the environment, and second-generation wood-derived fabrics, such as Lenzing's Tencel®, produced by the Lyocell process, have good green credentials in their sourcing and production.

Wood-derived fibres are a close substitute for cotton, which carries huge undesirable environmental consequences. Because there are land and water restrictions on the continued expansion of cotton, it is expected that the production of wood-based fibres will increase to fill the gap over the next few years. Proximity to a competitively priced source of wood is a key variable driving production costs for wood-derived fibres; many countries in the UNECE region are well-placed, therefore, to take advantage of this potential boom.

With this in mind, UNECE arranged the "Forests for Fashion – Fashion for Forests" event in Geneva in 2014, showcasing wood-based fabrics to designers and commentators in the fashion and related industries. One point that came across strongly is the need to encourage consumer demand for wood-fibre-based fabrics, which implies a need for greater cooperation, both between producers of sustainable fibres and with other parts of the fabric production chain to ensure clear labelling and consumer confidence.

Source: UNECE/FAO, 2014.

There is also a need to raise public awareness of what is – and is not – a sustainable fabric, because many people continue to buy cotton on the grounds that it is "natural". Finally, because the fabrics industry is highly vulnerable to public opinion, the issue of waste fabric must be addressed to ensure wood-derived fibres obtain the impeccable credentials they need.

1.5 SUMMARY OF REGIONAL AND SUBREGIONAL MARKETS

The overall condition of forest products markets in the UNECE region is improving (table 1.5.1). European markets are stagnant, but industry consolidations and increased exports (created by demand from China and other extra-regional export destinations) have helped much of the wood sector to find firmer footing in markets that are more certain and predictable.

The CIS experienced moderate growth in most forest products in 2013, assisted by a strong year for construction in the Russian Federation and many of the other CIS countries. Investments in new plants and recapitalizing old plants were a sign of optimism and confidence. Exports have been a strong feature of growth in the subregion, but unfolding geopolitical developments could negatively affect some of these markets (and possibly domestic markets as well). There was a drop in the production and consumption of pulp and paper in the CIS in 2013; however, the reconstruction and restructuring of the Russian pulp and paper industry is now a priority and should help future prospects.

North America continued to show strong positive movements in markets for most wood products. This was a result of the recovery in the housing sector, an improved economic situation, and increased exports of products and roundwood to Asia and of wood pellets to Europe

1.5.1 Wood raw materials

A worldwide rise in demand for forest products in 2013 resulted in the highest timber harvest in the UNECE region in six years. Removals of industrial roundwood, which reached 1 billion m^3 in 2013, have been trending upward for five years and were more than 17% higher in 2013 than in 2009. The increase in timber removals in 2013 compared with 2012 was greater for softwoods than for hardwoods. Since 2009, however, harvests of hardwood species have risen at a faster rate than those of softwoods. Overall harvest levels increased by almost 2% in Europe and the CIS in 2013 (compared with 2012) and by 0.3% in North America.

The consumption of industrial roundwood by the forest industry in the UNECE region was 984 million m^3 in 2013, which was 1% higher than in the 2012. This was the fourth consecutive annual increase, with the manufacturing industries in all UNECE subregions consuming more logs in 2013 than they did five years ago. Europe recorded the biggest rise in roundwood production and consumption in 2013 compared with 2012, while roundwood production and consumption increased only slightly in North America.

Much of the higher demand for roundwood was the result of improved sawnwood markets. The production of sawn softwood increased by 3.3% in the UNECE region in 2013 to meet higher demand both in the region and in extra-regional markets such as China, Japan, the Middle East and North Africa.

The trade of logs into and from the UNECE region increased by more than 8% in 2013, with net exports of 27 million m^3. The biggest increases in shipments in 2013 were in US exports of softwood logs to China; softwood log imports to Germany from neighbouring countries; imports of both softwood and hardwood logs to Finland from the Russian Federation; and exports of softwood logs from Norway to Sweden. The major global log trade flow continues to be to China from New Zealand, the Russian Federation and the US, with New Zealand surpassing the Russian Federation in 2013 as the world's largest exporter of softwood logs.

In addition to the removal of industrial roundwood, 194 million m^3 of wood fuel were reportedly produced in the UNECE region in 2013. Most of this was consumed in Europe, which accounted for almost 60% of total wood fuel consumption in the UNECE region.

TABLE 1.5.1

Apparent consumption of industrial roundwood, sawnwood, wood-based panels and paper and paperboard in UNECE region, 2009-2013

							Change 2012-2013		*Change 2009-2013*
	Thousand	*2009*	*2010*	*2011*	*2012*	*2013*	*Volume*	*%*	*%*
Europe									
Industrial roundwood	m^3	341,263	384,946	385,343	374,730	383,288	8,588	2.3	12.3
Sawnwood*	m^3	92,677	102,769	102,232	97,482	95,565	-1,917	2.0	3.1
Wood-based panels	m^3	63,955	65,845	66,217	64,659	65,982	1,323	2.0	3.2
Paper and paperboard	m.t.	88,115	94,371	93,168	89,724	88,562	-1,161	1.3	0.5
CIS									
Industrial roundwood	m^3	100,916	126,271	127,486	173,690	176,513	2,823	1.6	74.9
Sawnwood*	m^3	17,130	17,045	19,024	19,729	21,518	1,789	9.1	25.6
Wood-based panels	m^3	10,531	12,568	16,046	17,852	18,553	701	3.9	76.2
Paper and paperboard	m.t.	8,466	9,363	9,674	9,357	8,868	-489	5.2	4.7
North America									
Industrial roundwood	m^3	398,388	414,253	433,392	426,000	424,102	-1,898	0.4	6.5
Sawnwood*	m^3	81,068	89,332	88,369	91,619	97,394	5,775	6.3	20.1
Wood-based panels	m^3	46,873	47,261	46,254	46,800	49,331	2,530	5.4	5.2
Paper and paperboard	m.t.	78,443	83,266	79,721	73,977	74,247	269	0.4	-5.3
UNECE region									
Industrial roundwood	m^3	840,567	925,470	946,221	974,420	983,903	9,483	1.0	17.1
Sawnwood*	m^3	190,875	209,146	209,625	208,831	214,477	5,647	2.7	12.4
Wood-based panels	m^3	121,358	125,675	128,518	129,311	133,865	4,554	3.5	10.3
Paper and paperboard	m.t.	175,024	185,055	182,563	173,057	171,677	-1,381	0.8	-1.9

Notes: Sawnwood excluding sleepers (also known as railroad ties).
Source: UNECE/FAO TIMBER database, 2014.

Source: UNECE/FAO, 2014.

1.5.2 Sawn softwood

In line with generally improving but unsettled global economic trends, 2013 was characterized by recoveries in North America and the CIS countries and by varying conditions – from unsettled to improving – in Europe. Sawn softwood consumption increased by 5.2% in North America in 2013 due to gains in the housing market, and by 8.8% in the CIS. Europe recorded a 1.7% drop in apparent consumption as some countries continued to struggle economically, but there were production gains in all the UNECE subregions: North America (5.2%); CIS countries (4.0%); and Europe (1.3%).

As European demand for sawn softwood stabilized and overseas exports increased, production in Europe grew slightly – by 1.3% – in 2013, to 97.9 million m^3. This growth was due mainly to increased production in Finland, Romania and Poland, which collectively added 1.3 million m^3 of production. In Europe and the Middle East, sawn softwood prices increased moderately in 2013 compared with 2012, and sawmills were able to push prices up by roughly 3-5%. With reasonable price increases and improved capacity utilization, sawmilling companies with export market exposure were able to improve their profitability. Most European mills made at least some profit in 2013, instead of the losses seen in 2012.

Apparent sawn softwood consumption in the CIS increased by 8.8% in 2013 (to 19.44 million m^3), and production amounted to 35.78 million m^3, an increase of 4.0% over 2012. Fuelled by strong export demand as well as the strength of the euro and the US dollar relative to the rouble at the end of 2013 and early 2014, sawmills increased production and improved price returns by 25% in 2013 compared with 2012. In 2013, Russian exports increased: to China (by 21.5%, to 7.5 million m^3); Uzbekistan (by 28%, to 2.66 million m^3); Azerbaijan (by 16%, to 1.0 million m^3); Tajikistan (by 14%, to 955,000 m^3); and dropped in Egypt (- 21% to 1.37 million m^3).

Apparent sawn softwood consumption increased in North America by 5.2% in 2013, to 80.33 million m^3, due to gains in new residential housing starts and in repairs and remodelling. Apparent sawn softwood consumption increased in the US by 7.1% (to 65.95 million m^3) in 2013, but it declined in Canada by 2.6% (to 14.38 million m^3) due to a general slowdown in the overheated housing market there. US sawn softwood output was 51.05 million m^3 (+4.7%) in 2013, and Canada's output rose at a faster rate (5.8%), to 41.55 million m^3, despite negative domestic market growth.

China has become a key alternative market for producers: in 2013, record exports of sawn softwood were made by Canada (6.8 million m^3), the US (875,000 m^3) and Europe (1.3 million m^3). Extremely bad weather in the eastern half of North America in the first quarter of 2014 and a port strike in Vancouver caused huge logistical issues for sawmills, creating a surplus of lumber and eroding prices in key markets.

The outlook for sawn softwood for the remainder of 2014 is for improving prices in most key markets, including the US, China and Europe, but some markets – such as those of Japan, North Africa and the Middle East – may see prices soften due to excess supply.

1.5.3 Sawn hardwood

There was a significant shift in sawn hardwood trade away from the UNECE region and towards emerging economies during the global financial crisis. This trend slowed in 2013 as demand in the UNECE region began to recover. Total apparent consumption of sawn hardwood in the UNECE region was 31.5 million m^3 in 2013, a 5.1% increase compared with 2012. The increase in consumption in 2013 followed two years of decline and was driven primarily by rising demand in the US.

Sawn hardwood production increased in North America and the CIS in 2013 but declined in Europe, due mainly to log shortages in parts of eastern Europe. The 2012 downturn in imports in the UNECE region continued into 2013, but at a slower pace. After four years of increase, exports in the UNECE region stabilized in 2013.

European consumption and production of sawn hardwood fell by about 4% in 2013, to 12.6 million m^3. Declining consumption was due partly to a lack of supply as hardwood was diverted to more active markets in North America and emerging economies.

Apparent consumption of sawn hardwood increased by 12% in the CIS in 2013, to 2.1 million m^3. Production increased by 2%, to 3.1 million m^3, while exports declined by 11.8%. Imports increased by 12.8% in 2013, but from a very low base. Sawn hardwood consumption increased in the Russian Federation in 2013, driven by rising residential construction. The drop in

exports in the CIS was driven in part by a lack of availability of the most commercially valuable Russian hardwood species exported to China (Mongolian oak and Manchurian ash), the harvests of which have declined in recent years due to over-exploitation.

North American sawn hardwood consumption increased by 11.9% in 2013, to 17.0 million m^3. Low mortgage rates, an improved jobs market and higher consumer confidence bolstered home sales. North American sawn hardwood production increased by 11.4%, to 19.5 million m^3, due to rising domestic consumption and exports. Although US production stepped up again in the first half of 2014, several factors may begin to moderate the pace of growth. Profitability in the hardwood processing sector has fallen because high-margin "grade sawnwood" markets declined more than low-margin "industrial sawnwood" during the global financial crisis. Moreover, the very severe 2013-2014 winter resulted in relatively low inventories of logs in most mills, and supply is also constrained in the short to medium term by a lack of loggers and other infrastructure for harvesting and transporting logs.

1.5.4 Wood-based panels

Despite the mixed economic performance in the UNECE region in 2013, there was moderately strong growth in the consumption of wood-based panels in each of the subregions. North America had the strongest growth (5.4%), driven by the continuing recovery of the housing sector. The consumption of wood-based panels grew in Europe by 2.0%, despite the overall sluggish economy there. The slowdown of the Russian Federation's economy moderated the growth of wood-based panel consumption (+3.9%) there in 2013, although consumption of oriented strand board (OSB) jumped by more than 20%. Across the UNECE region, capacity utilization rates in the wood-based panel sector remain worryingly low, despite increases in both production and consumption. To a large degree, these low capacity utilization rates indicate that, despite recent economic gains, most countries in the region are still recovering from the global financial crisis.

The production of wood-based panels was up by just 1.3% in Europe in 2013, although there were major differences among specific panel products, with plywood production falling by 7.2% and OSB production jumping by 9.9%. Similarly, while overall panel production was up by 3.0% in the CIS in 2013, there was a 4.7% increase in plywood production and a 0.5% decline in medium-density fibreboard. Wood-based panel production showed moderate to strong growth in all product categories in North America in 2013, with the exception of plywood, which grew by a relatively low 1.4%. Overall, capacity utilization rates in the UNECE region remained quite low – below 80% in almost all product categories – in 2013.

Source: UNECE/FAO, 2014.

Europe was the only UNECE subregion to report a trade surplus in wood-based panels in 2013, and this surplus is expected to increase in 2014. Both the CIS and North America reported trade deficits in 2013, and these deficits are projected to carry over into 2014. China remains an influential player in the global trade of wood-based panels, generating 34.3% of global plywood exports and 15.8% of global fibreboard exports. However, timber legality regulations in both the EU and the US could have an impact on imports of tropical hardwood plywood in 2014.

1.5.5 Paper, paperboard and woodpulp

The pulp, paper and paperboard market remained in flux in 2013 as graphic paper capacity continued to be rationalized in Europe and North America – a development that has persisted now for a decade. Chemical market pulp capacity continued to expand in South America, with Southeast Asia being the favoured target market, despite a marked slowdown in investment in new paper and paperboard installations to serve rapidly growing economies. These and other changes are resulting in a possibly unprecedented global shift in pulp and paper supply.

The global pulp, paper and paperboard industry faced another challenging year in 2013. Despite significant capacity closures across several pulp, paper and paperboard grades in Europe, Japan and North America, production capacity is still too high when measured against falling or static demand for some grades. Paper and paperboard production and consumption rose in North America while it fell in Europe. Graphic paper and chemical woodpulp output fell across all UNECE subregions.

Growth in China's gross domestic product slowed to a relatively weak 7% in 2012 (down from 9-10% in 2007-2011). It rebounded to 7.7% in 2013, however, following economic reforms that included stimulating domestic consumption and reducing money supply. As a result, global demand for pulp, paper and paperboard grew slightly in 2013.

Electronic communication via the internet and the use of smart phones continued to play a major role in the evolution of the pulp and paper segments, while paperboard benefited from increased online shopping.

In the pulp sector, expansions in bleached hardwood kraft capacity in South America were by far the most important factor influencing the market in 2013 and through to mid-2014. In the paper sector, the trend of converting production to paperboard and packaging grades continued.

Prices in the pulp sector generally rose in 2013 and into early 2014, but an ever-increasing discount rate continued to hamper the profitability of high-cost producers, leading to capacity rationalization in North America, Europe and even South America.

The production of paper and paperboard weakened in the CIS in 2013. However, significant investments have been made in pulp and paper facilities in the region with an eye to taking advantage of future growth opportunities in both domestic and export markets.

1.5.6 Wood energy

Wood energy markets continued to grow in the UNECE region in 2013. Although wood energy consumption in the industrial sector declined slightly, residential and power-sector demand expanded. Considerable growth in wood energy consumption is about to occur in Europe and the CIS, driven partly by renewable energy targets (in the EU) and improvements in the investment climate (in the CIS).

The EU is – and will continue to be – the world's largest market for pelletized wood energy. New growth in demand may occur in Belgium, the Netherlands and the UK. New and excess production capacity in Canada, the CIS, southeastern Europe and the US should be able to match the growing demand.

New markets in Asia will also increase the consumption of wood energy and could eventually create price pressures in the global wood energy market. There are signs of excess capacity in wood-pellet manufacturing in North America and southeastern Europe, although investment in new plants continues to grow.

A key issue for the further development of wood-pellet trading appears to be pending requirements for the certification of the forests and wood used in pellet production. Clear regulations about financial support for renewable energy projects and renewable energy mandates will be a driving force for new investment in wood energy. Public policy debate on targets beyond 2020 will also affect developments and spur or limit investments, primarily in power generation projects.

The top-five wood energy producers in the EU are Germany (15.0%), France (11.4%), Sweden (10.5%), Finland (9.7%) and Poland (8.1%). The latest data from the Joint Wood Energy Enquiry[4] (JWEE) show that the residential sector leads wood energy use in Europe (41% of total consumption), followed by industry (29%) and the power-and-heat sector (28%). The use of wood energy continues to grow in the power-and-heat sector.

Wood pellets dominate trade with the EU27[5] in wood energy feedstock. The US was the main exporter of wood pellets to the EU27 in 2012, followed by Canada and the Russian Federation. Total wood-pellet imports into the EU27 from Canada, the Russian Federation, the US and the rest of the world reached 4.5 million tonnes in 2012. Nevertheless, trade within the EU27 was larger, at about 4.7 million tonnes in 2012 of wood pellets.

The Russian Federation's domestic consumption of different kinds of wood energy for heat production is growing, including the use of sawmill co-products, firewood, wood briquettes and pellets. Russian wood-pellet production is reported to have increased by about 50% and may have reached 1.5 million tonnes in 2012. An estimated 96% of production was exported. Wood briquette production rose by 20% to approximately 300,000 tonnes, of which approximately 40% was sold domestically in 2012.

An increasing trend in foreign investment in wood-pellet manufacturing and combined-heat-and-power plants in the Russian Federation reflects growing confidence in energy markets.

Growth of wood energy production in Canada will continue to be linked to exports of wood pellets. Projections for the US show growth in wood energy use to 2030, but at a lower rate than previously forecast. Canada had 49 wood-pellet plants in May 2013, with an estimated capacity of 3.4 million tonnes. A number of other facilities are in the planning phase, potentially increasing as much as 2 million tonnes of capacity.

According to Biomass Magazine, wood-pellet production capacity in the US amounts to 8.2 million tonnes, and planned capacity is close to 15 million tonnes. Actual wood-pellet production is estimated at 1.7 million tonnes in Canada and 4.0 million tonnes in the US.

1.5.7 Value-added wood products

The value of global furniture production, most of which is wooden, was an estimated $437 billion in 2013, and China was by far the largest furniture-manufacturing country. Furniture trade continues to grow faster than consumption as manufacturing moves to lower-cost countries.

In 2013, markets for builders' joinery and carpentry continued to recover in the US, the UK and Germany and to decline in France. These markets are characteristically regional, with most imports originating close-by. The exception is the US market, which Asian producers have penetrated strongly.

The profiled-wood market continues to recover in the US, fuelled by strengthening housing markets. Imports of profiled wood are growing steadily, with Brazil the largest exporter in the softwood mouldings market (36% of market share), followed by Chile (31%) and Canada (11%). European profiled-wood markets continue to stagnate.

[4] www.unece.org/forests/jwee.html

[5] The EU27 was used rather than the EU28 in order to directly compare developments between 2012 and 2013 datasets, as Croatia (the 28th country to enter the EU) did not join the EU until 1 July 2013.

Global laminate flooring production increased from 890 million m^2 in 2012 to 925 million m^2 in 2013. China produced 28% of global laminate flooring in 2012, replacing Germany (27% in 2012) as the main producer of this product; Germany's share declined further, to 26%, in 2013.

Source: APA, 2013.

For the purposes of this publication, engineered wood products comprise: glue laminated beams (glulam), laminated veneer lumber (LVL), wooden I-beams, finger-jointed timber and cross laminated timber (CLT) (and a few other relatively minor products). Most markets for engineered wood products are stagnant in Europe. The exception is CLT: the production and consumption of this product has grown impressively and is expected to be at well over 10% per year for the foreseeable future.

In contrast to Europe, the production of engineered wood products is increasing in North America, with most products experiencing 10-20% growth in 2013. CLT is now being produced in North America but is yet to make serious inroads into building construction there. Currently, the mining and oilfield industries consume a large percentage of the CLT produced in North America for use as equipment pads and platforms.

Engineered wood products have made inroads into areas where concrete and steel formerly were used exclusively. Builders of bridges and large buildings (such as apartment complexes and sports venues), for example, are now considering wood for its natural beauty as well as its utility, cost-effectiveness and environmental credentials.

Building codes and construction regulations are slowly being amended to accommodate wood based on its performance, moving away from prescriptive standards which stipulate the materials that may be used. In addition, many governments are actively encouraging the use of wood. These developments could all be beneficial for the use of engineered wood products in the future.

1.5.8 Housing

In most of the eurozone (Germany being the exception), a robust housing recovery is being delayed by several economic factors. Several analysts believe that the value of new residential construction in Europe will increase through 2016, from €232.13 billion in 2014 to €251.47 billion in 2016.

In North America, the US housing market is still in the early stages of recovery, although housing starts and new house sales are still at the lowest levels recorded since 1963. Spending on private residential construction (single- and multi-family housing) continues to improve, but remodelling is decreasing slightly, as are public expenditures. Several housing analysts project that a robust US housing recovery remains several years away. The Canadian housing market is considered stable.

There were record housing completions in the Russian Federation in 2013. A total of 912,100 new dwellings were built, an increase of 10.3% over the previous year and the largest number of new dwellings for more than 20 years. Residential space construction totalled 69.4 million m^2 in 2013, an increase of 5.6% over 2012.

In the first quarter of 2014, 178,000 apartments were commissioned in the Russian Federation, with a total area of 13.6 million m^2. This is nearly 31% greater than commissioned in the 2013 time-period, when 10.4 million m^2 was commissioned. In the first quarter of 2014, individual developers built 47,600 residential houses with a total area of 6.4 million m^2, an increase of 19.2% over the same period in 2013.

2 POLICIES SHAPING FOREST PRODUCTS MARKETS

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HIGHLIGHTS

- In September 2013, the European Commission adopted the European Forest Strategy to address changes and increasing demands affecting the forest sector as well as the diversity of policies and directives, which had created a fragmented forest policy framework.
- Negotiations between the EU and the US on a trade agreement called the Transatlantic Trade and Investment Partnership began in July 2013 and are expected to continue through 2014. The proposed agreement has the potential to reduce trade barriers between the two trading blocs.
- 2013 marked the tenth anniversary of the adoption of the EU's Forest Law Enforcement, Governance and Trade Action Plan. A key output of the Plan is the creation of voluntary partnership agreements (VPAs) between the EU and tropical timber-supplying countries. As of May 2014, VPAs had been signed with six countries – Cameroon, the Central African Republic, the Republic of the Congo, Ghana, Indonesia and Liberia.
- The global area of certified forests remained at 10.7% of the total forest area in 2013. It is estimated that about 30% of total global roundwood production originates from certified forest areas.
- In the first quarter of 2014, a record 2.8 billion European carbon allowances (EUAs) were traded on Europe's four main emissions exchanges, up 12% from the same period in 2013. Trading surged despite a cut in supply; primary EUAs were priced at €5.55 ($7.56) per tonne of CO_2 (tCO_2).
- The global voluntary carbon market value fell to $379 million in 2013, a 26% drop in tonnes traded compared with 2012. Demand for voluntary offsets dropped in 2013, along with average prices (to $4.90/$tCO_2$ marketwide). This can be partly explained by the introduction of California state's cap-and-trade regulation, which requires all covered entities to register through the Air Resources Board, which is a compliance-based market (thus moving a large volume of trade from voluntary to compliance markets).
- The US Green Building Council approved version 4 of the Leadership in Energy and Environmental Design (LEED) green building standard in June 2013. In the Materials and Resources section of this version, prescriptive measures have been replaced with credits related to lifecycle analysis (LCA), LCA-based environmental product declarations (EPDs), material ingredients verification, and raw-material extraction..

2.1 INTRODUCTION

Policies related to wood and forest product markets determine how, when and where wood is used as a material in building, energy and economic development. Continued efforts to assert the credentials of wood as an environmentally preferable material are essential, as are research and other efforts to address potential policy shortcomings.

The new EU Forest Strategy, adopted on 20 September 2013, responds to challenges facing the forest sector and key policy developments in the EU. Such policy developments include Europe 2020 (a strategy for growth and jobs); the Resource Efficiency Roadmap; the Rural Development Policy; the Industrial Policy; the Climate and Energy Package with its 2020 targets; the Plant Health and Reproductive Materials Strategy; and the Biodiversity and Bioeconomy strategies (European Commission, 2013a).

2.2 TRADE-RELATED

2.2.1 Transatlantic free trade

The Transatlantic Trade and Investment Partnership (TTIP) trade agreement is under negotiation between the EU and the US. The goal of the TTIP is to remove trade barriers from a wide range of economic sectors and to make it easier to trade goods and services between the two trading blocs. Negotiations began in July 2013 and are expected to continue through 2014. An independent economic assessment, released by the European Commission, estimated that economic gains from a transatlantic trade agreement could be significant: the EU economy could be boosted by €119 billion ($159 billion) per year and the US economy by €95 billion ($127 billion), and global income could increase by €100 billion ($133 billion) (Francois, 2013).

2.2.2 US and Canada forest trade and policy

The Softwood Lumber Agreement between Canada and the US was extended in January 2012 and is to remain in place until 12 October 2015. In March 2014, the London Court of International Arbitration concluded that Canada's obligation to adjust export taxes under the Softwood Lumber Agreement terminated on 12 October 2013, the original termination date of the agreement (Kaufmann-Kohler et al., 2014). Exporters who paid adjusted taxes after that date may be entitled to reimbursement.

Also related to Canada's forest policy is the Canadian Boreal Forest Agreement (CBFA), which addresses sustainable forest management practices and applies to more than 73 million ha of forestland. The CBFA came into effect in May 2010 and expired on 18 May 2013. An amended CBFA has been established since, involving seven environmental organizations (two fewer than in the previous agreement), the Forest Products Association of Canada and its 18 member companies, and Kruger Inc. (CBFA, 2014).

Source: FAO/UNECE, 2014.

2.2.3 Russian forest trade and policy

The Government of the Russian Federation confirmed its National Forest Policy in late 2013 (Federal Forestry Agency, 2014), and moved forward with bioenergy developments, and simplified procedures for exporting roundwood timber. The simplified procedures include fundamental changes to the rules for the allocation of tariff quotas on the export of spruce, pine and fir roundwood (Russian Gazette, 2013a). The new scheme allows applicants to obtain licences to export coniferous roundwood from the Russian Federation, even if they have no rights to harvest timber (i.e. if they buy roundwood from those with harvest rights). The government also established a system for accounting and regulation of roundwood trade (Russian Gazette, 2013b).

In September 2013, the Government of the Russian Federation adopted Principles of State Policy for the Use, Protection and Reproduction of Forests in the Russian Federation covering the period up until 2030 (Russian Gazette, 2014). The government also approved a plan to reduce greenhouse gas emissions to no more than 75% of 1990 levels by 2020 (Government of the Russian Federation, 2014). In April 2014, the government approved Decree 504-p, which includes measures to meet the country's greenhouse gas emission reduction targets. It is possible that a carbon-pricing scheme could also result from this decision.

The development of bioenergy businesses in the Russian Federation is being hampered by high railway tariffs for the transport of wood pellets. On the other hand, the bioenergy

sector may be boosted by the intention, stated in February 2014, of the government to support loans in 2014-2016 for the creation of new industries using industrial biotechnology (Russian Gazette, 2014). The expected level of subsidies is 250 million roubles per year (about $7 million) for 2014-2016

2.2.4 Due diligence and legal wood supply

Governments, forest product companies, landowners and other stakeholders have made the prevention of illegal logging a priority. Due-diligence systems and methods for verifying legal wood supplies have developed in the private sector, encouraged by regulation and government action. Emerging technologies such as forensic methods, remote sensing and DNA analysis can aid in verifying the origin of wood and wood products (WWF, 2014). A key output of the EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan, which marked its tenth anniversary in 2013, is the signing of voluntary partnership agreements (VPAs) between the EU and tropical timber-supplying countries. By May 2014, six exporting countries had signed VPAs – Cameroon, the Central African Republic, the Republic of the Congo, Ghana, Indonesia and Liberia. VPAs engage partner countries in the development of legality assurance systems for timber exported to the EU. Ghana and Indonesia are expected to deliver the first FLEGT-licensed timber to the EU in early 2015. In addition to VPAs, the EU is implementing FLEGT principles in China through the Bilateral Coordination Mechanism (BCM). In 2014, BCM work is focusing on the analysis of timber flows, investments by China in countries implementing VPAs, and the development of guidelines for sustainable international forestry trade and investment by Chinese enterprises (EU FLEGT Facility, 2014).

The VPAs between the EU and exporting countries have provisions for independent auditing. Stakeholders have expressed concern about the thoroughness of the auditing provisions and suggest that additional independent monitoring may be necessary to ensure credibility (Brack and Leger, 2013). This suggestion is consistent with the European Commission's position that third-party forest certification systems alone are insufficient to provide legality in the due-diligence systems of EU importers.

In addition to supply-side initiatives to improve forest governance, the EU is implementing demand-side measures through the EU Timber Regulation (EUTR). While some EU member states began active EUTR enforcement measures in 2013, others only began introducing these in 2014. EU countries are now concentrating on building the capacity and knowledge needed to provide advice and pursue successful prosecutions under the EUTR (ETTF, 2014). A review of the implementation of the EUTR is planned for 2015 and will include a stakeholder consultation process.

A report published by the European Commission has assessed the impact on deforestation of EU consumption of all products and services, not just those derived directly from forest management. The report attributed 200,000 ha of the total global deforestation between 1990 and 2008 (232 million ha) to the EU's imports of wood products, and 8.7 million ha to EU imports of agricultural cash crops and livestock products. The report also estimated that, worldwide, 33% of the deforestation embodied in crops and 8% of the deforestation embodied in livestock products enter international markets. This implies that policy measures targeting the consumption of agricultural commodities would be at least as effective in reducing deforestation as those targeting timber products (European Commission, 2013b).

The Global Timber Forum[6] (GTF) was launched in 2013 with the aim of creating a new communications hub for timber trade federations and national and regional umbrella bodies worldwide. At the GTF's inaugural meeting in Rome in May 2013, it was agreed that the GTF would focus on four key themes:

- communicating the economic sustainability of timber use and the role of sustainable timber production in maintaining forests;
- meeting market legality requirements;
- promoting wood products; and
- realizing new opportunities, particularly in green building.

2.2.5 Lacey Act

The US Lacey Act, which was passed into law in 1900, addresses trafficking in wildlife, fish and plants that have been illegally taken, possessed, transported or sold. After a series of amendments in 2008, the Act requires that import declarations accompany certain plants and plant products, including a wide range of wood and forest products (USDA, 2012). The amendment provisions require increased due diligence by businesses that source and sell wood and wood products (Beveridge and Diamond, 2009).

Following resolution of the "Gibson guitar" case in 2012 (US Department of Justice, 2012), a new dispute arose affecting a US based flooring company. In September 2013, company offices were raided, based on allegations of links to illegal logging activities. Following the raid, lawsuits were filed alleging the sale of products sourced from endangered habitats. (Connolly, 2014).

Amendments to the Lacey Act continue to be debated in the US Congress. Among these are the Lacey Act Clarifying Amendments Act (HR 3280) and the Lacey Act Paperwork Reduction Act (HR 3324) (House Committee, 2014).

[6] http://gtf-info.com/

2.3 ENERGY-RELATED

2.3.1 Ethanol and liquid fuels

A July 2013 report commissioned by the European Commission predicted that biodiesel would comprise 6.6%, and bioethanol 2.2%, of road transport energy by 2020 (Kampman et al., 2013). The report concluded that it is very unlikely that the biofuel targets of EU member states will be achieved given current limitations and policies. The overall target for renewable energy in the transport sector is 10% by 2020, as adopted in 2009 in the EU Renewable Energy Directive. New biofuel standards, innovations in vehicle technologies, and the stabilization of long-term biofuel strategies and policies may be needed in order to meet the goals.

2.3.2 Biomass

EU member states are collectively under a legal obligation to more than double total renewable energy generation from the level of 2005, by 2020. In some countries, notably the United Kingdom, projects are underway to generate more electricity in biomass-fuelled power plants. A study for the European Commission projected that demand for wood-based material will overshoot current production levels by 60 million m^3 per year by 2016, primarily due to rising demand for biomass (Indufor, 2013). However, given that only 60-70% of Europe's annual wood increment (growth) is currently being harvested, there remains considerable scope for meeting demand for woody biomass sustainably (European Commission, 2013a). In order to succeed, steps will be required to increase forest utilization, implement resource-efficient use of wood (e.g. cascaded[7] wood use), mobilize more woody and agricultural residues, recycle more paper, and re-use more post-consumer wood (IINAS et al., 2014).

Current EU and member-state energy and climate policies are not conducive to efforts to maximize the potential of woody biomass. Bioenergy, forest and waste policies are fragmented and unaligned, and incentive schemes do not consider the overall greenhouse gas emissions arising from bioenergy. Progress is being made, however, to increase the resource-efficient, cascaded use of wood in Europe. Indufor (2013) calculated a "cascade factor" for Europe, which it defined as the overall use of wood raw material divided by its roundwood component; the cascade factor is a measure of the extent to which the European wood-processing industry has succeeded in increasing the utilization of wood co-products and recycled fibres. The EU27 cascade factor[8] increased from 1.96 in 2000 to 2.07 in 2011 and is projected to increase to 2.10 in 2016 (Indufor, 2013).

Several reports have stirred public debate in Europe about the real carbon benefits of wood biomass, particularly the potential "carbon debt" that may arise due to the time delay between burning wood in power stations and the regeneration of an equivalent volume of wood in the forest (Royal Society for Protection of Birds et al., 2013). Greenhouse gas emissions from woody bioenergy are small when burned efficiently compared with emissions from fossil fuels, and "carbon debt" becomes insignificant if: wood is produced sustainably; there is cascaded use; and the total energy system is considered (IINAS et al., 2014).

A new International Organization for Standardization (ISO) standard within the ISO 17225 series for solid biomass fuels was published in April 2014 (ISO, 2014). Although US and EU standards have been in place for several years, the new ISO standard could support the trade of solid biofuels internationally. The standard defines the fuel qualities and resource types (e.g. forest, agriculture, horticulture and aquaculture) and includes pellet grades for non-industrial and industrial uses.

EU countries producing energy from biomass follow the sustainability criteria in the Renewable Energy Directive, and some countries, including the United Kingdom, have developed their own additional criteria. The European Commission is expected to issue a sustainability framework for solid biomass in late 2014, and it has also recognized a number of voluntary schemes that provide sustainability criteria for biofuels, such as Ensus; Greenergy; Abengoa RED Bioenergy Sustainability Assurance; the Biomass Biofuels voluntary scheme; Bonsucro EU; and International Sustainability & Carbon Certification.

2.4 ENVIRONMENT-RELATED

2.4.1 Certified forest products

Forest certification is now well-established and understood in Europe, with broad market recognition for timber certified to either Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC) standards. A high proportion of forest products produced and imported into many European countries are from FSC- or PEFC-certified forests (TTAP, 2013). Key policy issues on forest certification include:

- The interaction between forest certification and legality due-diligence systems following the introduction of the EUTR;
- Increasing participation in certification by smaller enterprises and forest owners;
- introducing robust and innovative procedures to reduce the misuse of paper-based claims; and
- Reducing bottlenecks in certification supply chains, i.e. lessen the need to stock higher inventories because of limited possibilities for mixing sustainability labels.

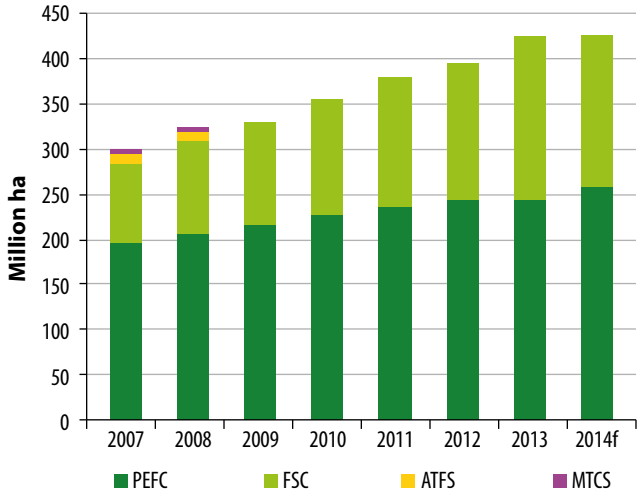
In May 2014, the FSC and the PEFC reported a total combined certified area of 440.3 million ha globally (graph 2.4.1). The total certified area grew by 3.8% (16 million ha) between May 2013 and May 2014, which is half the growth that occurred in the previous 12 months.

[7] The principle of cascaded use is that the same biogenic resources are used sequentially: first (and possibly repeatedly) for material applications and then for subsequent energy applications.

[8] The overall use of wood raw material divided by its roundwood components.

GRAPH 2.4.1

Cumulative forest area certified by major certification schemes, 2007-2014



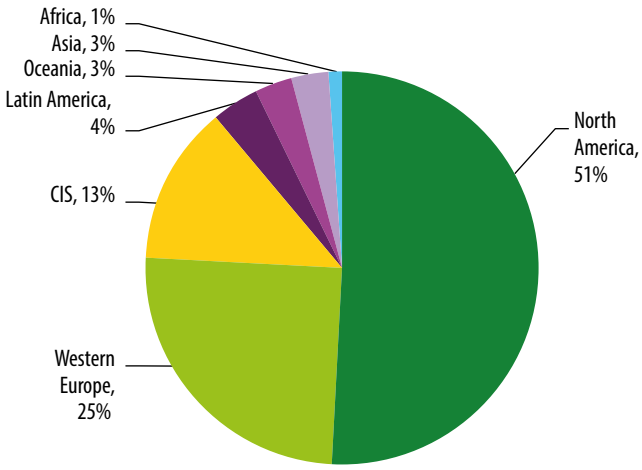
Notes: f=forecast. Data cover all FSC- and PEFC-certified forestland as well as land certified under two national certification schemes, the Malaysian Timber Certification System (MTCS) and the American Tree Farm System (ATFS). Since 2009, data for national schemes subsequently endorsed by the PEFC have been amalgamated into the PEFC. The shown data do not reflect an estimated overlap of roughly 7.5 million ha (as of May 2014).
Sources: FSC, 2014a; PEFC, 2014d.

The global area of FSC-certified forest increased by 2.7 million ha (a 1.5% rise), and the area of PEFC-certified forest increased by 13.5 million ha (a 5.5% rise). As of May 2014, the PEFC had endorsed 258 million ha of certified forest in 28 countries and the FSC had certified 182 million ha in 81 countries (graph 2.4.1).

There is an overlap in the two schemes, estimated at 7.5 million ha (these are forests that are certified by both the FSC and PEFC). More than two-thirds of this "double" certification is in Europe (3.5 million ha) and North America (2.6 million ha). Taking double certification into account, the world's total certified forest area accounts for about 10.7% of the total global forest area of 4.03 billion ha.

GRAPH 2.4.2

Regional share of total certified forest area, May 2014

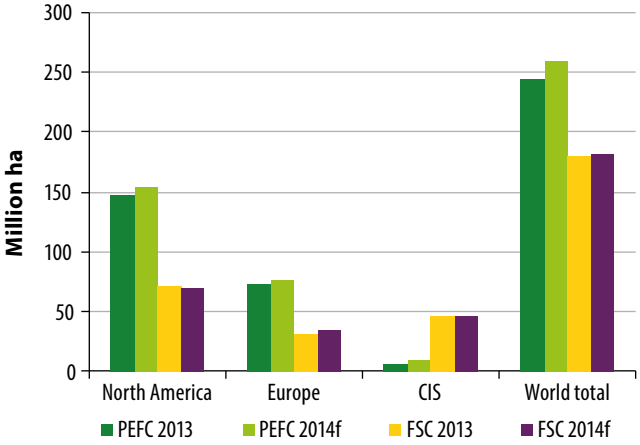


Sources: FSC, 2014a; PEFC Council, 2014d.

More than 80% of the globally certified forest area is in the UNECE region (graph 2.4.2). To enable the possible inclusion of certification schemes in REDD+[9] (e.g. to ensure sustainable forest management and monitor illegal logging), certification frameworks and incentives that are more effective in other regions may be needed. Graph 2.4.3 shows how the certified forest area of the two major certification schemes is divided among the CIS, Europe and North America.

GRAPH 2.4.3

Certified forest area by region and certification scheme, 2013-2014



Note: f=forecast.
Sources: FSC, 2014a; PEFC Council, 2014d.

Western Europe (6.4 million ha) and North America (5.6 million ha) made the highest gains in certified forest area between 2013 and 2014, while Asia recorded the largest relative increase (12.4%) (table 2.4.1). Africa is the only region in which the area of certified forest declined (by 1.1 million ha, or 14%).

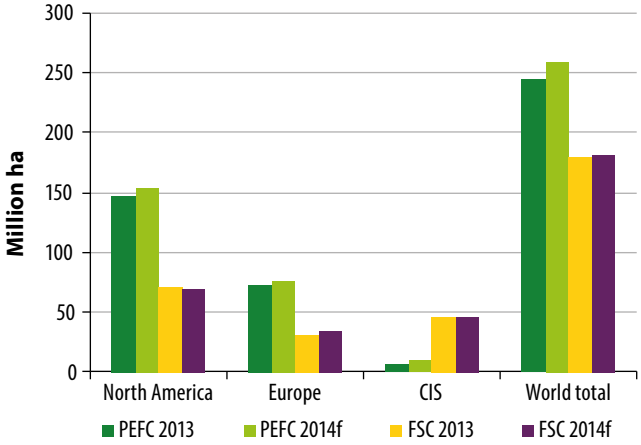
Estimated industrial roundwood production from certified forests increased by 20-30 million m^3 per year between May 2011 and May 2014, reaching 524 million m^3 (table 2.4.1). Given that global roundwood production in 2013 was 1.7 billion m^3 (FAOSTAT 2014), about 30% of the global production originated in certified forest in that year. The number of active chain-of-custody (CoC) certificates increased by 6% between May 2013 and May 2014 (FSC issued an additional 1,820 certificates in that period and PEFC an additional 328 certificates), bringing the total number of active CoC certificates worldwide to 37,838 (graph 2.4.4). This compares with an increase of 12% between May 2012 and May 2013.

The process of developing the FSC's International Generic Indicators (IGIs) has moved forward, with a first draft of documents released in 2013 and a second draft released in January 2014. Countries with existing FSC standards are expected to transition to the new system (i.e. complete the FSC Transfer Process) by December 2015 (FSC, 2014b).

[9] REDD+ is the term given to Reducing Emissions from Deforestation and forest Degradation, including the role of conservation, sustainable management of forests and enhancement of forest carbon stocks

GRAPH 2.4.4

Chain-of-custody certificates issued worldwide, 2007-2014



Note: f=forecast.
Sources: FSC, 2014a; PEFC Council, 2014d.

In May 2013, the FSC announced a decision to dissociate from the Danzer Group, including the termination of all contractual relationships such as trademark agreements and forest management certificates. In 2014, the Danzer Group re-associated with the FSC. The decision to dissociate had affected FSC certificates held in China, the Republic of the Congo, Switzerland, the US and the United Kingdom (FSC, 2014c). In February 2014, a certification violation by Swedwood, a subsidiary of IKEA, resulted in the suspension of its certification and of operations in the Karelia forest in northwestern Russian Federation (Daily Mail, 2014). The certificate was reinstated in March 2014 following an independent review of the audit findings (Rainforest Alliance, 2014).

In North America, the Sustainable Forestry Initiative (SFI) began its five-year standards review cycle in 2013. The new 2015-2019 standard has a scheduled launch date of 1 January 2015 (SFI, 2014). Revisions to the SFI standard are expected to include new performance measures to address biodiversity protection, rights for indigenous peoples, and an expanded definition of "controversial sources" that are not allowed in SFI-labelled products.

In May 2014 it was announced that Canada's National Standard on Sustainable Forest Management, CAN/CSA-Z809, would undergo revision. Periodic revision is a required element of PEFC endorsement to ensure that standards continue to reflect the latest knowledge, best practices and policy and market requirements (PEFC, 2014a).

Source: J Martin, 2014.

TABLE 2.4.1

Potential global and regional supply of industrial roundwood from certified resources, 2012-2014

	Total forest area (million ha)	*Certified forest area (million ha)*			*Certified forest area (%)*			*Estimated industrial roundwood from certified forest (million m^3)*			*Estimated proportion of Industrial roundwood production from certified forests (%)*		
		2012	*2013*	*2014*	*2012*	*2013*	*2014*	*2012*	*2013*	*2014*	*2012*	*2013*	*2014*
North America	614.2	198.0	215.8	221.3	32.2	35.1	36.0	224.0	244.2	250.5	12.7	13.8	14.1
Western Europe	168.1	95.4	100.2	106.6	56.7	59.6	63.4	224.7	236.1	251.1	12.7	13.3	14.2
CIS	836.9	47.5	53.4	55.5	5.7	6.4	6.6	9.1	10.2	10.6	0.5	0.6	0.6
Oceania	191.4	13.2	11.9	12.6	6.9	6.2	6.6	3.8	3.4	3.6	0.2	0.2	0.2
Africa	674.4	7.3	7.5	6.4	1.1	1.1	1.0	0.8	2.2	1.9	0.0	0.1	0.1
Latin America	955.6	14.7	15.7	16.3	1.5	1.5	1.7	2.9	1.2	1.2	0.2	0.1	0.1
Asia	592.5	9.5	12.5	14.1	1.6	1.6	2.4	3.2	4.0	4.5	0.2	0.2	0.3
World total	4,033.1	385.6	417.0	432.8	9.6	10.3	10.7	468.5	501.3	523.4	26.5	28.3	29.6

Notes: Estimates of forest area (excluding "other wooded land") and industrial roundwood production from certified forests are based on data from FAO (2010). For the latter, annual roundwood production from "forests available for wood supply" in each region or subregion has been multiplied by the percentage of the region's or subregion's certified forest area (i.e. it is assumed that the volume of industrial roundwood removed from each hectare of certified forest is the same as the average for all forest available for wood supply). However, not all certified roundwood is sold with a label. "2013" covers May 2012-May 2013, and "2011" and "2012" are also from May to May.
Sources: FAO, 2010; FSC, 2014a; PEFC, 2014d; Canadian Sustainable Forestry Certification Coalition, 2014.

In March 2014, the PEFC announced its endorsement of China's National Forest Certification System. China's certification programme currently covers about 2 million ha of forest. The PEFC has also endorsed a national certification system in Malaysia and is assessing an application from the Indonesian Forestry Certification Cooperation (PEFC, 2014b). A standards development process has been initiated in Cameroon (PEFC, 2014c).

2.4.2 Carbon-related

In May 2013, the atmospheric concentration of CO_2 surpassed 400 parts per million for the first time in recorded history. At the 19th Conference of the Parties to the United Nations Framework Convention on Climate Change ("UNFCCC COP 19"), held in Warsaw, Poland, governments took steps towards a new universal agreement to limit global temperature rise to 2 °C. Thirty-nine national and 23 subnational jurisdictions now have carbon-pricing instruments, emissions trading schemes or taxes, either enacted or in process.

The main carbon market, the EU Emissions Trading System, is still marked by uncertainty about its cost-efficiency and impact. The recent growth in the market's oversupply, and the subsequent drop in carbon price, have affected the scheme's ability to reduce emissions, leading to a decision to implement so-called backloading (i.e. delaying new auctions of EU allowances – EUAs). In the first quarter of 2014, a record 2.8 billion EUAs were traded in Europe's four main emissions exchanges, an increase of 12% over the same quarter in 2013. The surge in activity occurred despite a cut in supply. The price of primary EUAs was €5.55 ($7.56) per tonne of CO_2 (tCO_2) on 17 June 2014.

By the end of 2012, the challenges of the Clean Development Mechanism (CDM) had become acute, with oversupply soaring and prices tumbling. One hundred and fifty-five new CDM projects (none in forestry) were registered in the period January 2013 to June 2014, bringing the total number of registered CDM projects to 7,516. Only four new Joint Implementation (JI) projects were registered between June 2013 and May 2014 in the JI planning stage, none of them in forestry. In the same period, a total of 122.5 million certified emission reductions were issued in the CDM and 68.1 million emission reduction units were issued in JI.

Demand for voluntary offsets dropped in 2013, along with average prices ($4.90/$tCO_2$ marketwide), and the total value of the voluntary carbon market shrank to 76 million tCO_2 of carbon offsets for immediate or future delivery. The global voluntary carbon market value fell to $379 million in 2013 (a 26% drop by volume, from 102.8 to 76 million tCO_2), partly due to the launch of the US state of California's compliance-based market. This moved traded volume from voluntary- to compliance-based markets.

Forestry remains the most popular offset category in the voluntary carbon market. Voluntary carbon market demand for offsets from afforestation and reforestation (A/R) projects has outpaced demand for other forest carbon project activities. In 2013, A/R activities linked to REDD+ activities were the most widely transacted forest offset type. Transaction volumes in REDD+ projects increased by more than 50% in 2013, to 22.6 million tonnes CO_2 equivalent. The market value of REDD+ projects also increased by 35% compared with 2012, to $94 million.

Voluntary business offsets were a key driver of forest carbon offset purchases in 2013, motivated mainly by corporate social responsibility commitments. Market growth was supported strongly by a significant transaction between the German Development Bank KfW (Kreditanstalt für Wiederaufbau), and Brazil's Acre state.

The most significant forestry outcome of UNFCCC COP 19[10] was the Warsaw Framework for REDD+. This set of seven decisions aims to provide clear guidance to parties developing national REDD+ programmes. The decisions were on:

1) Addressing the drivers of deforestation and forest degradation;
2) Creating a work programme on results-based finance;
3) Methods for measuring, reporting and verifying;
4) Methods for national forest monitoring systems;
5) Coordinating support for the implementation by developing countries of mitigation actions in the forest sector, including institutional arrangements;
6) Guidelines and procedures for the technical assessment of submissions from parties on proposed forest reference emission levels and/or forest reference levels; and
7) The timing and frequency of presentations of information summaries on how safeguards are being addressed and respected.

Most necessary elements are now in place to enable countries to access performance-based payments under a REDD+ mechanism (RECOFTC/FAO, 2014).

2.4.3 Green building

Increasingly, building and construction are affected by green-building objectives. The prominence of wood in green building largely depends on technical norms and the incentives available for wood use in green-building standards and building codes.

The European Construction Products Regulation came into force across the EU in July 2013. The regulation introduced legal requirements for the sustainable use of natural resources in the EU building sector. It states that construction must be designed, built and demolished in such a way that the use of natural resources is sustainable. In particular it requires: the re-use or recyclability of materials and parts after demolition; durability; and the use of environmentally compatible raw and secondary materials (Anderson, 2014).

Research is ongoing on the carbon and climate benefits associated with the expanded use of wood building systems. Studies in Germany, for example, have explored the potential benefits of the expanded use of wood construction in homes and residential structures. In 1991, only about 8% of private dwellings in Germany were built primarily with wood; today, this percentage has increased to 15%, and it is estimated that the percentage could rise as high as 40% (Wegener and Pahler, 2011). Potential benefits from the increased use of wood in construction include:

- increased carbon storage in structures;
- avoidance of emissions associated with the manufacture and use of non-wood building materials;
- energy and emissions' savings due to improved building performance and energy efficiency; and
- energy gains in re-use and energy-capture methods for end-of-life handling and disposal.

Wegener and Pahler (2011) estimated that a modern detached timber house contains as much carbon (CO_2 equivalent) as would be emitted by a car over 40 years (assuming emissions of 120 g of CO_2/km and annual usage of 11,400 km).

In the US, an estimated 80% of private dwellings are built primarily with wood. Therefore, efforts to expand wood construction in the US have focused on increasing the use of wood in non-residential, commercial and government construction projects.

In March 2014, the US Department of Agriculture announced support for advanced wood-building materials and efforts to design and build high-rise wood demonstration projects (USDA, 2014), in line with the White House's Climate Action Plan. The US National Climate Assessment released in May 2014 reported that US forest ecosystems, and the associated wood products industry, capture and store approximately 16% of annual US CO_2 emissions (Melillo et al., 2014).

Source: FAO/UNECE, 2014.

2.4.4 Green building programmes and code development

LEED® ("Leadership in Energy and Environmental Design") is a building rating and certification programme developed by the US Green Building Council (USGBC). LEED provides third-party verification that a structure has been designed and built in accordance with specified practices and performance measures within specific categories. Adherence to required elements and numerical scores across all categories are used in determining

[10] United Nations Framework Convention on Climate Change, Conference of the Parties 19 is the 19th annual meeting when world governments negotiate climate change initiatives and policies.

an overall project rating. Established in 2000, LEED has certified about 15,000 buildings globally.

In June 2013, the membership of the USGBC approved version 4 (v4) of LEED. The revised standard moves away from a prescriptive basis for green building and toward a performance basis, with a greater emphasis on the end use of systematic life cycle analysis (LCA)-based tools and information sources. The revised standard allows the simultaneous, science-based consideration of multiple attributes rather than adherence to intuition-based single attributes. Prescriptive measures were part of the previous version of the system for materials' re-use, recycled content and rapidly renewable materials. These have been replaced in the Materials and Resources section of LEED v4 with credits related to LCA, LCA-based environmental product declarations (EPDs), material ingredients verification, and raw-material extraction. LCA and LCA-based tools point to the many environmental advantages of wood and the increasing array of engineered wood products. Low embodied energy[11], an already apparent advantage of wood buildings, will become increasingly important as new building techniques and technologies create energy efficiency gains and these are translated into reductions in operating energy. The importance of the low carbon emissions associated with wood production, and of wood's ability to store significant amounts of carbon, will also increase.

In November 2013, the US Government modified its stance on green building to adopt a policy that accommodates the use of more diverse programmes. This is generally seen as a positive step for integrating wood products into federal building projects.

2.4.5 Environmental product declarations

In September 2013, the ECO Platform was officially launched as an EU initiative to address sustainability in the construction products industry. The ECO Platform aims to ensure compliance with the new EU Construction Product Directive and standard (EN 15804). The harmonized standard EN 15804 applies to the end use of Life Cycle Analysis (LCA) and the preparation of EPDs in the construction sector and provides a common framework for implementation throughout the EU. In practice, however, it is the responsibility of EU member states to introduce regulations and programmes to ensure that requirements are met. By May 2014 several EU countries had introduced specific measures. The Netherlands requires building LCAs for all new homes and offices over 100 m^2. France will require that all environmental claims about construction products are supported by EPDs from July 2014, and those EPDs will need to be verified independently after 2017. In Germany, all new government building is subject to a requirement for a building-level LCA (Anderson, 2014). In the United Kingdom, the Green Construction Board Routemap proposes mandatory EPDs for all construction products. Moreover, publicly available carbon footprints information should become compulsory for all public buildings from 2017 as a key element of a government strategy to achieve a 21% reduction in 2010 embodied carbon by 2022 (Green Construction Board, 2013).

The timber industry is responding positively to these developments. Timber was one of the first building-material sectors to announce its intention to develop a harmonized set of product category rules for EPDs in line with EN 15804. Equivalent work is also expected to start in 2014 on a range of finished wood products, including doors, windows, shutters, curtain-walling and flooring (Anderson, 2014). Efforts are being made to assist with the development of EPDs at the national level by compiling comprehensive LCA data for timber and wood products, for example through the United Kingdom's Wood First Plus Initiative.

The American and Canadian Wood Councils have made EPDs available for specific wood product categories, including sawn softwood, softwood plywood, oriented strand board, glued-laminated timbers, laminated veneer lumber, wood I-joists, redwood decking, medium-density fibreboard and particle board (AWC, 2014). These EPDs are independently verified by Underwriters Laboratories to ensure that EPDs conform to ISO 14025 requirements.

2.5 CONCLUSIONS

Policies related to wood and forest product markets continue to influence, for the most part favourably, the use of wood and how it is viewed as an environmentally preferable material. The EUTR, the new European Forest Strategy and the developing TTIP trade agreement are key recent and ongoing initiatives. Efforts to increase certification, support green building and develop carbon and other ecosystem markets will also continue to have an influence.

[11] The sum of all the energy required to produce any goods or services, considered as if that energy was incorporated or 'embodied' in the product itself.

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3 INNOVATIVE WOOD-BASED PRODUCTS

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HIGHLIGHTS

- Viscose, a wood-derived fibre, comprises 6% of the global fibre market. It occupies third place in that market, after synthetics and cotton and ahead of wool.
- While traditional viscose has many environmental flaws, modern wood based fibres can be considered as the most sustainable of the world's four most commonly produced fibres.
- The sustainability credentials of wood-derived fibres are further enhanced by new forms such as Tencel® and "wet modulus" viscose, which have relatively green production systems, as well as by the development of less-damaging "closed loop" systems for existing wood-derived fibres.
- More than 90% of wood-derived fibres are produced outside the UNECE region (primarily in Asia), although much of this production is in European-owned factories.
- Wood-derived fibres are a close substitute for cotton: the frequent cotton crop failures from 2004-2012 led to record price increases for wood-derived fibres as well as substantial investment in new manufacturing capacity.
- Several researchers theorise that a"cotton peak" may already have been reached, in which case the production of wood-derived fibres may grow significantly in order to meet increasing demand for naturally derived skin- and environmentally-friendly fabrics.
- Innovation in wood-derived fibres is improving the outlook for their use. For example, Tencel® (produced by the Austrian Lenzing Group) is a strong, machine-washable, sustainably produced fibre; it is likely to see increased worldwide demand for use in both woven products and "non-wovens" (e.g. wet wipes and mattress stuffing), with an increased production base in Europe.
- The UNECE organized the "Forests for Fashion" event in March 2014, which gathered together producers, researchers and journalists and showcased wood-derived fabrics in a highly successful and innovative display.
- Recommendations from the Forests for Fashion event are reflected in this chapter and include: raising public awareness of sustainable fibres; building vertical and horizontal links among sustainable producers and finishers; creating certification methods to reassure consumers; and addressing the issue of fabric waste and reclamation.

3.1 INTRODUCTION

This chapter focuses on developments in the wood-derived fabrics industry and their implications for the production of sustainable clothing. At present, modern wood-derived fibres represent the only potential source of sustainable clothing. Reclamation from current production (recycled fibres) can help, but it cannot fully meet the needs of the expanding world population. With likely future limitations on the supply of fossil-fuel-derived oils for the production of synthetic fibres, the environmental downsides of cotton, and a lack of other viable alternatives (for example, hemp and soya currently constitute only a tiny proportion of world fibre supply), dissolved-pulp fibres – both innovative and traditional – offer the greatest hope of a sustainable clothing material sufficient to meet global needs.

The popularity of fibres has tended to be inversely proportional to their sustainability (Patel, 2014); historically, the market share of natural fibres has decreased over time compared with artificial fibres (The Fiber Year, 2014). Synthetic fibres, which are made from fossil fuels using environmentally damaging processes, are the most popular fibres worldwide, with over 61% of the global fibre market; their popularity can be explained by their low prices, colour-fastness and durability. The second most popular fibre, with 31-32% of the global fibre market, is cotton, which is grown in very large monocultures and is a major user of pesticides, which can be environmentally damaging. Cotton production and processing also involves the consumption of large quantities of fresh water, an increasingly scarce resource (Hämmerle, 2011). The production of "organic" or "clean" cotton has been attempted, but such cotton accounts for less than 1% of current cotton sales and its production still uses large volumes of water (Dirksen, 2008).

Source: Lenzing, 2014.

In third place in the global fibre market, with 6% of global market share (well ahead of the next-most-popular fibre, wool, which accounts for less than 1% of the global market), is a wood-derived product: viscose. Viscose is produced using a pulp-dissolving process to extract cellulose (a substance that comprises 40-50% of wood). The extracted cellulose is treated chemically in various ways depending on the desired end-product and mechanically spun into threads to create viscose. The basic process for viscose production was invented in the nineteenth century and is used successfully to create a cheap artificial silk known as rayon. "Viscose" is the generic name for the overwhelming majority of products produced in this way worldwide; its properties are given later in this chapter (table 3.3.2) in a comparison with other, more modern wood-derived fibres.

Because there is no outstanding patent on viscose, it remains by far the most commonly produced wood-derived fibre worldwide. Viscose comes in a variety of subtypes, generally determined by the trees used in its production.

3.2 ENVIRONMENT

There are several problems with viscose's "green" credentials. Production is relatively energy intensive compared with cotton: the production of 1 kg of viscose fibre consumes as much or more energy as cotton. Moreover, carbon disulphide, the most commonly used solvent in viscose production, is highly toxic. In older viscose plants, more than 50% of the carbon disulphide used is released into the air. The production of rayon in the UNECE region must comply with clean-air and clean-water regulations, and some producers, notably in the US, abandoned the industry rather than retool. Outside the region, however, rayon production may continue to be environmentally damaging (Batra and Blackburn, 2011).

In its basic form, moreover, viscose is not a machine-washable fabric, meaning that some viscose products may need to be dry-cleaned – not usually regarded as an environmentally friendly cleaning method. On the other hand, high-wet-modulus viscose, a product developed in the 1960s, retains much of its strength when wet and is suitable for machine washing (Textile Exchange, 2014).

The development of high-wet-modulus viscose, and other advances in production methods, means that newer forms of viscose can be considered the most environmentally friendly of the four most common fibres in production today. Table 3.2.1 shows the quantities of water, land, chemicals and energy required to produce lyocell fibres (another form of rayon and a wood-derived fibre), viscose, cotton and polyester, and the greenhouse gas emissions associated with the production of each; it shows that lyocell and viscose perform much better than cotton on almost all measures and much better than polyester in energy demand and greenhouse gas emissions.

TABLE 3.2.1

Environmental effects of fibre production

	Lyocell	*Viscose*	*Cotton*	*Polyester*
Water demand (1,000 l/kg)	0.1	0.25-0.5	7-20*	0.13
Land demand (m^2/kg)	17-66	17-66	66-200	…
Chemicals demand (g/kg)	345	…	350	…
Energy demand (MJ/kg)**	20-45	20-60	20-40	70-97
Greenhouse gas emissions (CO_2-eq/kg)	-0.25-0.3	0.9-1.6	2.2-4.4	4.1-4.5

Notes: * if irrigation is needed. ** non-renewable primary energy.
Source: Kalt and Zauner, 2001; Shen and Patel, 2010.

The environmental friendliness of viscose production is being further enhanced by Lenzing (Austria), Birla (India) and other companies in the UNECE region, which, to comply with anti-pollution laws, are using "closed loop" systems to ensure that toxic chemicals are re-used and do not escape into the environment.

3.3 MARKETS

3.3.1 Production

Approximately 4 million tonnes of pulp-derived viscose is being produced annually worldwide. The UNECE region accounts for 370,000 tonnes (just under 10%), of which Lenzing produces the lion's share (Lenzing. 2014b). Most of Lenzing's recent 100,000 tonne increase in capacity was driven by exports, because European demand for viscose is generally in decline. This decline is being partly offset by the fast-expanding "non-wovens" industry, in which viscose is the preferred fibre for wet wipes, hygiene products, surgical applications, mattress stuffing (Lenzing's Tencel® fibre was developed for this), heat insulation, sound absorption and aerosol filtration (Jahangiri, 2013).

Fifty-eight per cent of global viscose capacity is in China, where 27 plants each produce an average of 75,000 tonnes annually; increases in China are planned by Lenzing and the Indian company Birla. Chinese demand for viscose products is high and growing (Bywater, 2011), China is also the single biggest producer and consumer of dissolved pulp (graph 3.3.4), the source of viscose.

South and Southeast Asia produce approximately 900,000 tonnes of viscose per year, which is nearly one-quarter of global production. Birla is the leading producer in these subregions, producing 650,000 tonnes annually. In Indonesia, South Pacific Viscose, which is owned by Lenzing, produces more than 200,000 tonnes annually. While local demand is high, nearly 50% of the viscose produced in South and Southeast Asia is exported, mainly to Turkey but also to China and Western Europe.

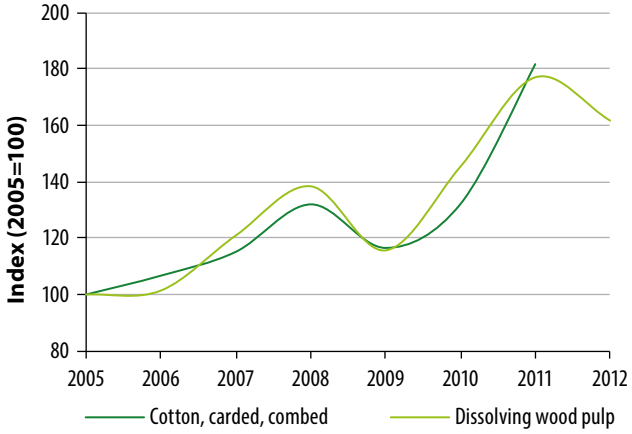
The rest of the world (i.e. excluding the UNECE region, China, South and Southeast Asia, and India) produces only 220,000 tonnes of viscose per year (less than 7% of global production). Viscose production has largely ceased in eastern Europe and North America but is growing in Brazil, Japan and Taiwan, Province of China. Birla plans to increase its global production of viscose to one million tonnes by 2020 and to this end is building a plant in Egypt (Bywater, 2011).

3.3.2 Prices

Globally, the major planned and actual increases in viscose production capacity could cause volatility in the viscose market, with the attendant risk of a drop in price (Johard, 2013). Generally, however, viscose fibre is a close substitute for cotton and its price correlates closely with cotton prices (graph 3.3.1). Increases in the price of viscose in recent years to record levels were due largely to widespread failures of cotton crops in 2004–2012. In turn, the increase in viscose fibre price led to an increase in the price of commodity dissolving pulp (Stone, 2013).

GRAPH 3.3.1

Global export prices of dissolving pulp and cotton, 2005-2012



Note: Export price indices.
Source: FAOSTAT, 2014.

Led by this price boom, world production of viscose grew by 84% between 2004 and 2012, with most of the new production capacity installed in China, whose share of global production increased from 38% to 61% in the period. In turn, China's viscose fibre production has been the major driver of global demand for commodity dissolving pulp. Global dissolving pulp capacity nearly doubled between 2008 and 2013, increasing by 3.1 million air-dried metric tonnes.

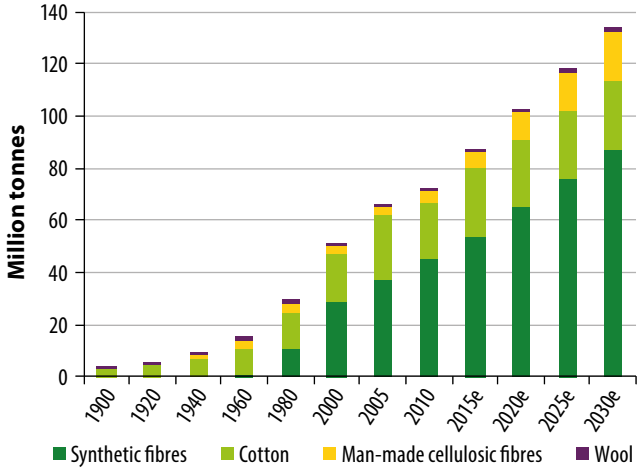
Although the viscose boom that arose as a result of the cotton slump (and a rise in oil prices) looks to be coming to an end, cotton prices could rise in the long term because of conflicts over water use, insecticides and taking productive land away from cultivation of food crops, which have already led to export restrictions in India and Pakistan, two of the largest cotton-producing countries. On the other hand, the cotton industry has dealt with similar problems in the past by gains in production efficiency (Johard, 2013).

Lenzing has based its corporate strategy on projections of future trends in viscose production; these refer to a "cellulose gap" in which demand for good-quality cellulose-derived fibres cannot be fulfilled by current supply (Lenzing, 2014a). The implication

is that, for as long as the cellulose gap continues to increase, it will be profitable for existing firms to expand production and new firms to enter the industry. The gap is expected to increase to 3.3 million tonnes by 2020 (Lenzing, 2014c). Lenzing expects growth in cellulose-based fibres (overwhelmingly viscose) to nearly double in the five years to 2020, while the production of cotton is not expected to grow significantly because of limits to the availability of land and water (graph 3.3.2).

GRAPH 3.3.2

Development of filament and fibre consumption, 1900-2030



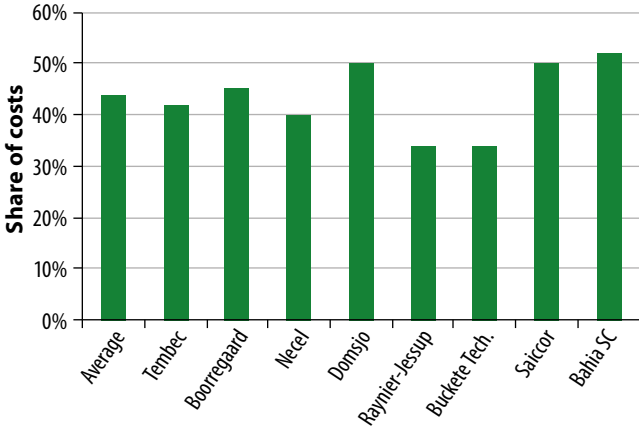
Notes: e = future estimates and based on assumption that cotton is at peak production, i.e. reaches maximum potential for cultivation.
Source: Hämmerle, 2011.

3.3.3 Raw materials

The yield of dissolving pulp (35%) is lower than for all other commercial uses of wood pulp, and there is a considerable advantage to be gained in locating plants close to wood sources in order to limit transport costs. In a review of the costs of eight international producers, Stone (2013) found that, on average, wood fibre represented 44% of the total cost of dissolving-pulp production (graph 3.3.3). For those dissolving-pulp producers that must import a significant part of their wood fibre, cost structures are closely tied to the prices of imported wood.

GRAPH 3.3.3

Wood fibre's share in the production costs of dissolving pulp (2010)

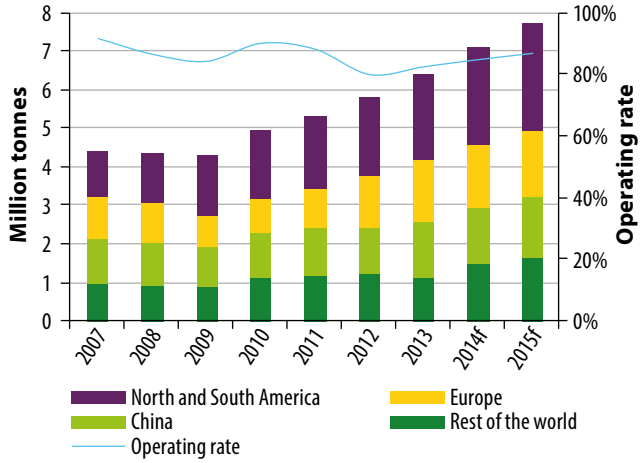


Source: Stone, 2013.

Graph 3.3.4 shows global production of dissolving pulp. China is the largest producer country. The operating rate (production capacity) is also shown.

GRAPH 3.3.4

Global production of dissolving pulp, 2007-2015

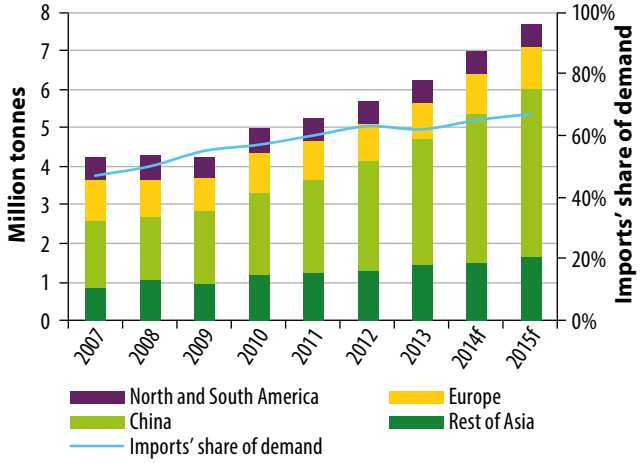


Note: f = forecast
Source: RISI, 2014.

Given the Chinese dominance of this market, with the highest dissolving pulp demand (graph 3.3.5), it is interesting that the trend in China's wood import prices is upward. Unsurprisingly, China's dissolving pulp producers are at an increasing disadvantage when compared to dissolving pulp producers in timber-rich countries (such as many UNECE countries) because of the rising cost of their wood imports. The Chinese import price for wood chips and roundwood more than doubled between 2002 and 2012, to approximately $100 and $200 per m^3, respectively (FAOSTAT, 2014; Stone, 2013), and Chinese labour costs are also increasing. The combination of these factors will affect Chinese dominance of the viscose market and may create opportunities for UNECE producers.

GRAPH 3.3.5

Global demand for dissolving pulp, 2007-2015



Note: f = forecast
Source: RISI, 2014.

According to Schweighofer Fibre (Austria), prices for dissolving pulp were highly volatile in the period 2010-2013, fluctuating between $1,000 and $2,300 per tonne (Timber Online, 2013). Table 3.3.1 shows that the top exporters of dissolving pulp are South Africa, Canada and the US, while the largest importers, excluding Germany, are Asian countries; the table also illustrates the position of China as the leading importer (by far) of dissolving pulp and therefore the most vulnerable to increases in transport costs.

TABLE 3.3.1

Top net importers and exporters of dissolving pulp, 2012

(tonnes)			
Exporter	*Net exports*	*Importer*	*Net imports*
South Africa	705,929	China	1,709,861
Canada	676,861	Indonesia	431,432
US	405,363	Germany	371,000
Brazil	390,600	India	201,727
Sweden	375,987	Thailand	140,481

Source: FAOSTAT, 2014.

In Austria, Lenzing buys only 35% of its wood locally. Previously, wood could be sourced from within 200 km, but the range has now increased to 800 km, partly because of increased production and partly because of increased competition for wood.

Conflicts of interest over raw materials may occur with other pulping/cellulose-based industries and the rural and industrial energy sectors, leading to higher prices (Isopp, 2012). Fabric producers are a high-value-added industry, making them more competitive in the market for cellulose given the low effect of raw-material price on end-product price.

The supply of wood is only part of the story, however, because fabric mills compete primarily for pulp rather than industrial roundwood, so their main competitors are conventional paper pulp mills rather than other timber users. There is a small price differential between pulp products (on average, pulp sells in the range $200-$250). The high price increases for dissolving pulp in 2007 and 2010 were due to increased demand from viscose fabric mills, which, in turn, were driven by the rise in cotton and synthetic fibre costs (the latter caused by rises in oil prices) (Johard, 2013).

3.3.4 New products

Table 3.3.2 lists some of the newer wood-derived products that could be described as "greener" alternatives to viscose. All these products are produced by Lenzing, and a number of other companies, notably Birla, have also produced similar second-generation wood-derived fibres.

Modal, a second-generation viscose product, can be machine-washed, although it is made by largely the same viscose process. Tencel®, yet another Lenzing product, made by a similar process to that for lyocell, is a truly "green" fabric because it uses environmentally friendly amine acid, which is wholly reclaimed at the end of manufacture. "Pipeline" products by other manufacturers, such a product in development in Scandinavia based on ionic solvents, also offer hope for the future (Aalto University, 2013). There may also be applications for the nano-crystalline cellulose technology already used by the paper industry (Government of Canada, 2013).

The British firm Courtaulds invented and invested in Tencel®, only to go bankrupt largely as a result; this is an illustration of how long it can take a new fibre to become commercially viable and of the risks involved in bringing new products to market. Lycra and Kevlar are examples of the (minimum) 10-15 year time span the product development process can take; neither modal, cupro nor lyocell fibres can be expected to be major world players in the next five years (Owen, 2012).

TABLE 3.3.2

Production process, characteristics and use of cellulosic chemical fibres

Fibre	*Process, dissolving method and spinning*	*Typical material characteristics*	*Use*
Viscose	Pulp is dissolved in sodium hydroxide and carbon disulphide to gain spinning mass; uses wet-spinning method	Satisfactory dry strength, low elasticity, falls nicely, often gleaming, highly absorbent, fine, soft and skin-friendly	Blouses, dresses, interlining, clothes
Modal	Modified viscose process: other spinning conditions and amine oxide and the cellulose is dissolved in N-Methylmorpholine N-oxide; uses wet-spinning method	Similar to viscose; improved dry strength and much better wet strength	Often combined with cotton
Cupro	Copper oxide-ammoniac method: copper oxide-ammoniac used to dissolve pulp; uses wet-spinning method	Similar to viscose	Similar to viscose
Lyocell	Solvent-spinning method: dissolving pulp in a mix of amino oxide and water; very environmental friendly (non-poisonous, recoverable chemicals and water); wet-spinning method	Higher strength even higher than modal; otherwise, same properties like modal: high strength due to high chrystallinity in the inner parts of the fibres, which causes fibrillation	Often combined with cotton

Notes: All these fibres are based on dissolved cellulose from pulp factories, and the final fibre substance is cellulose.
Source: After Ring, 2013.

Tencel® was launched by Courtaulds in 1992, but it still accounts for less than 10% of the output of Lenzing, its sole producer, and for only 0.5% of world production of wood-derived fibre (Stone, 2013). While the process to produce lyocell itself is not patented, Lenzing holds four separate patents necessary to spin and dye the resultant fabric and so will continue to be the sole producer of Tencel® for the foreseeable future (Lenzing, 2012). The process for dyeing Tencel® differs from cotton – it generally needs less dye but also reacts to particular dyes differently, which may create difficulties for an overwhelmingly cotton-focused finishing industry, as well as for fashion designers following the current vogue for designer-made digital prints (Owen, 2012).

3.4 POLICY ANALYSIS AND RECOMMENDATIONS

3.4.1 Stating the problem

None of the greener products on the market is perfect. Viscose, by far the most popular wood-derived fibre, has its problems, notwithstanding the improved environmental standards being promoted strongly by companies such as Lenzing. A large number of "green" fibres, including viscose, are vastly superior to cotton and synthetics in terms of their environmental impacts (Patel, 2014). Lenzing for example was granted the EU Ecolabel for four of its six production facilities.

The discussion in section 3.3.2 showed that rising cotton prices benefited wood-derived fabrics and led to a boom in viscose production. It is also possible that increased awareness of the superior green credentials of even the most old-fashioned of the wood-derived products could affect the market. The fashion industry is strongly influenced by public taste, and many fabrics have fallen out of favour simply because a trend has passed (this was the fate, for example, of "peach-textured" Tencel®-derived denim in Japan in the 1990s; Owen, 2012).

Awareness of the environmental impacts of different fibres is low among the general public: for example, many people think cotton is a "green" fibre because it is "natural". Increased public awareness of the environmental impacts of different fibres would be to the advantage of wood-derived fabrics.

3.4.2 Lateral alliances

Forestry is a small player in the huge fashion and fabrics industry. To increase the use of sustainable fibres, it may be necessary to make alliances with other producers, such as the manufacturers of organic cotton, hemp and bamboo-derived fibres. While these producers could be seen as competitors, their situation is similar to that of the wood-derived fabric industry, and they would benefit more from taking some of the market share of synthetics and commercial cotton than from fighting over the tiny market share they currently have. A united "green fabric" front, using the publicity generated by some of the newer fabrics, could make a greater impact than any one industry campaigning alone.

3.4.3 Vertical alliances

Generally, fabric price accounts for only 1% of the cost of a finished garment. The production of clothing involves a much longer process than is common in the forest sector: the fibre must be produced; woven; put through a variety of finishings to make it suitable to be worn next to the skin; dyed; and sewn into a garment (Isopp, 2012). The environmental credentials of the raw fibre are an important consideration, but a "green" fibre does not necessarily equate to a "green" garment.

To promote an unambiguous message of sustainability, vertical alliances are needed with production and finishing companies that are also aiming to reduce the ecological footprints of their products. In an excellent step in this direction, UNECE organized the "Forests for Fashion" event in Geneva, Switzerland, in March 2014. This event gathered together producers, researchers and journalists and showcased wood-derived fabrics in a highly successful and innovative display (UNECE, 2014). Such

groundwork needs to be extended and turned into practical results if vertical alliances are to be effective.

3.4.4 Green passport

These lateral and vertical alliances could be put to good effect in promoting sustainable wood-derived fibres by creating recognizable labelling – a "green passport" for garments – showing how every stage in the process meets a certain standard. In addition to environmental credentials, such labelling would need to accommodate other issues, such as those associated with labour protection, because exposés of exploited or endangered labour can undermine an entire brand. A number of green labels are at various stages of development (EFF, 2011a), but the general public is wary of potential "greenwashing". The sustainability forces in the fashion industry should work together to create a single, identifiable green passport that guarantees that each step of a garment's production has been made to a measurable sustainability standard.

3.4.5 Waste

If fabrics are to be promoted under a sustainability banner, the topic of waste fabric will need to be addressed, in the same way that it is nearly impossible to have a discussion about food without discussing food waste. Currently, all three of the world's most popular fibres are very cheap – people in the UNECE region have never had such good access to so much inexpensive clothing, and inexpensive, "disposable" clothing makes up the bulk of the fashion industry.

With such low costs, much perfectly good fabric is wasted at various stages of the production process because it is cheaper to discard than reclaim. At the consumer level, it is increasingly unusual for worn or damaged clothing to be repaired, and so large amounts of finished fabric are routinely discarded and destroyed, despite being a plentiful source of finished cloth (EFF, 2011b). This waste is both at the high end of the market, where labour-intensive, high-quality garments are only worn a few times before being discarded (or rarely recycled as vintage clothing), and at the lowest end, where cotton T-shirts and jeans are usually discarded once torn or stained.

To an extent, producing more and cheaper green fabrics to be fed into a wasteful process would be environmentally friendly in only a nominal sense. Any of the alliances proposed above would also have to be seen to be taking action on fabric waste if they are to promote themselves under a sustainability banner.

Source: UNECE/FAO, 2014.

Forests for Fashion - Fashion for Forests UNECE, Geneva 21 March 2014

This event was organised by the Italian Permanent Mission to the UN, the Swiss Government and the UNECE-FAO Forestry and Timber Section, to foster dialogue between the forest and fashion industries.

It consisted of art events and installations by the renowned artist Michelangelo Pistoletto, a conference with presentations by several of the authors credited in this paper, as well as producers, critics and commentators such as Xenya Cherny-Scanlon, Special Adviser to the Director General, International Union for Conservation of Nature (IUCN), and Rossella Ravagli, Gucci's Corporate Social and Environmental Responsibility manager.

The day concluded with an innovative Dance/Fashion show, highlighting environmentally friendly fabrics in garments produced by international designers. The event was a hugely successful exchange of information and strategies between people with a great commitment to creating an environmentally friendly fashion and clothing industry.

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4 WOOD RAW MATERIAL

Lead author: ***Håkan Ekström***

HIGHLIGHTS

- Increased global demand for forest products in 2013 resulted in the highest timber harvests for six years in the UNECE region, with sawn softwood in particular increasing in demand.
- In Europe, the biggest increases in timber harvests in 2013 were in Finland, Poland, Romania and Spain. Europe continued to be a net importer of roundwood.
- Removals of industrial roundwood in the CIS increased by 1.8% in 2013.
- Ukraine exported 43% of its harvest in log form, with a major increase in exports to China.
- Industrial roundwood removals in North America increased in 2013 but were still barely two-thirds the removals in 2006.
- The consumption of industrial roundwood in the UNECE region was 984 million m^3 in 2013, up by 1% from 2012 and by 17% from 2009. The highest increase in consumption in 2013 was in Europe.
- Higher demand for roundwood in the UNECE region was driven mainly by improved markets for sawn softwood, both within the region and in extra-regional markets such as China, Japan, the Middle East and North Africa.
- The global trade of softwood logs was up by 17% in 2013: New Zealand became the world's largest exporter of this product in 2013, while the formerly dominant role of the Russian Federation has been in decline since 2008.
- Wood-fibre consumption by Europe's pulp industry remained unchanged in 2013, but its reliance on imported wood fibre increased to about 20% of its total fibre consumption.
- Global softwood sawlog prices increased in 2012 and 2013, reaching close to record highs in a number of markets, driven by higher log trade and increased sawmill production.
- The cost of wood chips and pulplogs for the pulp-producing industry fell in 2012 and 2013: the biggest declines were for hardwood logs in Asia and Latin America.

4.1 INTRODUCTION

A worldwide rise in demand for forest products in 2013 resulted in the highest timber harvest in the UNECE region since 2007.

Of the total roundwood removals of 1.2 billion m^3 in the UNECE in 2013, approximately 16% (194 million m^3) were used for fuel. Most of this woodfuel was consumed in Europe, which accounted for almost 60% of total consumption in the UNECE region.

This chapter focuses mainly on the production, consumption, trade and price of industrial roundwood. See chapter 9 for further insight into trends for wood raw materials in the wood energy sector.

Removals of industrial roundwood, which reached 1 billion m^3 in 2013, have been trending upward for five years and were more than 17% higher in 2013 than in 2009. The increase in industrial roundwood removals in 2013 over 2012 was greater for softwoods than for hardwoods. Since 2009, however, harvests of hardwood species have risen faster than those of softwoods. Overall harvest levels increased by almost 2% in Europe and the CIS in 2013 (compared with 2012) and by 0.3% in North America.

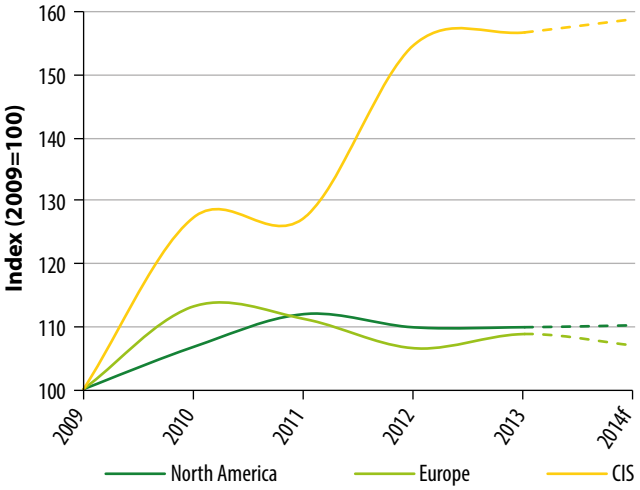
The consumption of industrial roundwood by the forest industry in the UNECE region was estimated at 984 million m^3 in 2013, which was 1% higher than in 2012 and 17% higher than in 2009. This was the fourth consecutive annual increase, with the manufacturing industries in all UNECE subregions consuming more logs in 2013 than they did in 2009. Europe recorded the biggest rise in roundwood production and consumption in 2013 compared with 2012, while roundwood production and consumption were almost unchanged in North America in 2013.

Source: UNECE/FAO, 2014.

Much of the higher demand for roundwood was the result of improved sawnwood markets. The production of sawn softwood increased in the UNECE region in 2013 by 3.3% to meet higher demand both in the UNECE (graphs 4.1.1 and 4.1.2) and in extra-regional markets such as China, Japan, the Middle East and North Africa.

GRAPH 4.1.1

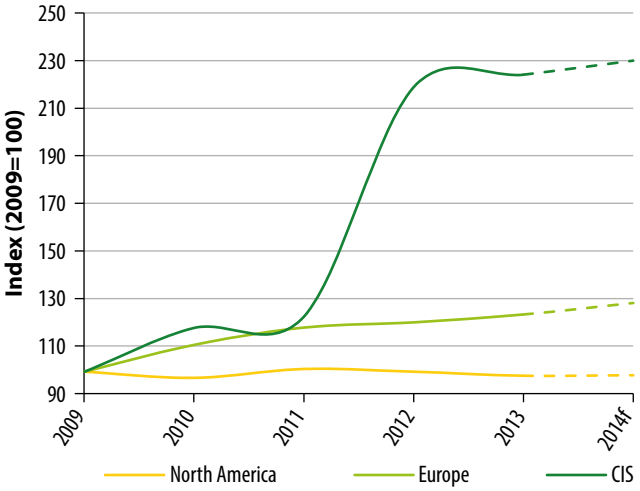
Index of apparent consumption of softwood industrial roundwood, UNECE region, 2009-2014



Notes: f=2013 Committee on Forests and the Forest Industry forecast. "Industrial roundwood" excludes woodfuel.
Source: UNECE/FAO, 2014.

GRAPH 4.1.2

Index of apparent consumption of hardwood industrial roundwood, UNECE region, 2009-2014

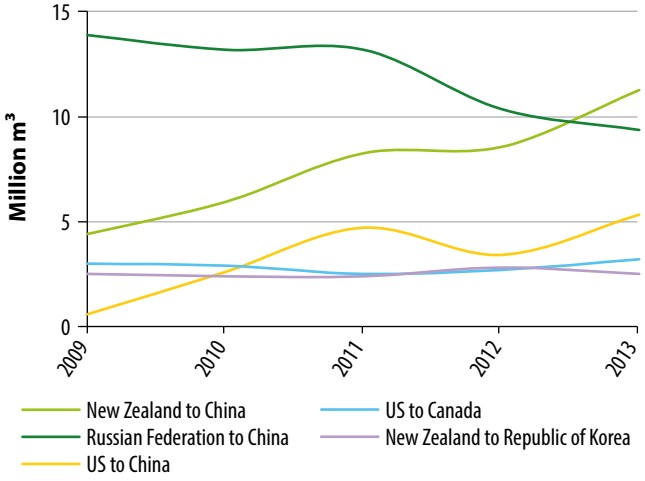


Notes: f=2013 Committee on Forests and the Forest Industry forecast. "Industrial roundwood" excludes woodfuel.
Source: UNECE/FAO, 2014.

Log exports by UNECE countries increased by more than 11.3% in 2013, with exports exceeding imports by 27 million m^3. The biggest increases in trade in 2013 were in US exports of softwood logs to China; softwood log imports to Germany from neighbouring countries; softwood and hardwood imports to Finland from the Russian Federation; and exports of softwood logs from Norway to Sweden. The major global log trade flow continues to be to China from New Zealand, the Russian Federation and the US, with New Zealand surpassing the Russian Federation in 2013 as the world's largest overall exporter of softwood logs (graph 4.1.3).

GRAPH 4.1.3

Top five global trade flows of softwood roundwood, 2009-2013



Source: WRI, 2014.

4.2 EUROPE

4.2.1 Industrial roundwood markets

Timber harvests in Europe were stable in the period 2010-2013, ranging between 363 million and 373 million m^3 annually. The harvest in 2013 was close to 370 million m^3 (table 4.2.1), still well below the ten-year high of 413 million m^3 in 2007.

Softwood accounted for about 76% of total removals in 2013; this percentage varied little (in the range of 76-78%) in 2008-2013. Hardwood removals, on the other hand, have increased every year since 2009 and were 21% higher in 2013 than in 2009.

The biggest increases in roundwood removals in 2013 were in Finland (+ 4.7 million m^3), Romania (+1.3 million m^3), Spain (+943,000 m^3) and Poland (+907,000 m^3). In Finland, an increase in logging by private landowners was driven by higher demand for softwood sawlogs in the domestic sawmilling subsector, increased use of both softwood and hardwood pulplogs by the pulp industry, and higher log prices. In Romania, an expansion of the sawmilling industry provided landowners with an opportunity to sell more logs. In Spain, the pulp industry increased its use of domestic eucalyptus pulplogs in preference to importing wood chips from Latin America, and the country also substantially increased its log exports to Portuguese pulp mills. Timber harvests were higher in Poland because sawmills in the Czech Republic and Germany increasingly looked to that country for their supply.

TABLE 4.2.1

Industrial roundwood balance, Europe, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Removals	362,638	369,537	375,195	1.9
Imports	50,016	56,981	57,970	13.9
Exports	37,925	43,230	43,548	14.0
Apparent consumption	374,730	383,288	389,617	2.3

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

4.2.2 Trade of roundwood and wood chips

The trade of roundwood in Europe picked up in 2013, with import volumes attaining their highest level since 2008 and log exports reaching a ten-year high. Europe continued to be a net importer of logs: the import-to-export imbalance increased from 12.1 million m^3 in 2012 to 13.8 million m^3 in 2013. There were significant increases in imports of softwood logs by Germany and Sweden and in hardwood pulplog logs from the Russian Federation to Finland.

Source: UNECE/FAO, 2014.

Sweden is the world's fourth-largest importer of logs, even though almost two-thirds of the country is forested. Sweden's import log volumes grew steadily between 2008 and 2013 and were almost 60% higher in 2013 than in 2008. This growth was driven by the quest of forest companies for cost-competitive raw materials and because Norway produces more pulp logs than it can consume.

Pulp mills in Finland increased their reliance on imported birch from the Russian Federation to levels not seen for more than five years. In 2013, Finland imported about 4 million m^3 of birch logs from the Russian northwest, almost tripling the volume recorded in 2008. Finland's total importation of hardwood logs – including shipments from Estonia and Latvia – in 2013 was just over 4.9 million m^3.

Poland's softwood log exports in 2013 were almost 150% higher than in 2012 and three times higher than in 2009. Poland's western region exported over 2.7 million m^3 in 2013, mainly to the Czech Republic and Germany.

For each year in the period 2010-2012, Germany imported about 4 million m^3 more softwood logs than it exported (5.4 million m^3 more in 2013). Imports accounted for more than 14% of the country's total consumption of softwood logs in 2013, compared with only 5% in 2003. The German forest industry is worried that domestic timber harvests will continue to decline, leaving it increasingly dependent on imported logs.

The global trade of wood chips increased in 2013, reaching a record high of 34 million tonnes. The expansion in trade was all in Asia, and Europe's trade declined in the period 2011–2013. Europe's pulp mills and fibreboard manufacturers imported just over 9 million tonnes of wood chips in 2013, down by 17% from 2010. Europe's biggest importing countries were Finland (the world's third-largest importer of wood chips), Turkey, Austria and Sweden (in descending order). The largest exporters in the subregion in 2013 were Germany and Latvia.

4.2.3 Consumption of wood fibre by the pulp industry

Wood-fibre consumption by the European pulp and paper industry was steady in 2013, although it was still lower than the average annual consumption in the ten-year period to 2013 (CEPI, 2014). Softwood fibre's share of total virgin fibre consumption was surprisingly stable for the ten years to 2013, fluctuating between 72.2% and 74.2%.

With slightly higher sawnwood production and therefore a larger supply of residual wood chips, some pulp mills in Europe were able to substitute these chips for the more expensive pulplogs in their fibre mix. As a result, the share of softwood chips increased to almost 23% of the total fibre intake, while the share of softwood roundwood fell below 50% and hardwood fibre was unchanged at 27%.

European pulp mills increased their reliance on imported wood fibre in 2013, importing almost 20% of their fibre needs, typically from neighbouring countries. Only pulp mills in Portugal and Spain imported wood chips from outside Europe (from Latin America). Countries with the largest percentages of imported fibre were the Czech Republic (45%), Austria (41%), Germany (20%) and Norway (16%), while, at the other end of the spectrum, Finland, Poland, Spain and Sweden imported the smallest .

4.3 COMMONWEALTH OF INDEPENDENT STATES

4.3.1 Industrial roundwood markets

Removals of roundwood were higher in 2013 than in 2012 in each of the three major forest-covered countries in the CIS subregion – Belarus, the Russian Federation and Ukraine. Total removals in the CIS were approximately 200 million m^3 (table 4.3.1), of which 90% occurred in the Russian Federation, 5.5% in Belarus and 4% in Ukraine. Timber harvests increased dramatically in these three countries in the five years to 2013 as a result of higher exports of both logs (in Belarus and Ukraine) and processed forest products (mainly in the Russian Federation and Ukraine). About 12% of the total harvest in the CIS was exported in log form in 2013.

TABLE 4.3.1

Industrial roundwood balance, CIS, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Removals	196,125	199,663	204,600	1.8
Imports	713	615	615	-13.8
Exports	23,149	23,765	25,499	2.7
Apparent consumption	173,690	176,513	179,716	1.6

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

According to official statistics, 180 million m^3 of Russian industrial roundwood were harvested in 2013, 1.6% more than in 2012 and 60% more than in 2009. This sharp increase in the reported harvest volume since 2009 is puzzling because log exports fell by 14% in the same period. Moreover, government agencies reported that the two main domestic log consumers– sawn softwood and pulp – only increased production by 23% and 13%, respectively (see chapter 5 and 8).

Approximately one-third of the harvest in the Russian Federation in 2013 was hardwood, predominantly in the west of the country, both for export and for domestic manufacturers of pulp and plywood. Softwood timber harvests were distributed more evenly across the country, with the sawmill subsector by far the largest consumer of softwood logs.

The biggest increases in timber harvests in the five years to 2013 were in the southern and central parts of the Russian Federation (WhatWood, 2014). The increases were relatively smaller in the rest of the country where the forest industries are larger.

In previous years the Review highlighted that the volume of Russian harvest data remains uncertain since "undocumented" timber harvest could range between 25-30 million m^3. According to assessments made by WWF Russia (2006) and the World Bank (2011), up to 20 % of timber harvested in the Russian Federation (or about 35-40 million cubic meters) is of illegal origin (WWF Russia 2014).

4.3.2 Trade in roundwood

After two years of decreasing log exports from the CIS in 2011 and 2012, the trend reversed in 2013 and shipments to international markets increased by about 5% or 1 million m^3.

Ukraine exported 43% of its total timber harvest in log form in 2013. Despite ongoing unrest in the country, there were positive developments in the log export sector in 2013 and early 2014. In 2013, Ukraine exported just over 3 million m^3 of roundwood, a 35% increase from 2012 and double the volume exported in 2009. This expansion made Ukraine the world's sixth-largest exporter of softwood logs; to a large extent the increase was the result of a tripling of exports to China in 2013. Other major destinations for Ukrainian logs were Austria, Romania and Turkey.

In 2008, the Russian Government applied a tax to log exports with the aims of reducing exports of wood raw material, encouraging investment in domestic wood products processing, and increasing exports of sawnwood and plywood. The first objective has been achieved. When export tariffs of 25% were applied to softwood logs, all major trading partners quickly reduced their reliance on Russian logs and diversified their sources of log supply. All-time-high softwood log exports in 2006 and 2007 fell by about 30% in 2008, the first year in which the higher log export tax applied. By 2013, softwood log exports had declined to one-third the volume in 2007. The bottom appears to have been reached in 2012, since log exports increased by 8% in 2013 compared with 2012, and the volume of log exports in the first four months of 2014 was 22% higher than in the corresponding period in 2013. It is unlikely, however, that volumes will ever again match the levels of 2007.

Source: UNECE/FAO, 2014.

4.4 NORTH AMERICA

4.4.1 Industrial roundwood markets

Industrial roundwood removals in North America, of which approximately 75% were softwood species, increased by 0.3% in 2013, to 442 million m^3 (table 4.4.1). The hardwood harvest accounted for the majority of the increase.

TABLE 4.4.1

Industrial roundwood balance, North America, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Removals	440,601	441,711	442,858	0.3
Imports	5,662	5,891	5,963	4.0
Exports	20,263	23,500	23,659	16.0
Apparent consumption	426,000	424,102	425,162	-0.4

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

Softwood removals in the US were up by about 1% in 2013, primarily as the result of higher log exports to Asia and higher domestic sawnwood production, however, current removals are still barely two thirds of what they were in 2006. Increased domestic manufacture of sawn hardwood increased the production of hardwood sawlogs in the US in 2013. Demand for hardwood and softwood logs in the pulp sector declined, however, as a result of lower pulp production and the increased availability of co-products, such as wood chips, from the sawmilling sector. Logging activity varied throughout the country, with some regions, such as the northeast and parts of the south, recording only modest increases in roundwood removals, while others, such as forest-rich western Oregon, harvested 13% more volume in 2013 than in 2012.

The volume of timber harvests in Canada has increased each year since 2009, reaching 148 million m^3 in 2013, more than 30% higher than the volume harvested in 2009. Higher log exports to China and increased demand for logs from the domestic sawnwood industry were the major drivers of increased Canadian log demand in the period 2010-2013.

4.4.2 Trade of roundwood

North American log exports to Asia have boosted the profitability of timberland owners since 2010 and challenged the domestic solid-wood subsector in northwestern US and coastal British Columbia. North American net export volumes were 26% higher in 2013 than in 2012, with China the major destination. Almost 53% of overseas exports were shipped from the US northwest, 41% were shipped from British Columbia and the remainder was shared between Alaska, California and the US South.

Perhaps the most interesting development since the start of 2013 was the sharp increase in containerized log shipments

from the US South, mainly to China and India. Although the total volume of these was relatively small compared with volumes shipped from the US west coast, the US South's share of overseas exports was above 6% in the first half of 2014, compared with only 2% in the corresponding period in 2012.

Exports from coastal British Columbia to China increased by 25% in 2013. Shipments in the period July 2013 to March 2014 reached a record high; export volumes were 43% higher in the first three months of 2014 than in the same period in 2013. British Columbia's second-largest market, Japan, also imported more logs from coastal BC in the early part of 2014 than in the corresponding period in 2013. In contrast, the Republic of Korea reduced log imports from Canada in the first quarter of 2014.

4.4.3 Woody biomass markets

With no slowdown in demand in sight, North American wood-pellet exporting companies continue to build new facilities to manufacture pellets for the European market. Exports hit a record high in the last three months of 2013, and the total export volume in 2013 was up by almost 50% from 2012 (and more than double the volume in 2011). The total value of wood-pellet exports reached over $650 million in 2013.

A rapid expansion of pellet production capacity in the US South during 2012 and 2013 resulted in a tripling of pellet production in that region in just two years. This expansion, which was driven entirely by demand in Europe, increased pellet exports from 800,000 tonnes in 2011 to 2.9 million tonnes in 2013 (WRI, 2014a). The main wood-fibre source for pellet manufacture in the US South is roundwood. The consumption of logs for pellet production is now almost as high as log consumption for the production of OSB panels. Increased competition for logs in the US South is likely to push up wood raw-material prices in coming years for all subsectors of the forest industry.

The expansion of Canadian pellet exports has been less dramatic, but 2013 export volumes – the majority from British Columbia – were still more than 50% higher than in 2011. There were two recent developments of interest in Canada in 2013. One was the commencement of regular shipments of pellets to the Republic of Korea in the second half of the year; and the other was an increase in exports from the provinces of New Brunswick, Nova Scotia and Quebec. Pellet producers in Canada use a higher percentage of sawmill co-products than their competitors in the US, although the share of the more expensive roundwood is increasing.

4.5 EXTRA-REGIONAL INFLUENCES ON THE UNECE

The global trade of softwood logs was up by 17% in 2013, to 84 million m^3, based on WRI (2014b) estimates. This was the highest shipment of logs since 2007, when global trade was estimated at 86 million m^3.

Much has changed in global log-export markets since 2008. At that time, the Russian Federation was the dominant exporter, followed by the US and New Zealand. Russian exports have plummeted since, and New Zealand became the world's largest exporter of softwood logs in 2013, accounting for over 20% of the global trade. The Russian Federation and the US ranked second and third as global softwood log suppliers, each with about 15% of the global trade. Following the "big three" were Canada, France, the Czech Republic and Ukraine.

The surge in log exports from New Zealand was driven by Chinese demand and by its record timber harvest. In 2013, shipments from New Zealand to China accounted for 72% of the country's total export volume; other markets, in descending order, were the Republic of Korea, India and Japan. In the final three months of 2013, 57% of the timber harvest in New Zealand was exported in log form. Such a high share of exports of unprocessed wood is unmatched in the rest of the world.

Of the ten largest softwood-log importing countries, increases in volume in 2013 were led by China, Germany, Sweden, Finland and Canada (in that order). China's softwood log import volumes reached a record high, at almost 33 million m^3, up from 27 million m^3 in 2012.

4.6 WOOD RAW-MATERIAL COSTS

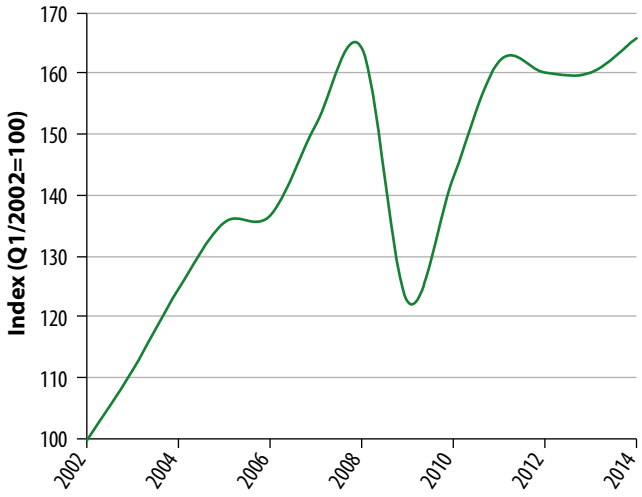
The price of wood raw material is the largest cost component in the manufacture of sawnwood and wood pulp. These costs generally increased for sawmills worldwide in 2012 and 2013 but fell slightly for the world's pulp industry.

4.6.1 Sawlog prices

The Global Sawlog Price Index, which is based on softwood sawlog prices in 20 regions worldwide, was 3.9% higher in the first quarter of 2014 compared with the same period in 2013, at $89.45/$m^3$ (graph 4.6.1). This was the highest price for softwood sawlogs in over two years and the third-highest since the inception of the index in 1995 (WRI, 2014b).

GRAPH 4.6.1

Global Sawlog Price Index, 2002-2014

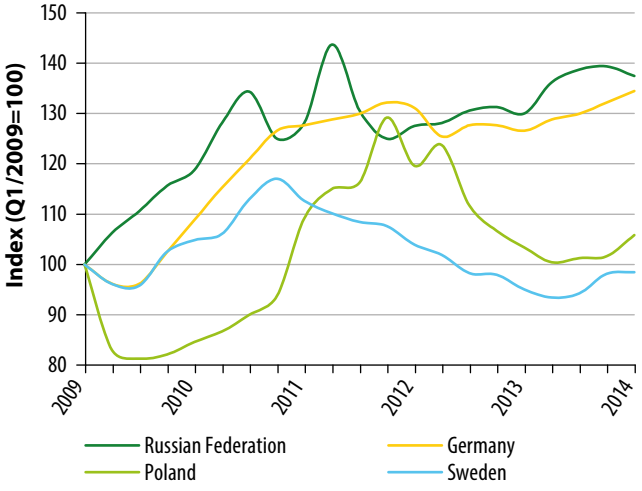


Note: Index based on delivered sawlog prices in 20 key regions worldwide.
Source: WRI, 2014b.

Many of the price increases around the world in 2013 were the result of substantially higher trade in logs and improved sawnwood prices in a number of key markets, particularly North America. Sawlog prices increased most in 2013 in North America and Central Europe due to tighter log supply, while they fell slightly (in US dollar terms) in Latin America and Oceania (graphs 4.6.2 and 4.6.3).

GRAPH 4.6.2

Softwood sawlog price indices, selected countries, 2008-2013



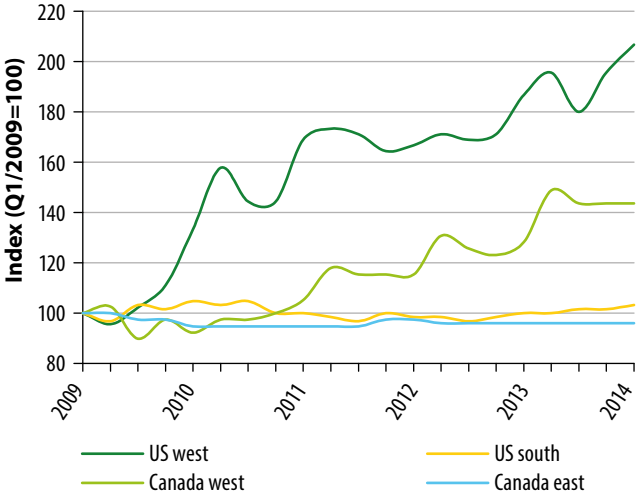
Note: Indices based on delivered log price per m^3 in local currencies.
Source: WRI, 2014b.

In local currencies, upward price movements were highest in 2013 in Japan, western US, Latvia, western Canada, Sweden and Chile, with prices by the end of the year 8-18% higher than in late 2012. Most of these countries are major sawnwood exporters; the increase in worldwide consumption of sawn softwood in late 2013 caused an increase in demand for sawlogs. Sawmills were forced to pay more for logs to obtain sufficient supply.

Price trends were geographically mixed in North America in 2013, with practically no change in eastern Canada, small increases in the US South, and upward price adjustments of 10-15% in western Canada and the US northwest (graph 4.6.3). These recent increases in western North America are likely to level out in 2014.

GRAPH 4.6.3

Softwood sawlog price indices, North America, 2009-2014



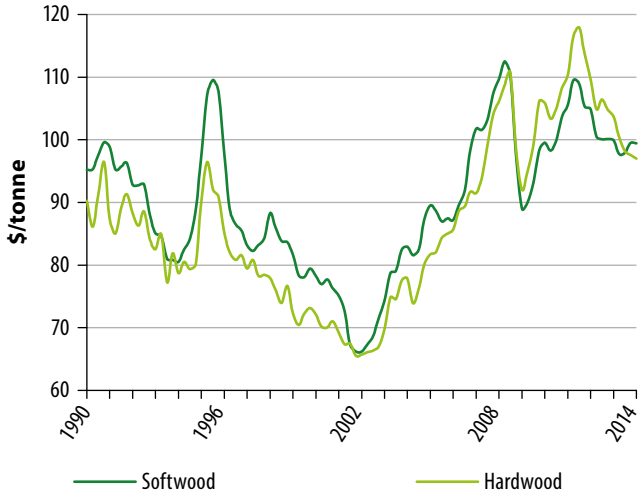
Notes: Indices based on delivered log price per m^3 in local currencies. "US South" shows the price for pine, "US west" the price for hemlock and "Canada west" and "Canada east" the prices for mixed conifers.
Source: WRI, 2014b.

4.6.2 Pulpwood prices

Wood-fibre costs for the pulp manufacturing industry decreased in many pulp-producing regions worldwide in 2012 and 2013 (WRI, 2014b) (graph 4.6.4), due mainly to lower prices for market pulp, especially hardwood pulp, and some paper grades. Other contributing factors were reduced pulp production and the increased supply of lower-cost co-products from the sawmilling sector in some regional markets. Although all wood-fibre prices generally decreased, softwood fibre prices fell most in 2012 and early 2013 but increased slightly in late 2013

GRAPH 4.6.4

Global wood-fibre price indices, 1990-2014

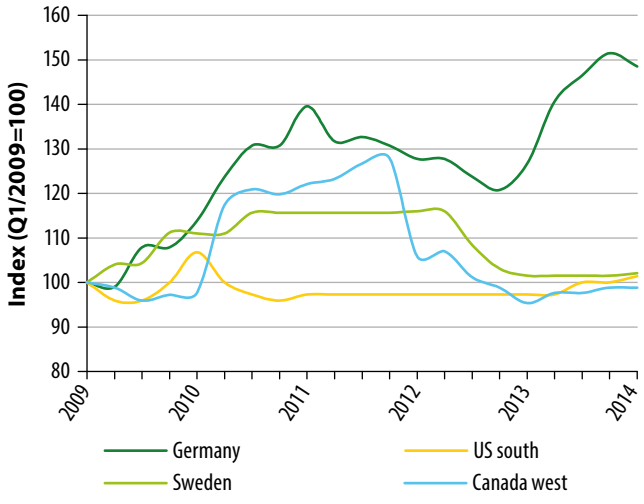


Note: Indices are based on delivered log price per oven-dry tonne in US dollars.
Source: WRI, 2014b.

The two global wood-fibre indices, the Softwood Fibre Price Index (SFPI) and the Hardwood Fibre Price Index (HFPI), trended in opposite directions for most of 2013. The SFPI was at $99.51 per oven-dry tonne in the last quarter of 2013, somewhat higher than earlier in the year but lower than in 2012. Price trends for wood chips and softwood pulplogs varied by source, declining in Latin America, North America and a few markets in Europe, including Norway, the Russian Federation and Sweden but increasing in Finland and much of central and southern Europe (graphs 4.6.5 and 4.6.6).

GRAPH 4.6.5

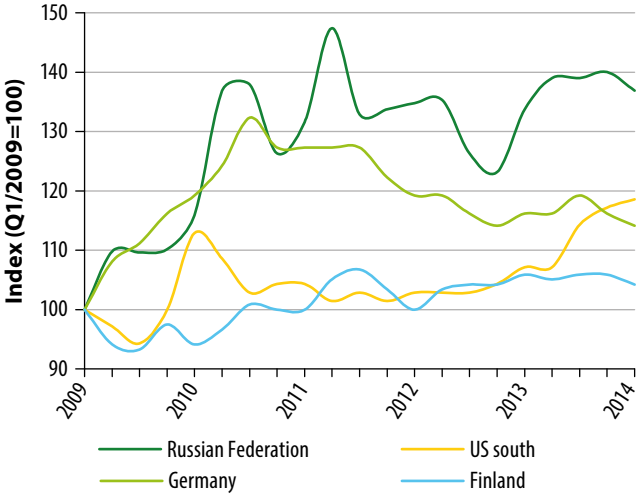
Softwood chip price indices, selected countries, 2009-2014



Note: Indices are based on delivered wood chip price per oven-dry tonne in local currencies.
Source: WRI, 2014b.

GRAPH 4.6.6

Softwood pulplog price indices, selected countries, 2009-2014



Note: Indices are based on delivered log price per oven-dry tonne in local currencies.
Source: Source: WRI, 2014b.

The HFPI has fallen steadily for nearly two years, reaching its lowest level since 2009 in late 2013. In the last three months of 2013, the HFPI was $97.59 per oven-dry tonne, down by 18% from its peak in 2011. The biggest price declines were in Asia and Latin America, while wood costs in Europe, North America and the Russian Federation were almost unchanged in 2013.

Wood-fibre cost accounted for just over 59% of worldwide production cost in the last three months of 2013, down from about 63% in late 2011 but up from 51% in 2006 (Fisher International, 2014).

Source: UNECE/FAO, 2014.

Note: The statistical annex of the Forest Products Annual Market Review 2013-2014 is available at: www.unece.org/forests/fpamr2014-annex.html

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5 SAWN SOFTWOOD

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HIGHLIGHTS

- Sawn softwood consumption rose by 5.2% in North America in 2013 and by 8.8% in the CIS. In Europe, however, demand dropped for the third consecutive year, by 1.7%.
- There was no clear trend in the individual sawn softwood markets of European countries in 2013, with some showing healthy growth and others still struggling in the face of the European debt crisis.
- Of the European countries, Germany, Sweden and the UK recorded the greatest consumption gains, by volume, in 2013. The Czech Republic, France, Portugal and Spain recorded the largest falls.
- Demand from markets outside of the subregion pushed European production higher by 1.3%, and total exports increased by 5.6%. Export markets are becoming more important for the European sawn softwood industry, especially those of China, Japan and Middle Eastern/North African countries, the latter led by Egypt.
- Prices for European sawn softwood (both domestic and export) increased modestly, lifting slightly the overall profitability of the industry.
- Fuelled by strong export demand, sawn softwood production in the CIS rose by 4.0% in 2013, to 35.8 million m^3, primarily as a result of a 3.9% increase in production to 31.2 million m^3 in the Russian Federation.
- The weighted average of Russian sawnwood prices was 25% higher in 2013 than in 2012 as a result of strong market demand coupled with the rouble's lower exchange rate.
- The US new residential housing market is recovering, and with favourable activity in the repair and renovation markets in 2013, this led to a 4.5% increase in North American sawn softwood consumption compared with 2012, reaching 80.3 million m^3. A similar increase is expected in 2014.
- North American sawnwood prices are expected to continue their volatility in 2014: they declined between April and June 2013, increased steadily to March 2014, and declined again in April-June 2014.
- China has become a key alternative market for sawnwood producers, with Canada (6.8 million m^3), Europe (1.3 million m^3) and the US (875,000 m^3) all exporting record volumes there in 2013.

5.1 INTRODUCTION

In line with generally "improving but unsettled" global economic trends, 2013 was characterized by recoveries in North America and the CIS countries. The situation across Europe could be described more as "unsettled to improving".

Sawn softwood consumption increased in North America (5.2%) and the CIS (8.8%) in 2013. Europe recorded a third consecutive drop (of 1.7% in 2013) in apparent consumption, as some countries in the subregion continued to struggle economically (table 5.1.1). There were production gains in all regions: North America (5.2%); CIS (4.0%); and Europe (1.3%).

In general, trends in this chapter are discussed at the UNECE regional and subregional levels, however, trends for other country aggregations are occasionally discussed, such as: the European Union (EU), the Nordic countries, etc.

TABLE 5.1.1

Apparent consumption of sawn softwood in the UNECE region, 2012-2013

	(1,000 m^3)				
	2012	*2013*	*Change (%) 2012-2013*	*Change (%) 2009-2013*	*m^3/capita (2013)*
Europe	84,630	83,220	-1.7	3.5	0.13
North America	76,363	80,328	5.2	20.3	0.24
CIS	17,872	19,438	8.8	29.6	0.07
Total	178,866	182,986	2.3	12.8	0.17

Source: UNECE/FAO, 2014.

5.2 EUROPE

5.2.1 Consumption

The European market for sawn softwood showed a wide spectrum of results in 2013. Some countries clearly underperformed, while others experienced dramatic growth. Europe-wide, total apparent consumption dropped by 1.7% in 2013 compared with 2012, although the decline was less than the projected drop in total construction output in major European markets (Euroconstruct, 2013). The total apparent consumption in Europe was reported at 83.2 million m^3, which is still low compared with historical levels (table 5.2.1). Nevertheless, combined with increasing overseas exports, 2013 was a year of improvement for the sawn softwood industry.

TABLE 5.2.1

Sawn softwood balance, Europe, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	96,608	97,888	100,456	1.3
Imports	31,809	31,570	32,127	-0.8
Exports	43,787	46,237	47,309	5.6
Net trade	11,978	14,513	15,182	
Apparent consumption	84,630	83,220	85,273	-1.7

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

Both Germany and the UK increased consumption in 2013 by 850,000 m^3, to a combined total volume of 26.7 million m^3. UK consumption grew by 5.9%, which was a much higher increase than in most European countries. Other good performers were Sweden, with a 6.5% increase, and Romania, which broke the 1 million m^3 mark for the first time with a 22% increase in consumption (due partly to the greater use of sawn softwood in the manufacture of value-added products for export markets).

Poor performers in Europe were the Czech Republic, France, Portugal and Spain (where the drop in consumption was the highest in terms of absolute volume). In France, the percentage decrease in consumption was relatively mild compared with the dramatic declines in the other three countries. The recent period of growth in Turkey ended in 2013, with consumption dropping by 3%; nevertheless, Turkey remained in the "5 million m^3 club" and was the fifth-largest European sawn softwood consuming country in 2013.

There have been only minor changes in the market structure in Europe in recent years, with Germany still the largest consumer of sawn softwood, followed by the UK, which has overtaken France. First-quarter indications are promising for 2014. The major European exporting countries (Finland, Germany and Sweden) are all reporting clear increases in export volumes to nearly all other European countries compared with the corresponding period in 2013.

5.2.2 Production and capacity change

As European demand stabilized and exports outside of the subregion increased, sawn softwood production grew by 1.3% in Europe, to 97.9 million m^3. This positive development was due mainly to increased production in Finland, Poland and Romania, which collectively added 1.3 million m^3 of production, with Finland alone increasing production by 800,000 m^3 (and thereby producing more than 10 million m^3 for the first time since 2007). Germany and the UK also increased production. On the other hand, combined production in Austria and the Czech Republic dropped by 1.5 million m^3 between 2010 and 2013, and further decreases can be expected because some

mills curtailed production in the first half of 2014. Log prices in those two countries are among the highest in the world; moreover, their landlocked nature restricts their access to growing overseas markets, making them more dependent on European markets.

No major permanent capacity closures occurred in Europe in 2013 and the first half of 2014, although some smaller sawmills ceased production. Given the current unsettled market conditions, there is still no need for additional new capacity. On the other hand, if demand in Europe picks up and overseas markets continue to grow, there could be mid-term opportunities to add capacity. There is an air of optimism in the subsector, with some private companies acquiring additional capacity and private-equity companies investing in sawmilling.

5.2.3 Prices

Sawnwood softwood prices in Europe and the Middle East (based on CIF prices that include insurance and ocean freight costs delivered to markets or foreign ports) increased by 3-5% in 2013 over 2012, and they further improved slightly in the first five months of 2014. With reasonable price increases and greater use of capacity, sawmills with access to export markets improved their profitability. European mills were profitable, on average, in 2013 (an improvement over 2012); profit margins were low, however, and finance for capital investment remains difficult.

Prices stabilized in Japan in 2013, after dropping in 2012. Continued stagnant prices in Japan reflect the current market situation there (graph 5.2.1).

Despite increasing prices in North America, European suppliers are not attracted to this market, reflecting a combination of current prices and the strengthening of the euro against the US dollar. On the other hand, increasing demand and prices in China in 2013 helped increase exports from Europe to China.

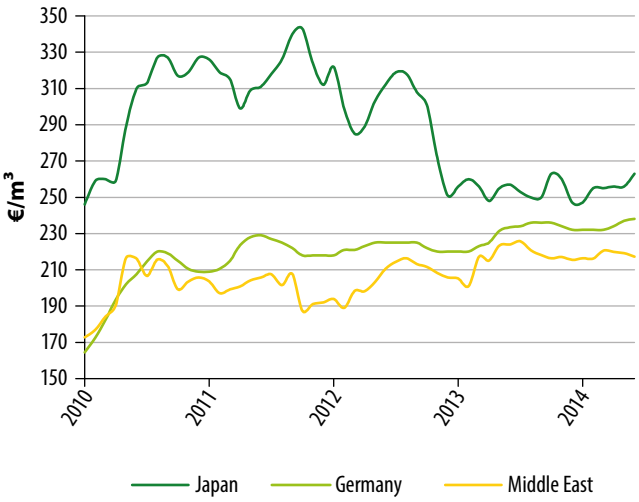
5.2.4 Trade

5.2.4.1 Imports

Europe is characterized by significant intra-regional trade. European production has grown faster than consumption, limiting the need for imports from outside the subregion. Europe imported 31.6 million m^3 in 2013, 0.8% less than in 2012. In 2013, the EU28 imported around 5 million m^3 from outside the EU, mainly from Belarus, the Russian Federation and Ukraine. Smaller volumes were also imported from overseas sources such as Chile, New Zealand and North America.

GRAPH 5.2.1

European sawn softwood prices in Japan, Germany and the Middle East, 2010-2014



Notes: 2014 data are to June. Japan: Finnish whitewood KD genban, #5&Btr, FOB; Germany: roof-framing sawnwood, delivered; Middle East: Scandinavian/Baltic whitewood and red pine, sixths, CIF.
Sources: EUWID Wood Products and Panels, 2010-2013; Japan Lumber Report, 2012-2014; Wood Markets Monthly, 2014.

5.2.4.2 Exports

European exports increased by 5.6% in 2013, to 46.2 million m^3. Of this, more than 19.6 million m^3 were exported from the EU to overseas markets (42% of total trade).

In 2013, Japan overtook Egypt as the largest overseas export market for European producers, with a volume of 3.3 million m^3, an increase of 27% compared with 2012. Exports to Egypt dropped by 12%, mainly due to political instability there. Exports from European sawmills to China tripled in 2013 compared with 2012, reaching 1.3 million m^3. Other important overseas markets, mainly North African countries, remained stable.

Data on first-quarter 2014 exports of European sawn softwood indicate that demand is picking up in Egypt and other North African countries but has become sluggish in Japan. Exports to China continue to grow, but not as rapidly as in 2013. The Republic of Korea is also growing as a market for European suppliers, with exports nearly doubling in 2013, to 0.2 million m^3, and first-quarter 2014 export data indicating similar growth in 2014.

5.3 CIS, WITH A FOCUS ON THE RUSSIAN FEDERATION

5.3.1 Consumption

Apparent sawn softwood consumption in the CIS increased by 8.8% in 2013, to 19.4 million m³ (table 5.3.1).

TABLE 5.3.1

Sawn softwood balance in the CIS, 2012-2014

	(1,000 m³)			
	2012	2013	2014f	Change (%) 2012-2013
Production	34,408	35,781	36,296	4.0
Imports	4,612	5,041	5,041	9.3
Exports	21,148	21,385	21,687	1.1
Net trade	16,536	16,343	16,646	
Apparent consumption	17,872	19,438	19,650	8.8

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

5.3.2 Production/capacity change

The total production of sawn softwood in the CIS was 35.8 million m³ in 2013, up 4% from 2012.

Fuelled by strong export demand, the volume of sawn softwood production in the Russian Federation increased by 3.9% in 2013, to 31.2 million m³. Production was stimulated by the opening of several new production facilities, as well as by the weakening of the rouble against the euro and the US dollar towards the end of 2013 and in early 2014.

Some notable investments have been made in the sawmilling sector in the Russian Federation. One of the largest sawmills in the Irkutsk region, JSC "LDK Igirma" (part of the Russian Timber Group), has modernized its mill; production there was nearly at full capacity (350,000 m³/year) in 2013.

Tsiglomen JSC «Sawmill 25» (a Titan Group company in the Arkhangelsk region of the Russian Federation) commenced operation in August 2013, creating 500 new jobs. The volume of sawlogs processed at Sawmill 25 increased by 35% after the commissioning of the new production site, to 1 million m³/year, with sawnwood production increasing to about 500,000 m³/year.

5.3.2.1 Prices

According to Rosstat (2014), the weighted average of Russian sawnwood producers' prices in 2013 was 6,268 roubles/m³ ($179/m³), a 25% increase over 2012 (graph 5.3.1). This growth can be explained by strong demand (both export and domestic), coupled with currency exchange-rate gains.

GRAPH 5.3.1

Sawn softwood prices in the Russian Federation, 2010-2014

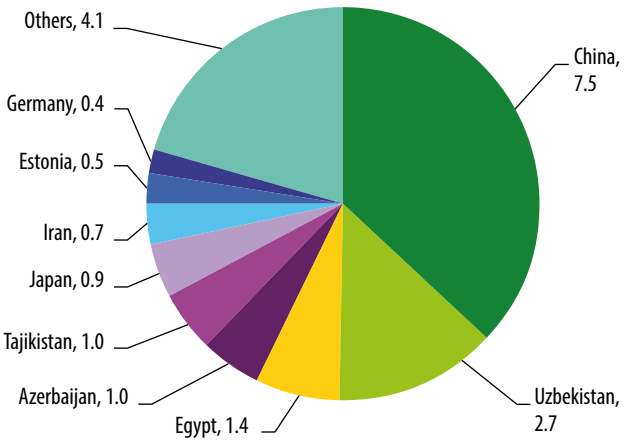
Note: Data to April 2014.
Source: Rosstat, 2014.

5.3.2.2 Trade

China remained the largest export market for Russian sawn softwood, with shipments increasing by 21.5% in 2013, to 7.5 million m³, with a total value of $894 million (or $119/m³) at the Russian-Chinese border. Other key market gains, by volume, were: Azerbaijan (+16%, to 1.0 million m³); Japan (+24%, to 946,000 m³); Tajikistan (+14%, to 955,000 m³); and Uzbekistan (+28%, to 2.66 million m³) (graph 5.3.2)

GRAPH 5.3.2

Russian Federation sawn softwood exports, by market, 2013

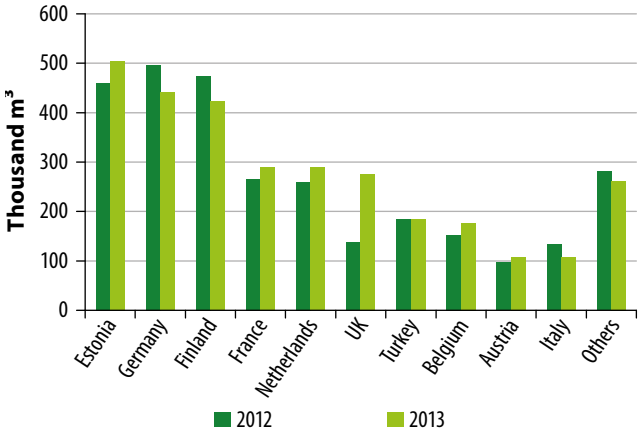


Source: WhatWood, 2014.

Russian exports of sawn softwood to Europe increased by 4% in 2013, to 3.1 million m³. The largest growth was in the UK, where imports almost doubled, to 276,000 m³. Exports to Estonia increased by 10%, to 504,000 m³. On the other hand, exports to Germany and Finland both fell by 11%, to 440,000 m³ and 422,000 m³, respectively (graph 5.3.3).

GRAPH 5.3.3

Russian Federation sawn softwood exports to Europe, 2012 and 2013



Sources: WhatWood, 2012.

5.4 NORTH AMERICA

5.4.1 Consumption

Trends in the North American lumber market in 2013 continued into the first half of 2014. US housing starts continued to increase from their 2009 low, albeit slowly (more information on housing markets can be found in Chapter 11). Single-family housing starts are the key driver of the lumber and building-materials industry, and US wood products' consumption is therefore still well below previous levels.

US GDP increased by 2.6% in 2013 but decreased at an annualized rate of 2.9% in the first quarter of 2014, primarily due to declines in private inventory investment (production minus sales), exports, state and local government spending, and residential and non-residential fixed investment (US Bureau of Economic Analysis, 2014). Moreover, the unemployment rate remained stubbornly high, at 7.4% in 2013 and 6.5% in the first half of 2014 (US Bureau of Labor Statistics, 2014), compared with historical norms of 5%. The unemployment rate is decreasing, but most of the job increases are in part-time and contract work, which are not the type of jobs that encourage banks to grant mortgages.

As a result of gains in new residential housing starts, repairs and remodelling, North America's 2013 apparent consumption of sawn softwood increased by 5.2% over 2012, to 80.3 million m³ (table 5.4.1). US apparent consumption increased by 7.1%, to 66 million m³, while Canada's apparent consumption slowed to 14.4 million m³ (-2.6%) because of a deceleration in housing construction.

TABLE 5.4.1

Sawn softwood balance, North America, 2012-2014

	(1,000 m³)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	88,034	92,604	93,938	5.2
Imports	17,389	20,003	20,212	15.0
Exports	29,060	32,279	33,741	11.1
Net trade	11,671	12,276	13,529	
Apparent consumption	76,363	80,328	80,459	5.2

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

5.4.2 Production/capacity change

US sawn softwood output in 2013 was 51.1 million m³, a 4.7% increase over the 48.8 million m³ recorded in 2012. Production gains were spread evenly across the US, with all regions increasing outputs. Of the country's two biggest lumber regions, however, the US West had the largest increase (over 6%) as compared to the US South (slightly below the national increase). Growing sawnwood demand throughout the supply chain enabled mills to increase their operating rates (i.e. production as a percentage of practical capacity) in 2013: mills in the US West operated at 81% capacity (compared with 76% in 2012) and mills in the US South operated at 83% (compared with 80% in 2012) (Wood Markets Monthly, 2013-2014).

Source: UNECE/FAO, 2013

The three regions in the US West all achieved positive but differing results. US mills in closer proximity to the west coast ports faced higher log costs driven by strong log exports to China, but the US West coast region (Washington and Oregon) still increased sawn softwood output by 5.5% in 2013. Higher production increases occurred in the US Inland (eastern side of the US West; 6.2%) and the California region (13.9%) because few logs are exported from these other two regions.

Canada's sawn softwood production rose at a faster rate than in the US in 2013, despite negative domestic market growth. Output was 41.6 million m³ in 2013, compared with 39.3 million m³ in 2012, an increase of 5.8%. The province of British

Columbia accounts for about 52% of Canada's lumber output, but the mountain pine beetle epidemic in the province's interior has curtailed production increases. Economic viability is marginal for the processing of standing beetle-killed timber that is more than 10 years old. Even though much of the resource is now over that age, the British Columbia interior still recorded a slight increase (2.5%) in sawn sawnwood production in 2013 (Wood Markets Monthly, 2013-2014).

There has been huge erosion in the competitive position of the sawn softwood industry in eastern Canada; 2013 was only the second year since 2004 in which an increase in production has been recorded. This decline in the competitive position has led to the closing of many older, higher-cost mills. An ongoing challenge for sawmills in the province of Quebec has been the government's reductions in the sustainable timber harvest, which has permanently reduced the province's timber harvest by 35% since 2004 (Wood Markets Monthly, 2013-2014). Nevertheless, sawn softwood production increased by 8.4% in eastern Canada in 2013 as markets improved.

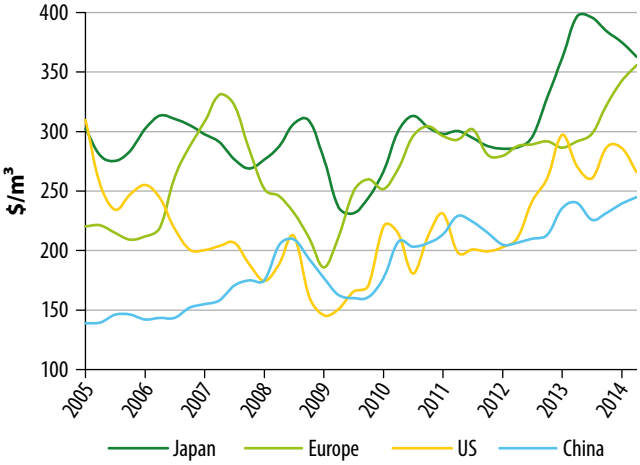
5.4.3 Prices

Improving demand and supply-chain dislocations in key markets created price volatility in 2013 and during the first half of 2014. North America continues to experience railcar and trucking shortages, badly affecting mill inventories (i.e. leading to increased stocks of finished inventories) and delaying deliveries to markets. Strong demand in China and Japan in 2013 tightened the North American sawnwood supply, creating price spikes in the US in the second quarters of both 2013 and 2014 (graph 5.4.1). This tight supply was caused by major winter storms in the eastern half of Canada and the US in the first quarters of both years, which slowed deliveries and created huge stocks at sawmills. A 30-day port strike in Vancouver, British Columbia, in the first quarter of 2014 blocked shipments to China and Japan from Canadian mills, leading to the diversion of sawn softwood to the US market (Wood Markets Monthly, 2013-2014). This maintained price tension in Asia but negatively affected (reduced) US prices.

The prospect of additional transportation constraints, poor weather, fluctuating export markets and other dynamics suggests that prices will continue to be volatile. The outlook for the remainder of 2014 is for improving prices in the US market, but this will depend heavily on the rate of new residential construction – something that has been almost impossible to predict for the last five years.

GRAPH 5.4.1

Sawn softwood quarterly prices in Japan, Europe, US and China, 2005-2013



Notes: Data to March 2014. China: SPF/Hem-Fir, green, #3&Btr 1-7/8x4-12, CIF. Delivered-to-market prices. Europe: Swedish spruce 47x100, CIF. Japan: BC W-SPF 2x4, J-grade, CIF. US: W-SPF #2&Btr, 2x4, delivered to Chicago.

Sources: Wood Markets Monthly, 2013-2014; Wood Markets China Bulletin, 2014.

5.4.4 Trade

Japanese reconstruction following the tsunami in March 2011 regained momentum in 2013, with sawn softwood exports from both Canada and the US increasing by over 10%. In the second quarter of 2014, however, exports from Canada plunged by 34%, while US exports eased by 1%. One possible cause of a decline in exports from both countries was an increase in the consumption tax in Japan from 5% to 8% in April 2014, the first increase in the tax since 1997. The significantly larger decline in exports from Canada may have been caused by the port strike in British Columbia or other factors.

China's sawn softwood imports surged in 2013, to 16.9 million m^3, following a modest slowdown in 2012 (14.2 million m^3). Canada (mainly British Columbia) exported 6.8 million m^3 to China in 2013, and the US (the West and South regions combined) exported 875,000 m^3 (Wood Markets China Bulletin, 2014). Despite the gains in 2013, the Chinese construction industry slowed in early 2014 due to an oversupply of residential housing units and lower demand. This reduced demand for sawn softwood, and prices fell back from near-record highs in the first quarter of 2014 (Wood Markets China Bulletin, 2014). Demand for sawn softwood in China is now expected to be relatively flat for the foreseeable future (but at high volume levels) because overall housing inventory and prices remain high and buyers are waiting to see if a property correction occurs.

5.4.4.1 Imports

Canadian supply dominates US imports of sawn softwood, commanding almost 97% of the import market in 2013. Canadian shipments to the US were 18.6 million m^3 in 2013, 14.5% higher than in 2012 (Wood Markets Monthly, 2013-2014).

5.4.4.2 Exports

North American producers had slightly higher (+5.2%) offshore exports in 2013 than in 2012, at 9.0 million m^3. Total exports, including trade between Canada and the US, increased by 11.1%, to 32.3 million m^3 (table 5.4.1) (Wood Markets Monthly, 2013-2014). With increasing demand and generally higher prices in 2013, both export and domestic markets enabled a strong performance by North American mills.

Rising demand and prices in Japan also led to an increase (of 10.5%) in the volume of North American exports to that country. Exports to China increased by an even greater amount – 61.6% from the US and 5.1% from Canada – following a major rebound in construction activity.

The North American outlook for the second half of 2014 is uncertain – as it also was one year ago. A major price correction occurred in the second quarters of both 2013 and 2014, but the expectation is for a gradual improvement in North American sawn softwood consumption and prices, led by growth in new US residential construction. Further growth may come from a resurgence in demand from China, Japan and other Asian markets.

5.5 EXTRA-REGIONAL INFLUENCE ON THE UNECE REGION

Outside the UNECE region, China's sawn softwood imports recovered in 2013 from a marginal (5%) drop in 2012, when government measures, introduced to control the real-estate bubble in major eastern cities, were in effect. In 2013, sawn softwood imports into China increased by 19% as China's GDP growth recovered in the second half of 2013 and as government policies focused on domestic sources of growth. Government-subsidized affordable housing schemes have stimulated a sharp increase in domestic demand for wood-based products. China's economic growth is expected to remain broadly unchanged in 2014-15, with continued high demand in the construction sector. However, economic risks have been identified arising from over-investment and a credit boom, which may affect sawn softwood prices and demand in the medium term (IMF, 2014). China's sawn softwood imports are used mainly in housing and construction, a different market segment from tropical and temperate hardwoods, which are used mainly in furniture and interior decoration. China's imports in 2013 were predominantly from UNECE sources, with Chile and New Zealand the only significant competitors from outside the UNECE region.

Japan's demand for imported sawn softwoods has followed a trend similar to China, recovering in 2013 after a drop in 2012. In 2013, housing starts surged before a two-step increase in the consumption tax rate starting in the second quarter of 2014. Housing starts are expected to rise further, by 10%, in the fourth quarter of 2015. Reconstruction and new construction spending arising from the 2011 Japan earthquake and tsunami also gained momentum and led to increased demand and prices for building materials. Demand for imported sawn softwoods was expected to decline marginally in the second quarter of 2014. Japan's tightening fiscal policy stance in 2014-15, the unwinding of reconstruction spending, and the stimulus package of the "Abenomics"[12] programme are expected to affect construction activity and sawn softwood demand. The Japanese government introduced the Wood Use Points Programme in 2013, designed to provide domestic forestry and sawmilling industries with a competitive advantage by subsidizing the use of domestically grown wood species. North American Douglas fir and European whitewood have been selected as qualified species for the programme (oddly, given the fact that these species are imported), providing them with a competitive advantage over other imported sawn softwoods.

North African and Middle Eastern countries – particularly Egypt, Saudi Arabia and the United Arab Emirates – continued to be major markets for sawn softwoods, with Saudi Arabia's imports increasing by more than 50% in 2013.

The only significant exporters of sawn softwoods outside the UNECE region in 2013 were Brazil, Chile and New Zealand. New Zealand's major markets are within the Asia-Pacific region – Australia, China, the Republic of Korea, Taiwan Province of China, Thailand, the US and Viet Nam. Chile's export markets are more diversified, with significant volumes shipped to Asian, Latin American and Middle Eastern markets (table 5.5.1). Although the volume of New Zealand's roundwood harvest and log exports has increased dramatically in recent years, domestic sawnwood production and exports have been relatively static. High log demand and log export prices in China have led to intense competition and restrictive prices on the supply of logs to sawmills in New Zealand.

TABLE 5.5.1

Major importers and exporters of sawn softwood outside the UNECE region, 2012-2013

	(million m^3)		
	2012	*2013*	*% change 2012-2013*
Major importers			
China	14,221	16,911	18.9
Japan	6,289	7,245	15.2
Egypt	3,277	2,989	-8.8
Saudi Arabia	987	1,568*	58.9
Republic of Korea	1,306	1,520	16.4
Major exporters			
Chile	2,851	3,110	9.1
New Zealand	2,113	2,646	25.2
Brazil	684	716	4.7
China	194	194	0.0

Note: *Estimate based on sum of reported exports to Saudi Arabia by exporting countries.

Sources: Comtrade 2014; Global Trade Atlas, 2014.

[12] Abenomics comprises a mixture of reflation, government spending and a growth strategy designed to jolt the economy out of the suspended animation (The Economist, 2013).

Source: UNECE/FAO, 2013

5.6 POLICY AND REGULATORY INFLUENCES ON THE SECTOR

The US-Canada Softwood Lumber Agreement, signed in 2006, was extended in early 2012 and will remain in effect until 12 October 2015. Under the Agreement, export duties are paid on a graduated basis by Canadian exporters to the US when sawn softwood prices fall below the threshold level of $355/thousand board feet ($222/m^3) net, as set by the Framing Composite Index price (Random Lengths, 2014). Stronger demand and prices have eliminated this tax, with the exception of one month in mid-2013.

Under the US-Canada Softwood Lumber Agreement, the Bi-National Softwood Lumber Council (BSLC) continues to support a number of carefully selected projects targeting growth in sawn softwood demand. The BSLC provides the funds needed to enable such projects and programmes to proceed and to take root. Its activities have encouraged increased collaboration between individual regional and product-based associations with the aim of producing more synergistic and strategically aligned industry programmes.

The sourcing of wood from sustainably managed forests (including certified sources) continues to be a requirement of many retailers and other purchasers in Europe, North America and other countries.

The requirement in Europe for the CE-marking of sawnwood (and all construction products in general) took effect on 1 July 2013. The market impact of this initiative has been small; it is limited to a few exporters and some small-scale sawmills that lack the equipment or resources to maintain CE-marking (European Commission, 2014).

Note: The statistical annex of the Forest Products Annual Market Review 2013-2014 is available at: www.unece.org/forests/fpamr2014-annex.html

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6 SAWN HARDWOOD

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HIGHLIGHTS

- The dramatic shift in sawn hardwood trade flows away from the UNECE region towards emerging economies, which began during the global financial crisis, slowed in 2013.
- Following two years of decline in 2011 and 2012, demand for sawn hardwood in the UNECE region began to recover in 2013, with consumption rising by 5.1%, to 31.5 million m^3.
- European consumption of sawn hardwood fell by 3.9% in 2013, to 12.3 million m^3, due partly to low economic and construction activity and partly to a lack of supply because hardwood was diverted to more active markets in Asia and North America. European consumption was forecast to recover modestly in 2014.
- Sawn hardwood consumption in the CIS increased by 12% in 2013, to 2.1 million m^3. Production increased by 2%, boosted by inward investment in the Russian Federation's sawmill industry and rising demand from that country's buoyant residential construction sector.
- Prices for many specifications of sawn hardwood rose in 2013 and the first half of 2014 as supply failed to keep up with rising demand in Asia and North America.
- China dominated the global trade in sawn hardwood in 2013, with imports growing by 11%. By June 2014, however, China was showing signs of market saturation, and more sawn hardwood was available for other markets.
- Over-exploitation of Mongolian oak and Manchurian ash led to the CITES listing of both species on 24 June 2014 at the request of the Russian Federation. These listings are expected to reduce significantly those species' availability for export to China.
- North American sawn hardwood consumption increased by 11.9% in 2013, to 17 million m^3; it was forecast to continue rising in 2014 as increasing construction and remodelling activity boosted US demand across all hardwood use categories.
- North American sawn hardwood production was 19.5 million m^3 in 2013, an 11.4% gain on the previous year. Production in the first half of 2014 was also significantly higher than in the same period in 2013.
- Exports of US sawn hardwood to countries outside North America increased by 14% in 2013, to 2.85 million m^3, the highest-ever recorded level. Growth was concentrated in China, Southeast Asia and Mexico.

6.1 INTRODUCTION

There was a significant shift in sawn hardwood trade during the global financial crisis away from the UNECE region and towards emerging economies, but this trend slowed in 2013 as demand in the UNECE region began to recover. Total apparent consumption of sawn hardwood across the UNECE region was 31.5 million m^3 in 2013, up by 5.1% from 2012. This increase followed a decline in 2011 and a flat 2012 and was driven primarily by rising demand in the US.

Sawn hardwood production increased in North America and the CIS in 2013 but declined in Europe (due mainly to log shortages in parts of eastern Europe). The 2012 downturn in imports in the UNECE region continued into 2013, but at a slower pace. After four years of increase, exports in the UNECE region stabilized in 2013.

6.2 EUROPE

6.2.1 Consumption

European consumption of sawn hardwood fell by 3.9% in 2013, to 12.3 million m^3, due partly to a lack of supply because hardwood was diverted to more active markets in North America and emerging economies (table 6.2.1).

TABLE 6.2.1

Sawn hardwood balance, Europe, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	12,901	12,377	12,585	-4.1
Imports	4,926	4,761	4,859	-3.3
Exports	4,975	4,793	4,877	-3.7
Apparent consumption	12,852	12,345	12,567	-3.9

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

Consumption in Europe was also constrained by slow economic and construction activity. The Eurostat index of construction production in the EU bottomed out in March 2013 and staged only a slow and faltering recovery thereafter. Joinery and furniture, two subsectors that drive sawn hardwood demand, followed the construction trend. The Eurostat seasonally adjusted index of wood-joinery activity in the EU was static at a low level in the first nine months of 2013 and then fell sharply in the final three months of the year. Activity picked up only a little in January-March 2014. The Eurostat index of furniture production in the EU fell in 2012 and the first quarter of 2013 before stabilizing for the rest of that year. The furniture production index increased in the first quarter of 2014 for the first time since 2011 (Eurostat, 2014).

According to the European Federation of the Parquet Industry (FEP), wood-flooring production in the 17 FEP countries[13] declined by 1.8% in 2013, to 67 million m^2, substantially below the peak of over 100 million m^2 in 2007. In 2013, oak accounted for 70.9% of wood-flooring production in FEP countries, up slightly from 69.6% in 2012, while the share of tropical wood fell from 6.2% to 5.8%. The shares of total wood-flooring production attained by ash (5.1%), beech (4.6%) and maple (1.6%) were all slightly lower in 2013 than in 2012 (FEP, 2014).

Source: AHEC, 2014.

Hardwood sawmills in Germany reported stable demand in the European furniture sector in 2014 but weak demand in the flooring sector (EUWID, 2014a). French sawmills reported weakening demand for oak for flooring, furniture and garden products in 2014. Demand for beech in the domestic furniture sector in France was also slow in the first half of 2014, but there was growing demand for pallet-grade sawn hardwood (EUWID, 2014b). Hardwood sawmills in Romania reported strong demand for oak (in long lengths with rustic finishes) in the European flooring industry in 2014. European demand was stable at a low level for smaller-dimension Romanian oak and slow for Romanian beech (EUWID, 2014c).

6.2.2 Production and capacity change

European sawn hardwood production declined by 4.1% in 2013, to 12.4 million m^3. The largest drops in production were in Croatia, Romania and Turkey, mainly due to reduced log availability. Production was stable in France and increased slightly in Germany.

An annual review of wood-industry investment in Europe in 2013 indicated that the pace of closures in the hardwood sawmilling sector in western Europe slowed last year (EUWID, 2014d). In fact, a limited number of sawmills resumed or expanded operations in 2013.

[13] FEP countries includes: Austria, Belgium, Croatia, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, The Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland and Turkey.

While some subsectors of the European hardwood industry benefited from inward investment in 2013, others continued to face major challenges. Twenty-five percent of hardwood sawmills in southeastern Europe closed in 2010-2013. Many such sawmills are small and depend on outdated technology, and they lack the resources to educate and retain staff. They have struggled to secure sufficient raw material because logs are being diverted to export markets and for biomass (CWC, 2014).

6.2.3 Prices

European sawn oak prices were stable in the first half of 2013 but began to rise in the second half of the year as demand increased from Asian flooring manufacturers. This increase in Asian demand was driven partly by the increasing scarcity – and therefore rising prices – of American white oak, which led Asian manufacturers to turn to European oak. Oak prices continued to rise in the first half of 2014, but the trend had slowed by mid-year. Prices rose more rapidly for oak logs than for sawn oak, with the result that margins continued to narrow in the sawmilling sector (EUWID, 2014a, 2014b).

Prices for sawn beech were generally static at low levels in 2013, in the face of low demand. However, price increases were registered for some specifications of sawn beech towards the end of 2013 in response to rising demand, particularly in China and North America. In 2014, German sawmills pushed through price increases of up to 4% for 12-month contracts to supply beech to China (EUWID, 2014a, 2014b).

6.2.4 Trade

6.2.4.1 Imports

European countries imported 4.8 million m^3 of sawn hardwood in 2013, down by 3.3% from 2012. A significant proportion of this volume consisted of intra-regional trade. Italy was the largest importer of sawn hardwood in Europe, at 717,000 m^3 (although this volume represented a 2.4% decline compared with 2012). The UK was the second-largest importer, with trade rising by 3.1% in 2013, to 436,000 m^3. Imports into Germany, the third-largest import market, declined by 8.5% in 2013.

In terms of purely external trade, the EU28 countries imported 1.85 million m^3 of sawn hardwood from non-EU countries in 2013, 8% less than in 2012. EU sawn hardwood imports were divided almost equally between temperate and tropical sources in both 2012 and 2013. The EU imported 928,000 m^3 of sawn temperate hardwood in 2013, down by 8% from 2012. Imports were stable from the US, the largest non-EU supplier, but declined from Belarus, Bosnia and Herzegovina, the Russian Federation and Ukraine. The EU imported 918,000 m^3 of sawn tropical wood in 2013, down by 8% from 2012. Declining imports from Brazil, Cameroon, Ghana, Indonesia, Côte d'Ivoire and Malaysia were only partly offset by increases from the Republic of the Congo, the Democratic Republic of the Congo and Gabon (FII, 2014).

6.2.4.2 Exports

Europe exported 4.8 million m^3 of sawn hardwood in 2013, down by 3.7% from 2012. Romania was the largest exporter, with 728,000 m^3, although this was a decrease of 2.9% from 2012. A large proportion of Romania's exports of sawn beech have traditionally gone to Egypt's large furniture-manufacturing sector, but Romania's exports to Egypt fell by 16% in 2013 while its exports to China increased by 40%. Croatia was Europe's second-largest sawn hardwood exporter in 2013, with 625,000 m^3, a decrease of 8.9% compared with 2012, and the decline was particularly sharp for Egypt. Croatia's large sawn hardwood export volume to Italy, primarily oak, was steady in 2013. Germany's exports of sawn hardwood increased by 1.6% in 2013, to 585,000 m^3. That country's exports of sawn hardwood to China increased by 29% in 2013, but this gain was offset by an 18% fall in exports to Poland (FII, 2014).

6.3 COMMONWEALTH OF INDEPENDENT STATES

Apparent consumption of sawn hardwood in the CIS increased by 12% in 2013, to 2.1 million m^3. Production increased by 2% and exports declined by 11.8%. Imports increased by 12.8% but from a very low level (table 6.3.1).

Sawn hardwood production in the Russian Federation increased by 5% in 2013, to 2.3 million m^3, but exports decreased by 13%, to 748,000 m^3. Sawn hardwood exports to China were around 650,000 m^3 in 2013, 14% lower than in 2012 (Global Trade Atlas, 2014). This followed a big rise in such exports to China between 2009 and 2012, stimulated by the Russian Federation's introduction of log-export taxes and government incentive programmes such as the Priority Investment Programme, designed to encourage the growth of the domestic sawmill industry.

TABLE 6.3.1

Sawn hardwood balance, CIS, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	3,060	3,122	3,175	2.0
Imports	78	88	88	12.8
Exports	1,281	1,130	1,130	-11.8
Apparent consumption	1,857	2,080	2,133	12.0

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

The availability of the most commercially valuable Russian hardwood species exported to China has declined in recent years due to over-exploitation. According to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the illegal logging and uncontrolled trade of Mongolian oak and Manchurian ash (two valuable hardwood species) in the far-east provinces of Primorsky and Khabarovsky

has led to forest degradation in those provinces. Both timber species were listed in CITES Appendix III in June 2014 at the request of the Government of the Russian Federation (CITES, 2014).

Sawn hardwood consumption increased in the Russian Federation in 2013, driven by rising residential construction. The floor area of new residential construction in the Russian Federation increased by 6% in 2013, to 69.4 million m^2, the highest figure since 1989. Under the Provision of Affordable and Comfortable Housing Programme 2013-2020, annual housing construction levels are expected to increase gradually until 2020 (PMR, 2014).

Ukraine's production of sawn hardwood, mainly oak, fell by 4% in 2013, to 455,000 m^3, and exports fell by 6%, to 293,000 m^3. The share of Ukrainian sawn hardwood exports destined for EU countries declined from 77% in 2012 to 74% in 2013. This continued a long-term trend, with increasing volumes exported to Azerbaijan, Belarus, China, the Russian Federation, Serbia and Turkey (Global Trade Atlas, 2014).

6.4 NORTH AMERICA

6.4.1 Consumption

North American sawn hardwood consumption increased by 11.9% in 2013, to 17.1 million m^3 (table 6.4.1). Low mortgage rates, a better jobs market and higher consumer confidence bolstered home sales and led the US economic recovery in 2013 (Hardwood Review, 2013).

TABLE 6.4.1

Sawn hardwood balance, North America, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	17,476	19,476	19,448	11.4
Imports	1,373	1,493	1,515	8.7
Exports	3,593	3,903	3,969	8.6
Net trade	2,220	2,410	2,454	8.6
Apparent consumption	15,256	17,066	16,995	11.9

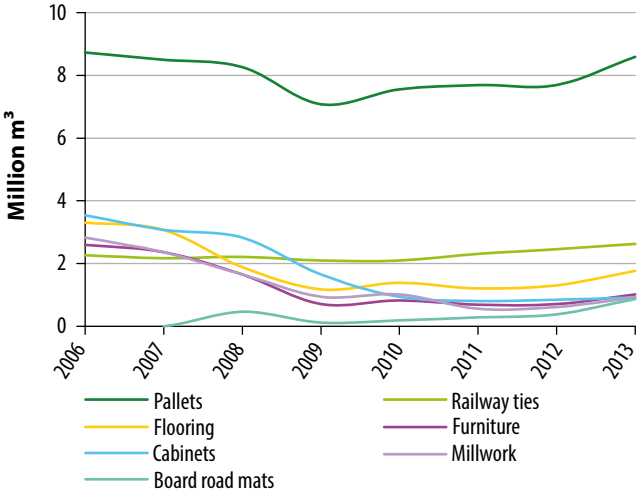
Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

Sawn hardwood consumption in the US was 15.6 million m^3 in 2013, 13% higher than in 2012 but still below the volume in 2010. Increasing construction and remodelling activity boosted US demand in all use categories in 2013 (graph 6.4.1).

US demand for sawn hardwood remained buoyant into 2014, despite severe weather conditions early in the year. The recovery in the US residential construction market continued to support sales growth. The National Association of Homebuilders forecast that the number of US housing starts would increase by 24% in 2014, from 924,000 to 1.145 million (NAHB, 2014). The outlook for the US repair and remodelling market remains positive, with growth of 10% forecast in 2014 (JCHS, 2014).

GRAPH 6.4.1

US sawn hardwood consumption, by market segment 2006-2013



Source: Hardwood Market Report, 2014.

Sawn hardwood consumption in Canada increased by 2.4%, to 1.3 million m^3, in 2013, despite declining construction activity. The Canadian Government intervened in 2012 to cool the housing market, which had reached record highs, by tightening mortgage lending rules. Canada's housing starts fell from 214,827 units in 2012 to 187,923 units in 2013 (Reuters, 2014). Canadian sawn hardwood consumption is expected to remain stable in 2014. Housing starts in 2014 are forecast to be similar to 2013, and growth in Canada's renovation and commercial construction markets is expected to be in line with inflation at around 2%.

Source: AHEC, 2014.

6.4.2 Production and capacity change

North American sawn hardwood production increased by 11.4% in 2013, to 19.5 million m^3. This increase was due to rising domestic consumption and exports and the depletion of inventories carried over from earlier years. Production in the first half of 2014 was also significantly higher than in the same period in 2013.

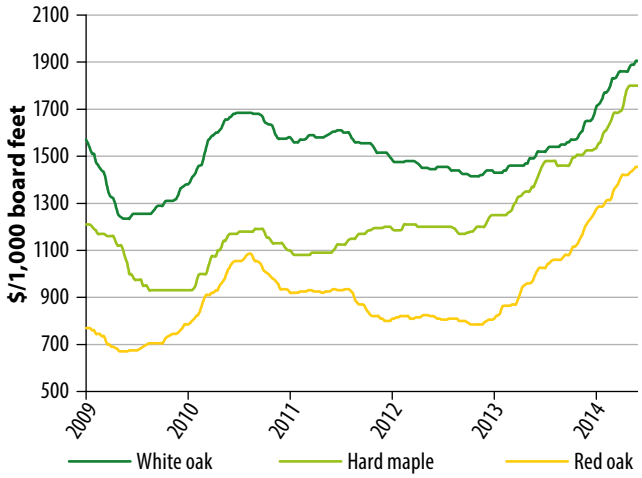
While US production has stepped up in 2014, several factors may moderate the pace of growth. Profitability in the hardwood processing sector has fallen because high-margin grade sawnwood markets declined more than low-margin industrial markets during the downturn. The very severe winter in 2013/14 reduced log stocks in most mills. Supply is also constrained in the short to medium term by a lack of loggers and other infrastructure for harvesting and transporting logs.

6.4.3 Prices

After a period of stability in the middle part of 2012, prices for kiln-dried US sawn hardwood increased between November 2012 and May 2014. Benchmark prices for Appalachian kiln-dried 4/4 FAS red oak were 28% higher in May 2014 than they were 12 months earlier (Hardwood Market Report, 2014) because supply could not keep up with rising consumption in North America, Asia and parts of Europe. The trend of increasing prices in this period is also reflected in the UNECE/FAO (2014) price series (graph 6.4.2). In May 2014, prices for US hardwoods had stabilized for some specifications (particularly thinner stock) and species (red oak, maple and tulipwood), but were still rising for less readily available species, such as white oak, black walnut and ash (Hardwood Market Report, 2014).

GRAPH 6.4.2

Prices for selected hardwood species in the US, 2009-2014



Note: Nominal prices. Data until May 30 2014.
Source: UNECE/FAO, 2014.

6.4.4 Trade

6.4.4.1 Imports

The Canada/US cross-border trade in sawn hardwood has increased in recent years. US imports of sawn hardwood from Canada were 304,000 m^3 in 2013, up by 23% from 2012. Canadian imports from the US were 597,000 m^3 in 2013, down by 1% from 2012 but still 6% higher than in 2011 (Global Trade Atlas, 2014).

In both 2012 and 2013, the US imported around 350,000 m^3 of sawn hardwood from outside North America. In both years, two-thirds of imports were tropical hardwoods and one-third was temperate hardwoods. Tropical hardwoods consist mainly of decking and flooring species from Brazil, Cameroon and Malaysia, and balsa from Ecuador. Small quantities of temperate hardwoods are sourced from China, Germany and the Russian Federation. Canada consistently imports only about 30,000 m^3 of sawn hardwood per year from outside North America, mainly from Brazil, Cameroon and Ecuador (Global Trade Atlas, 2014).

6.4.4.2 Exports

Exports of US sawn hardwood to countries outside the subregion were 2.85 million m^3 in 2013, up by 14% from 2012 and the highest level ever recorded. Exports to China/Hong Kong SAR were 1.5 million m^3 in 2013, up by 24% from 2012. Exports to Southeast Asia – mainly Indonesia, Malaysia, Thailand and Viet Nam – increased by 9% in 2013, to 492,000 m^3, another record. Exports to Mexico increased by 15%, to 266,000 m^3. After declining by 13% in 2012, sawn hardwood exports to European countries were steady – at 350,000 m^3 – in 2013 (AHEC, 2014).

Canada exported 154,000 m^3 of sawn hardwood to countries outside North America in 2013, up by 15% from 2012, including 70,000 m^3 to China/Hong Kong SAR (up by 56% from 2012) and 38,000 m^3 to the EU (up by 4%) (Global Trade Atlas, 2014). Canadian exports benefited from the depreciation of the Canadian dollar and the limited supply of US hardwoods.

6.5 EXTRA-REGIONAL INFLUENCE ON THE UNECE REGION

Outside the UNECE region, China continued to dominate the global trade of sawn hardwoods in 2013, with imports growing by 11% compared with 2012. The continuing rise in Chinese demand was a major factor driving supply shortages and price rises for sawn hardwood in 2013. By June 2014, however, there were signs of temporary saturation in the Chinese market, with the result that more sawn hardwood became available in other markets (Hardwood Market Report, 2014).

The global tropical sawn hardwood trade became even more concentrated in the Asia-Pacific region in 2013, with growth in China's imports compensating for continued low demand in North America and the EU. The major sawn hardwood importers outside the UNECE region were China, Malaysia, Taiwan Province of China, Thailand and Viet Nam. Malaysia, Indonesia and Thailand were the major exporters (ITTO MIS, 2014).

Thailand's sawn hardwood exports increased by 17% in 2013, comprising mostly plantation-grown rubberwood destined for China's furniture industry. Malaysia's sawn hardwood exports dropped marginally in 2013, with exports to Thailand (the major market) down by 27% and exports to China up 68%. Malaysia's exports picked up in the first quarter of 2014, with robust demand in Middle Eastern markets for infrastructure projects, although exports to the EU declined. Indonesia's sawn hardwood exports declined in 2013, with a 50% drop in shipments to China (ITTO MIS, 2014).

The availability of African sawn hardwoods was constrained in 2013 and the first half of 2014 by political unrest in the Central African Republic, shipping delays in Cameroon, and reduced production capacity following the global financial crisis. African sawn hardwood exporters have focused their marketing efforts on the Middle East and Asia, where demand remained steady during the European downturn (ITTO MIS, 2014).

6.6 POLICY AND REGULATORY INFLUENCES ON THE SECTOR

In 2013, legal cases were brought in the US under the Lacey Act and in the EU under the EU Timber Regulation against companies accused of trading in illegally harvested hardwood. These cases are putting pressure on hardwood enterprises to show evidence of legal sourcing. Governments in some hardwood-producing countries – e.g. the Russian Federation, Romania and tropical countries participating in the EU's Forest Law Enforcement, Governance and Trade Voluntary Partnership Agreement programme – are developing new forest codes and regulatory frameworks, which will also increase the level of scrutiny on harvesting operations and internal timber-supply chains.

Trade in American ash is subject to restrictions in North America and export markets with the aim of controlling the spread of the emerald ash borer (*Agrilus planipennis*). All ash sawn hardwood exported from designated quarantine areas in both the US and Canada must now be square-edged. US hardwood exporters have raised concerns that varying interpretations of "square-edged" in European export markets has impeded legitimate trade (AHEC, 2014).

Demand for biomass continued to rise in 2013 and into 2014, particularly in parts of Europe, driven partly by government support for renewable energy in general and for solid biomass (including wood) for energy in particular. Concerns have been raised in the European hardwood sawmilling sector about the potential impact of energy demand on the log supply (CWC, 2013). Environmental groups have also questioned the broader life-cycle implications of supplying biomass from different forest types (Royal Society for Protection of Birds et al., 2013).

Potential discrimination against hardwoods in public procurement policy is an issue for sections of the hardwood industry. In the US, products recognized by the US Department of Agriculture's (USDA's) BioPreferred® programme benefit from the Federal Procurement Preference. Hardwood products are ineligible for the BioPreferred® programme, while alternative products with only 25% bio-based content can be included. The US Hardwood Federation has given its support to the draft Forest Products Fairness Act of 2013, which would create a more equitable system (Hardwood Federation, 2014).

In the US, an industry consultation is underway on a proposed hardwood "Checkoff" programme. Checkoff programmes are collective marketing efforts funded by product producers and run by an industry-governed board coordinated through the USDA. Funding for the programme would come from sawmills and kiln-operating facilities with annual sales in excess of $2 million, which would pay a levy of $1 per $1,000 of sales (Hardwood Checkoff, 2014).

6.7 INNOVATION IN THE SECTOR

The world's first large facility for the manufacture of beech laminated veneer lumber (LVL) began operation in Germany in February 2014, a sign of growing interest in expanding the range of applications for hardwood in the structural sector. The €100 million facility has the capacity to produce 150,000-180,000 m^3 of beech LVL per year (Siempelkamp, 2014).

The American hardwood industry has also been demonstrating the potential of hardwood in structural applications. At the London Design Festival in September 2013, the American Hardwood Export Council showcased the Endless Stair, a towering structure of 15 Escher-like interlocking staircases. The Endless Stair pioneered the use of hardwood for cross-laminated timber, a product more typically made using softwood. The project used tulipwood, an abundant, relatively inexpensive American hardwood with strong structural characteristics. The Endless Stair also demonstrated the potential of new environmental life-cycle assessment and modelling tools to quantify sustainability in the building-design process (AHEC, 2014).

Source: AHEC 2014

There continues to be significant new investment, particularly in Europe, in facilities for the thermal treatment of timber, with a strong focus on hardwoods, to produce strong, durable products that can compete with tropical hardwoods in exterior applications. By the end of 2013, there were at least 93 thermal treatment kilns in Europe. The total capacity for thermally modified wood in Europe increased from 230,000 m^3 in 2012 to 280,000 m^3 in 2013 (Summers, 2013).

Note: The statistical annex of the *Forest Products Annual Market Review 2013-2014* is available at: www.unece.org/forests/fpamr2014-annex.html

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7 WOOD-BASED PANEL

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HIGHLIGHTS

- The consumption of wood-based panels in Europe increased by 2% in 2013, to about 1.3 million m^3. Although this growth was less than stellar, it occurred in a year that saw an overall drop in construction spending in the subregion.
- European consumption of fibreboard panels increased by 4.3% in 2013, with Turkey remaining the largest European consumer of these products, increasing consumption by 7%, to 4.4 million m^3.
- Italy, which was the leading European producer of non-coniferous plywood in 2010, was in fourth position in 2013, after being passed by Finland, Latvia and Poland.
- Demand for Russian wood-based panels has begun to improve, with total production increasing in the Russian Federation by 0.4% in 2013, to 12.7 million m^3.
- The Russian plywood industry recovered strongly in 2013, increasing production by 5% to 3.3 million m^3. This increase was supported by a combination of strong exports and increased domestic demand.
- Demand for structural wood-based panels (oriented strand board and softwood plywood) in North America grew by 5.5% in 2013, although this growth was slightly lower than in 2012.
- A coalition of US hardwood plywood manufacturers has appealed a decision by the US Department of Commerce to rescind duties that were earlier levied against Chinese hardwood and decorative plywood exporters.
- The US Environmental Protection Agency is in the final stages of modifying and adopting the California formaldehyde regulations for implementation at the national level. The Agency plans to publish its final rule at the end of 2014, with implementation likely a year later. The panels and wood working industry is concerned about the financial burden that this will put not on manufacturing panel.

7.1 INTRODUCTION

North America continues to improve economically and this has had a positive influence on its wood-based panels industry. In Europe, the debt crisis continued to depress the economy in 2013, but panel markets held up, despite a drop in almost all segments of the construction sector. There were signs of improvement in Europe, with construction forecast to increase (see Chapter 11 on housing). The production of wood-based panels grew slowly in the CIS, except for medium-density fibreboard (MDF), which dropped slightly. The Russian Federation is now producing oriented strand board (OSB), with three plants starting up in the past two years. These plants are operating far below capacity, but they are likely to use more capacity over time to satisfy strong demand for domestically produced panels.

Source: UNECE/FAO, 2014.

7.2 EUROPE

Building activity continued to decline in Europe in 2013, although to a lesser extent than in previous years. The situation differed within Europe, with some countries experiencing flat or slightly increasing housing activity. Surprisingly, both the production and consumption of wood-based panels increased.

MDF has tended to be singled out in discussions on fibreboard trends in Europe because it is the most important panel product in the subregion. Fibreboard panels – particularly MDF and high-density fibreboard – (HDF) can easily be misclassified. Therefore overall trends for fibreboard (both MDF and HDF) are given here, although MDF is mentioned specifically where market intelligence allows.

7.2.1 Consumption

The consumption of wood-based panels in Europe increased by 2% in 2013, an improvement of roughly 1.3 million m^3 over 2012 (table 7.2.1). Although the growth in consumption in 2013 was less than stellar, it occurred in a year that saw an overall drop in construction spending in the subregion.

Turkey was again a bright spot in the wood-based panels sector. It was the second-largest consumer in Europe (after Germany) in 2013 and recorded the largest increase in consumption (roughly 600,000 m^3, or 7%) compared with 2012. Other notable increases in the consumption of wood-based panels in Europe occurred in the UK (506,000 m^3) and Poland (461,000 m^3).

TABLE 7.2.1

Wood-based panel balance, Europe, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	67,258	68,161	71,351	1.3
Imports	28,612	29,774	29,810	4.1
Exports	31,211	31,953	32,170	2.4
Net trade	2,599	2,179	2,360	
Apparent consumption	64,659	65,982	68,990	2.0

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Sources: UNECE/FAO, 2014; UNECE, 2013.

Particle board

The apparent consumption of particle board in Europe increased by 1.3% in 2013, to 33.5 million m^3. There were large drops in Germany (-320,000 m^3), Slovakia (-221,000 m^3) and Italy (-177,000 m^3) but significant increases in Poland (+351,000 m^3), Turkey (+305,000 m^3) and the UK (+300,000 m^3).

Fibreboard

European consumption of fibreboard (hard, medium-density and low-density) increased in 2013 by 4.3%. Turkey remained the largest European consumer of fibreboard panels, with consumption increasing by 7% (283,000 m^3) in 2013, to 4.4 million m^3, followed by Germany, where consumption decreased by 4.1% (132,000 m^3) to about 3.1 million m^3. Poland was the third-largest consumer, increasing by 7.3% (144,000 m^3), to 2.1 million m^3. Significant increases in consumption are projected for Poland, Portugal and Romania for 2014, while significant decreases are forecast for Denmark and Ukraine. Turkey is a dynamic driver of fibreboard consumption, with consumption increases continuing to outpace the rest of the European subregion. Nevertheless, consumption in Europe excluding Turkey is still expected to rise by 3.4% in 2014 (EPF, 2014; UNECE/FAO, 2014).

OSB

European consumption of OSB increased in 2013 by 14.6%, and a growing share of production is being consumed in building applications (54% in 2013, compared with 50% in 2012). Nevertheless, it remains to be seen if the recovery in 2013 will be sustained in 2014 (EPF, 2014). The biggest consumer of OSB

in 2013 was Germany (1.2 million m³), followed by Romania (537,000 m³) and France (437,000 m³) (UNECE/FAO, 2014).

Plywood

Total plywood consumption in Europe decreased by 3% in 2013, to 7.22 million m³. Germany and the UK accounted for about one-third of all plywood consumed in Europe.

Non-coniferous plywood constitutes almost two-thirds of the plywood consumed in Europe by volume. The markets with the biggest consumption were the UK, at 867,000 m³ (up 0.8%); Germany, at 696,000 m³ (up 1.1%); France, at 382,000 m³ (up 6.6%); and Poland, at 319,000 m³ (up 12.9%).

The consumption of coniferous plywood in Europe was 2.9 million m³ in 2013, up by 2% from 2012. Of this total, Germany consumed 483,000 m³ (down 8.4%) and the UK 449,000 m³ (up 21.1%). These two countries were by far the largest consumers of coniferous plywood in Europe in 2013.

7.2.2 Production and capacity utilization

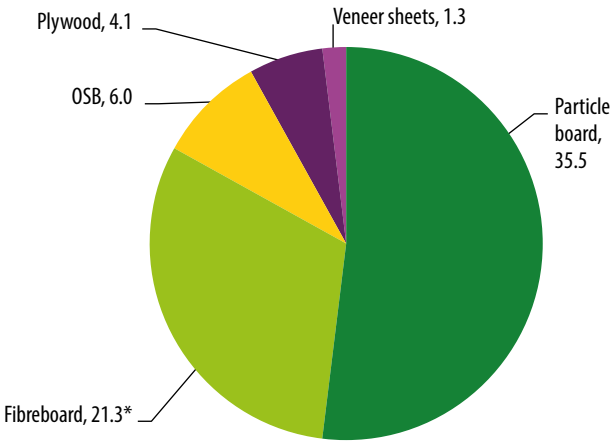
Particle board

The production of European particle board increased by 0.6% in 2013. Particle board dominates European panels, with production totalling 35.5 million m³ in 2013 (graph 7.2.1), which was well below the peak (44.6 million m³) recorded in 2007. In 2013, the largest declines in particle board production occurred in Italy (-234,000 m³), Norway (-94,000 m³) and Hungary (-93,000 m³). In contrast, significant production increases were reported in Portugal (+639,000 m³), Turkey (+350,000 m³) and Latvia (+135,000 m³). The Baltic States appear to be recovering from the economic crisis earlier than other parts of Europe. The European Panels Federation[14] (EPF) reported that the UK housing sector also displayed strong growth in 2013, supporting the recovery of the particle board industry there (EPF, 2014; UNECE/FAO, 2014).

Total European particle board production capacity declined by 1.8% in 2013, to just less than 39 million m³. The largest declines in production capacity were in Greece (-19%), France (5.8%) and Spain (-9.8%). Bulgaria and Romania, however, saw their production capacities increase slightly, with the capacity utilization rate reaching 74%. Overall European particle board production capacity is expected to increase by 0.4% in 2014, although total output will still be below 40 million m³ (EPF, 2014).

GRAPH 7.2.1

Wood-based panel production (million m³), Europe, 2013



Notes: Total wood-based panel production in Europe = 68.2 million m³.
* "Fibreboard" comprises MDF (68%), hardboard (17%) and insulating board (15%).
Source: UNECE/FAO, 2014.

Fibreboard

The total production of all fibreboard panels in the Europe subregion increased by 2.8% in 2013, to 21.3 million m³, up from 20.7 million m³ in 2012. Germany was Europe's largest producer in 2013, at about 5.1 million m³, followed by Turkey at 4.3 million m³ and Poland at 3.3 million m³.

Turkey's impressive growth in the production of fibreboard (globally, only China and Germany produce more) has a strong influence on the statistics of the Europe subregion.

The overall fibreboard capacity utilization rate among EPF members increased from 72% in 2012 to 74% in 2013, although MDF production capacity was unchanged. Fibreboard production capacity in Europe is expected to decline in 2014 because a plant in Austria closed in January 2014 (EPF, 2014).

OSB

European production of OSB rose by 9.9% in 2013, reaching almost 6 million m³. Romania (1.3 million m³) and Germany (1.3 million m³) are the largest European OSB producers. A new OSB plant opened in Italy in 2013, with a capacity of 130,000 m³.

Plywood

European plywood production was 4.1 million m³ in 2013, a drop of 7.2% from the 4.4 million m³ produced in 2012. Production is split almost evenly between coniferous and non-coniferous plywood.

Europe's non-coniferous plywood production was 2.1 million m³ in 2013, a decrease of 13.9% compared with 2012. The top five producing countries account for 63% of non-coniferous plywood production: Finland 330,000 m³ (up 10% from 2012), Latvia 285,000 m³ (up 2.7%), Poland 275,000 m³ (up 0.8%), Italy 223,000 m³ (down 18.4%) and Spain 194,000 m³ (no change). Italy was the top producer of non-coniferous plywood in 2010.

Europe produced 2 million m³ of coniferous plywood in 2013, an increase of 0.9% compared with 2012; overall, production of

[14] The European Panels Federation (EPF) reports information on 27 European countries. These are Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and United Kingdom.

this product increased in Europe by 27.4% between 2009 and 2013. Finland accounted for 37.4% of total European production in 2013, at 760,000 m³ (up 5.6%). Austria (185,000 m³), France (149,000 m³), Portugal (139,000 m³) and the Czech Republic (127,000 m³) were the next-largest producers in 2013.

7.2.3 Trade

7.2.3.1 Imports

Particle board

Imports of particle board increased by 3.1% in Europe in 2013, a substantial improvement compared with the 3.5% decline recorded in 2012. There were sharp differences among countries, however, with Austria, Germany and Sweden importing substantially less particle board in 2013 than they did in 2012. Imports from extra-EU countries came mainly from neighbouring countries such as Norway, the Russian Federation, Switzerland and Turkey (EPF, 2014; UNECE/FAO, 2014).

Fibreboard

Fibreboard imports into the EU originated mainly in Norway, Switzerland and Turkey. EU imports of fibreboard from China were also substantial in 2013.

OSB

EU imports of OSB in 2013 came mainly from Switzerland, the US, Canada, China, Ukraine and Turkey (in decreasing order of volume) (EPF, 2014).

Plywood

The Europe subregion imported 6.9 million m³ in 2013, up by 2.7% from 2012. The biggest plywood-importing countries were the UK (1.4 million m³), Germany (1.3 million m³) and Belgium (537,000 m³).

7.2.3.2 Exports

Particle board

The largest particle board-exporting countries in 2013, by volume, were: Austria (1.8 million m³), France (1.7 million m³) and Germany (1.7 million m³). Declines in exports from Greece and Norway can be attributed to reduced production capacity, but a sharp decline in UK exports was the result of strong growth in domestic consumption. In total, Europe's particle board exports remained almost unchanged (-0.7%) in 2013, at 12.0 million m³. Exports to countries outside Europe rose by 1% in 2013; these were increasingly directed to East Asian and Middle Eastern countries. Exports to African destinations, especially countries on the Mediterranean, declined significantly in 2013. Total particle board exports from Europe are projected to increase steadily in 2014 (EPF, 2014; UNECE/FAO, 2014).

Fibreboard

Exports of all fibreboard panels from Europe rose by 2.6% in 2013. The largest exporters were Germany (3.1 million m³), Poland (1.5 million m³) and Spain (1 million m³) (UNECE/FAO, 2014). Overall, exports of MDF to countries outside the EU fell by 23% in 2013; exports decreased by 36% to Middle Eastern countries and by 15% to African countries. MDF export volumes are expected to remain unchanged in 2014 (EPF, 2014).

OSB

Most OSB produced in Europe is traded within the region. The largest OSB exporters are Romania (778,000 m³), Germany (540,000 m³), the Czech Republic (529,000 m³) and Latvia (451,000 m³). Exports by EPF member countries decreased by 16% to the Far East but increased by 17% to the Middle East. Exports to the US also increased, reflecting the recovery of the US housing market (EPF, 2014). Europe's OSB exports are expected to remain unchanged in 2014 (UNECE/FAO, 2014).

Plywood

Total plywood exports from the European subregion increased by 4.5% in 2013 (to 3.9 million m³). The largest plywood-exporting country in the subregion was Finland (920,000 m³), followed by Belgium (369,000 m³) and Austria (353,000 m³); export volumes increased in all three countries in 2013.

7.3 CIS SUBREGION, WITH A FOCUS ON THE RUSSIAN FEDERATION

7.3.1 Consumption

The consumption of wood-based panels in the CIS increased by 3.9% in 2013, to 18.6 million m³ (table 7.3.1). Plywood and particle board consumption increased by 1%, fibreboard consumption increased by 6%, and OSB consumption increased by more than 20%.

TABLE 7.3.1

Wood-based panel balance, CIS, 2012-2014

	(1,000 m³)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	16,086	16,570	17,409	3.0
Imports	5,705	6,327	6,327	10.9
Exports	3,939	4,345	4,490	10.3
Net trade	-1,766	-1,983	-1,838	
Apparent consumption	17,852	18,553	19,247	3.9

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Sources: UNECE/FAO, 2014; UNECE, 2013.

7.3.2 Production and capacity utilization change

The production of wood-based panels in the CIS increased by 3% in 2013, to 16.6 million m³. Production trends in the Russian Federation differed somewhat among the three major panel categories, with plywood production growing but particle board and fibreboard contracting slightly (graph 7.3.1). Overall, there was a 1.3% increase in the production of wood-based panels in the Russian Federation in 2013, to 12.9 million m³ (which was 78% of total production in the CIS).

Plywood

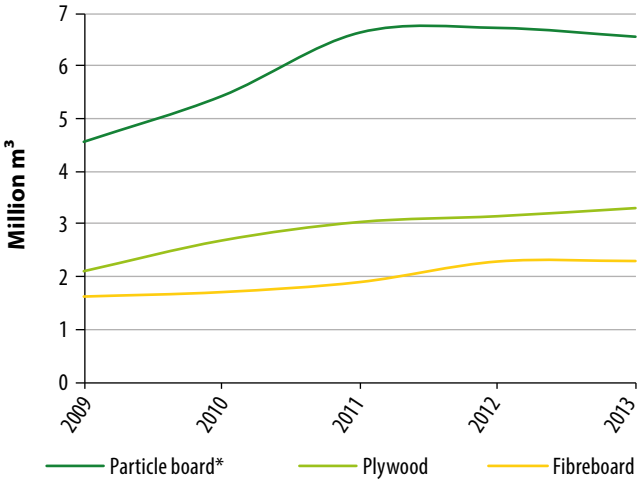
The Russian plywood industry, which accounts for 90% of CIS production, posted strong gains in 2013, with production volume increasing by 5% to 3.3 million m³ (graph 7.3.1). The increased plywood production was supported by strong demand, both domestically and in export markets. Plywood production grew for four consecutive years, with volume increasing by 56.8% from 2009 to 2013 (Rosstat, 2014). Overall production in the CIS increased by 165,000 m³ (4.7%) in 2013, to 3.7 million m³.

Particle board

Particle board production increased slightly (by 0.7%) in the CIS in 2013, to 9.3 million m³, but Russian production decreased by 2.5%, to 6.6 million m³ (graph 7.3.1).

GRAPH 7.3.1

Russian plywood, particle board and fibreboard production, 2009-2013



Note: * Excludes OSB.
Source: UNECE/FAO, 2014.

OSB

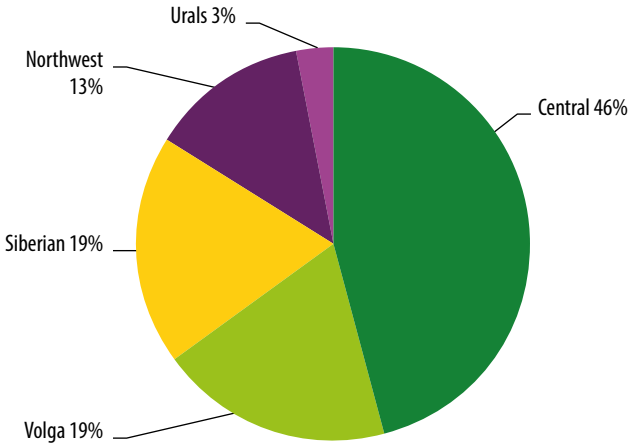
The Russian Federation is the sole producer of OSB in the CIS. OSB is used mainly in residential construction (e.g. the production of subfloors, walls and I-beams), and small volumes are also used in the production of furniture and pallets. Three Russian OSB mills were in operation in 2013: DOK Kalevala (Petrozavodsk, Karelia), which launched the first large-scale production of OSB; Hillman OSB (in the Vladimir oblast); and Novovyatsky ski mill (in the Kirov oblast). These three mills combined produced 101,100 m³ of OSB in 2013, the total CIS production. Apparent OSB consumption in the Russian Federation in 2013 (including imports of 694,500 m³) amounted to 756,000 m³, up by 24% from 2012. DOK Kalevala may start production at its second line in 2014 if market conditions become favourable, in which case the company's production could grow to 500,000 m³/year.

Fibreboard

Fibreboard production in the CIS increased modestly (by 3.2%) in 2013, to 3.7 million m³. The contribution of the Russian Federation to this total was the same as in 2012, at 2.3 million m³ (graph 7.3.1). In the Russian Federation, the Central (Kronospan and Kronostar), Siberian (Lesosibirskiy LDK and Novoyeniseisk LHK) and Volga Federal Districts produce 84% of the country's total fibreboard volume (graph 7.3.2).

GRAPH 7.3.2

Production shares of fibreboard by region, Russian Federation, 2013



Source: Rosstat, 2014.

The highest levels of capacity utilization are in the plywood and particle board industries. The developing OSB industry has a low capacity utilization rate of about 22% (table 7.3.2).

TABLE 7.3.2

Wood-based panel production, Russian Federation, 2013

	(1,000 m³)	
	Production capacity	*Capacity utilization rate (%)*
Particle board	7,100	95.5
Plywood	3,700	89.2
Fibreboard	2,750	70.0
OSB	460	21.9

Source: WhatWood, 2014.

Many enterprises in the Russian panel subsector are in flux. In the autumn of 2013, for example, Krasnyi Yakor CJSC (Slobodskoy, Kirov oblast) acquired the Parfinsky plywood mill (Parfino, Novgorod oblast). The largest Russian plywood mill of its kind, Yenisei plywood mill (in Sosnovoborsk, Krasnoyarsk oblast), with an annual capacity of 450,000 m³, remains unprofitable. Raw-material shortages, and a lack of sales of finished products, are the main causes of this lack of profitability; in 2013, a number of organizations asked a court to declare the enterprise bankrupt. At the end of 2013 it was announced that Arkhangelsk PPM would close its fibreboard production line from 1 April 2014. At the same time, however, Yugra-Plit (in Sovetsk, Khanty-Mansiysk autonomous district) launched a new particle board production line with an annual capacity of 265,000 m³.

7.3.3 Prices

The wood-based panel industry accounted for 46% (123 billion roubles) of the revenue[15] generated by the forest products industry in the Russian Federation. Twenty-four per cent of total woodworking sales (65.1 billion roubles) were from plywood, 15% (40.9 billion roubles) were from particle board, and 7% (17.7 billion roubles) were from fibreboard (WhatWood, 2014).

Plywood

Producer prices (average for all regions) for plywood grew by 4.1% in the Russian Federation in 2013 (graph 7.3.3), to 16,509 roubles/m^3, with the highest price being 20,176 roubles/m^3, up 8% from 2012 – recorded in the North-West federal district. The lowest price being 11,211 roubles/m^3, down 0.3% from 2012 – was recorded in the Siberian federal district. Domestic market demand for plywood is expected to be steady in 2014.

Particle board

The average price of particle board in the Russian Federation grew by 7.3% in 2013, to 9,155 roubles/m^3. The most dynamic growth was in the Siberian federal district, where it grew by 37.3%, to 9,814 roubles/m^3. Particle board prices grew by 21.8% in the North-West federal district, to 8,844 roubles/m^3; by 3.4% in the Volga federal district, to 8,734 roubles/m^3; and by 5.9% in the Central federal district, to 7,642 roubles/m^3.

Fibreboard

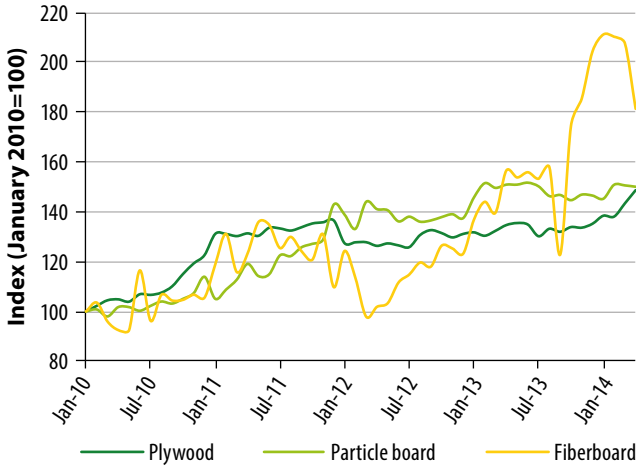
Average prices of fibreboard in the Russian Federation grew by 37.6% in 2013, to 58 roubles/m^2. The price fell in the Urals (from 35 to 29 roubles/m^2) but increased in the Central region (from 51 to 59 roubles/m^2), North-West (from 58 to 64 roubles/m^2) and Siberian (from 33 to 66 roubles/m^2) federal districts. The reason for the price increase beginning in October 2013 was a shortage of raw materials and the subsequent increase in their price. Raw-material prices started to decline at the beginning of 2014.

Source: UNECE/FAO, 2014.

[15] Net sales from goods, products, works and services, excluding value-added tax, excises or other similar compulsory payments.

GRAPH 7.3.3

Monthly price index for wood-based panels, Russian Federation, 2010-2014



Source: Rosstat, 2014.

7.3.4 Trade

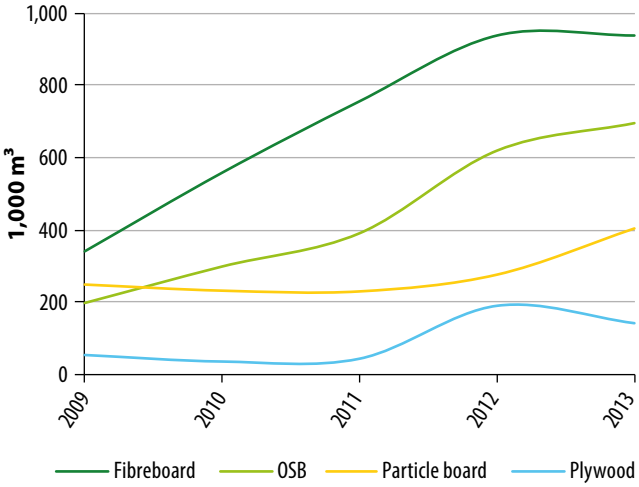
7.3.4.1 Imports

Plywood

Imported plywood generally does not play a major role in the Russian plywood market: for much of the past decade, the average annual import volume of plywood was 40,000-50,000 m^3, 70-80% of which was imported from China. In 2012, however, imports of Chinese plywood increased by 36%, to 172,263 m^3. The total import volume declined somewhat in 2013, to 141,000 m^3 (graph 7.3.4). The growth in plywood imports from China can be attributed to demand in eastern Siberia.

GRAPH 7.3.4

Russian fibreboard, OSB, particle board and plywood imports, 2009-2013



Source: UNECE/FAO, 2014.

OSB

Despite the newness of the OSB manufacturing sector in the Russian Federation, the volume of OSB imports there rose by 23% in 2013, to 694,800 m^3 (and to just over 1 million m^3 in the CIS). OSB imports were dominated by the Kronospan Group, supplied by Romanian and Latvian plants. Other major suppliers were Canada and Germany.

Particle board

Imports of particle board into the CIS increased by just over 9% in 2013, to 2.3 million m^3. Particle board imports by the Russian Federation increased by 46.5%, to 403,000 m^3. About 35% of Russian particle board imports came from Poland, 20% came from China and 20% came from Ukraine.

Fibreboard

Fibreboard imports into the CIS increased by 12.4% in 2013, to 2.3 million m^3. Imports of fibreboard to the Russian Federation were steady, however, at 937,000 m^3. China continues to be the largest supplier of fibreboard to the Russian Federation.

7.3.4.2 Exports

Plywood

CIS plywood exports were up by 11% in 2013, to just over 2 million m^3. The Russian plywood industry is export-oriented, with 50-55% of its production exported. Traditionally, the main importers of Russian plywood are the CIS countries, as well as Egypt, Germany, Latvia and the US. The Russian Federation exported 1.7 million m^3 of plywood in 2013, up by 8.5% from 2012, and the export share of plywood sales was 52%. The US remained the main importer of Russian plywood, importing 230,200 m^3 in 2013, an increase of 3.8% over 2012. US demand for Russian plywood was reinforced by the continued recovery of its residential construction sector. The Egyptian market declined by 4.6% in 2013, to 207,900 m^3.

Particle board

Exports of particle board from the CIS increased by 13.4% in 2013, to more than 1.1 million m^3. The volume of Russian particle board exports fell by 9.5%, to 363,200 m^3, but their value grew by 2.3%, to $92.8 million. Exports to Uzbekistan accounted for $66.3 million of this total, an increase of 49.6% over 2012.

Fibreboard

Fibreboard exports from the CIS increased by 15% in 2013, to 725,000 m^3. Total exports of Russian fibreboard reached 329,000 m^3, with a value of $138 million. CIS countries continued to be the main consumers of Russian fibreboard. The largest importer of fibreboard from the Russian Federation in 2013 was Uzbekistan, with 153,458 m^3, a 1.6% increase over 2012.

OSB

Exports of OSB from the Russian Federation amounted to about 40,000 m^3 in 2013. Russian OSB manufacturers will consider the potential for exports to Central Asia based on price considerations, their ability to increase their existing capacity utilization and domestic demand.

7.4 NORTH AMERICA

7.4.1 Consumption

Growth in the demand for housing, as well as for interior products such as cabinets and furniture, helped push up the consumption of all wood-based panels in North America by 5.4% (table 7.4.1).

TABLE 7.4.1

Wood-based panel balance, North America, 2012-2014

	(1,000 m^3)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	42,569	45,086	45,362	5.9
Imports	12,087	12,958	13,348	7.2
Exports	7,855	8,714	8,946	10.9
Net trade	-4,231	-4,245	-4,402	
Apparent consumption	46,800	49,331	49,764	5.4

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

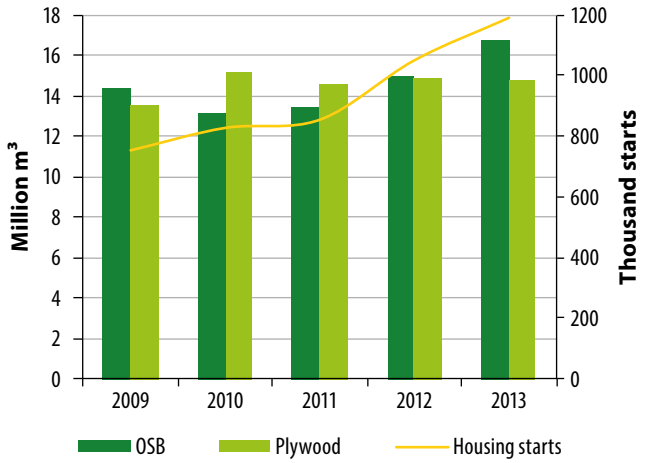
The apparent consumption of structural wood-based panels (OSB and softwood plywood) in North America continued to recover in 2013, growing overall by 5.5% (graph 7.4.1). Apparent consumption of OSB was up by 11.7%, offset somewhat by a slight decline (0.6%) in plywood consumption. The consumption of structural panels recovered across three of the four major end-use markets (residential construction, up 17%; remodelling, up 3%; and industrial, up 2%), but fell by 9% in the non-residential market (graph 7.4.2).

Source: UNECE/FAO, 2014.

Growth in demand for both plywood and OSB was strongest in the residential housing sector (up by 16.9% and 17.6%, respectively), but demand in the other market segments remained weak. North American demand is expected to increase in 2014 – by 7.9% for OSB and by 3.4% for plywood. The vast majority of this growth in demand is projected to occur in the US, with demand in Canada to remain largely unchanged in 2014 (APA, 2014a, 2014b).

GRAPH 7.4.1

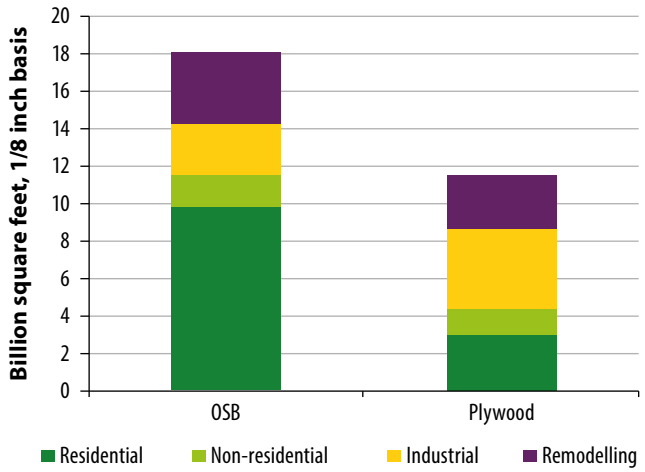
Structural panel consumption and housing starts, North America, 2009-2013



Note: Housing starts are at the seasonally annualized adjusted rate.
Sources: UNECE/FAO, 2014; US Census Bureau, 2014; CHMC, 2014.

GRAPH 7.4.2

Four main end-use markets for structural panels, North America, 2013



Note: Residential, non-residential and industrial are new construction.
Source: APA, 2014a.

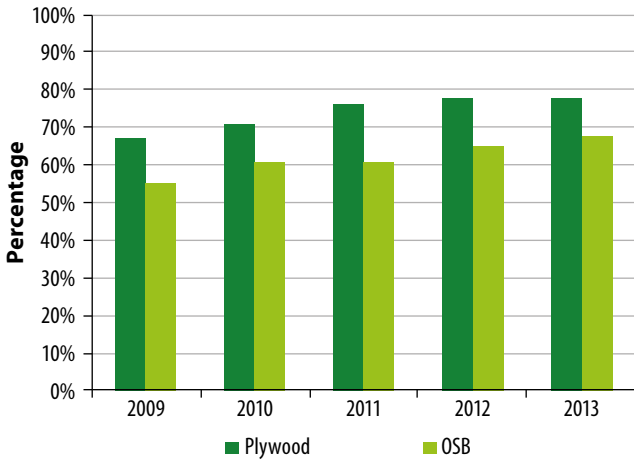
Overall production of non-structural panels (particle board and fibreboard) in North America grew across all product segments in 2013. The production of particle board was up by 8.5% (to 5.8 million m^3), while the production of MDF and hardboard was up by 2.7% (to 4.2 million m^3). With North American housing starts projected to increase in 2014, the production of non-structural wood-based panels is expected to show more moderate growth. Particle board production is projected to increase by 0.9% and MDF production by 1%.

7.4.2 Production and capacity utilization

Production capacity in the North American structural panel subsector increased by 4.7% in 2013, to 37 million m^3. Two OSB mills opened in the 2012-2013 period and no mills closed: a large OSB mill opened in eastern Canada at the end of 2012, while another OSB mill opened in southeastern US in the first quarter of 2013 (APA, 2014b). The capacity utilization rate in the North American structural panel industry remained relatively low, at 72%, in 2013, although this was substantially better than the 59% rate recorded in 2009 at the height of the financial and housing crises. The capacity utilization rate for plywood was constant in 2013 at 78%, while for OSB it increased from 63.5% to 68% (graph 7.4.3). Capacity utilization rates in 2013 were 77% in the US and 83% in Canada for plywood, and 72% in the US and 61% in Canada for OSB.

GRAPH 7.4.3

Plywood and OSB capacity utilization rates, North America, 2009-2013



Source: APA, 2014a.

The situation in the non-structural panel industry improved slightly in 2013 compared with 2012 (CPA, 2014). Production capacity in the particle board sector was down by 2.5%, from 10.1 million m^3 to 9.9 million m^3. Production capacity in the MDF sector declined by 1.2%, to 4.82 million m^3, while production capacity in the hardboard subsector decreased by 6.2%, to 1.08 million m^3. Capacity utilization rates increased across all subsectors of the non-structural panel industry, although they remained well below pre-housing crisis levels. The capacity utilization rate increased from 58.7% in 2012 to 65.3% in 2013 in the particle board subsector and from 76.4% to 79.2% in the MDF subsector, and it was steady at 69.6% in the hardboard subsector (CPA, 2013).

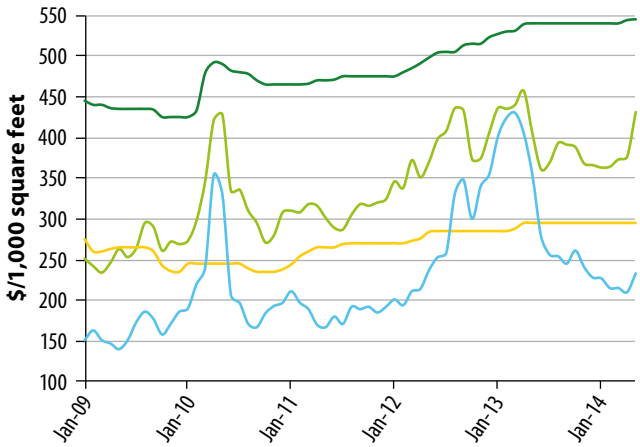
7.4.3 Prices

Increased demand for structural wood-based panels in North America in 2013 was offset by an even larger increase in production, with the result that prices for structural panels, particularly OSB, fell substantially in 2013. On the other hand, increased demand for furniture and cabinets helped maintain non-structural panel prices, despite an increase in production

volume (graph 7.4.4). Prices for plywood in western North America were down by 16.1% in 2013, dropping to $366 per thousand square feet. OSB prices fell even more dramatically in 2013, by 43.1%, to close the year at $228 per thousand square feet. In contrast, particle board and MDF prices were stable at $295 per thousand square feet and $540 per thousand square feet, respectively, in 2013 (Random Lengths, 2014a).

GRAPH 7.4.4

North American wood-based panel prices, 2009-2014



Notes: Western plywood (Coast), 1/2 inch, CD exterior, (3 ply); OSB (North Central), 7/16 inch; MDF (East) 5/8 inch; particle board (West) 5/8 inch industrial.
Source: Random Lengths, 2014a.

7.4.4 Trade

7.4.4.1 Imports

Imports of wood-based panels into North America increased by 14% in 2013, from $4.6 billion in 2012 to almost $5.3 billion (table 7.4.2). Imports to Canada and the US were mixed, with the value of US imports increasing by 17.5% and the value of Canadian imports falling by 0.6%. The US accounted for 82.9% of North American imports in 2013 (up from 80.5% in 2012) and registered sharp increases in imports for all panel products. Plywood had the largest share of North American imports (45.9% of total wood-based panel imports), followed by fibreboard (26.7%), OSB (21.6%) and particle board (5.8%). North American imports were up by 6.4% for plywood, by 10.2% for fibreboard and by 34.6% for particle board. In the US, both particle board (+36.8%) and fibreboard (+16.6%) imports registered double-digit increases between 2012 and 2013, by value, while plywood import value increased by only 8% (table 7.4.2). The lower increase in plywood imports might be due to the preliminary import tariffs imposed on Chinese plywood imports into the US, which were in force for much of 2013.

TABLE 7.4.2

Value of North American wood-based panel imports, 2010-2013

	($ million)				
	2010	*2011*	*2012*	*2013*	*Change (%) 2012-2013*
US					
Plywood	1,390	1,357	1,906	2,058	8.0
Fibreboard	705	719	833	971	16.6
OSB	610	529	772	1,102	42.8
Particle board	188	181	218	251	15.5
US total	2,893	2,787	3,729	4,382	17.5
Canada					
Plywood	294	313	373	366	-1.8
Fibreboard	451	413	447	440	-1.6
OSB	32	30	34	39	15.6
Particle board	45	47	53	57	7.0
Canada total	822	803	906	901	-0.6
North America					
Plywood	1,684	1,671	2,279	2,423	6.4
Fibreboard	1,156	1,131	1,280	1,411	10.2
OSB	642	559	805	1 141	41.6
Particle board	233	228	271	308	13.9
Total	3,715	3,590	4,635	5,283	14.0

Source: UNECE/FAO, 2014.

7.4.4.2 Exports

The value of North American exports of wood-based panels increased by 18.9% in 2013, to $2.8 billion (up from $2.4 billion in 2012), with Canada accounting for 68.8% of the total (table 7.4.3). Almost half of panel exports, by value, were OSB (47.4%), with fibreboard (17.7%), plywood (23.2%) and particle board (11.7%) making up the remainder. North American OSB export value was up by 38.7% and plywood export value was up by 9.1%. In contrast, fibreboard export value dropped by 2.6%. The US accounted for the majority of plywood (67% by value) and fibreboard (53%) exports in 2013, while Canada accounted for 93% of OSB exports and 70% of particle board. The largest markets for US plywood exports were Canada (43.7% by value) and China (18.1%). Canada (66%) and Mexico (22.8%) were the main markets for US fibreboard exports and also for particle board exports (53.1% to Canada and 27.9% to Mexico). Canadian wood-based panel exports went almost exclusively across the border to the US – 89.6% of plywood, 96.2% of fibreboard and 91.9% of particle board (table 7.4.3).

TABLE 7.4.3

Value of North American wood-based panel exports, 2010-2013

	($ million)				
	2010	2011	2012	2013	Change (%) 2012-2013
US					
Plywood	191	203	434	438	0.9
Fibreboard	263	268	280	264	-5.7
OSB	72	80	76	90	18.5
Particle board	81	83	94	99	5.4
US total	607	634	884	891	0.8
Canada					
Plywood	180	169	164	214	30.6
Fibreboard	234	227	232	235	1.2
OSB	705	644	884	1,242	40.5
Particle board	168	161	201	230	14.6
Canada total	1,287	1,200	1,481	1,921	29.7
North America					
Plywood	371	373	598	652	9.1
Fibreboard	498	494	512	499	-2.6
OSB	777	724	960	1,332	38.7
Particle board	250	244	295	330	11.7
Total	1,895	1,834	2,365	2,812	18.9

Source: UNECE/FAO, 2014.

7.5 EXTRA-REGIONAL INFLUENCE ON THE UNECE REGION

Plywood production, consumption and trade in the Asia-Pacific region influences the availability and prices of tropical plywood in European and North American markets. China continues to dominate the global production of softwood and hardwood plywood (at around 44.5 million m^3/year); it is the largest exporter of plywood, mostly produced from non-tropical raw material. China's domestic consumption of plywood is large (about 83% of production) and follows trends in China's construction industry. Nevertheless, about 30% of China's production is estimated to be exported indirectly after it has been manufactured into furniture and other secondary processed wood products (Xiaoyu, 2011). In 2013, the plywood exports of China and other Asian suppliers were affected by fluctuating freight rates, which contributed to volatility in CIF (cost, insurance and freight) prices for Asian plywood in EU markets. Some Chinese mills were reportedly compromising on the quality of veneers and glues to maintain price stability (ITTO MIS, 2013a). China's 2013 plywood exports were also affected by concerns about the verification of legality. Larger manufacturers were reportedly making efforts to replace tropical hardwood veneer species perceived to be at "high risk" of illegal logging with species deemed to be "low risk", such as poplar and certified meranti and sapele.

Malaysia and Indonesia continued to provide the bulk of global tropical plywood exports in 2013, with both countries reporting increases in export volumes (0.3% and 7%, respectively) (table 7.5.1). Malaysia's exports to the EU were affected by removal of its GSP (Generalised System of Preferences) tariff status, while EU import duties on Malaysian plywood increased from 3.5% to 7.0% from 1 January 2014. However, Malaysian and Indonesian exporters to EU markets are expected to benefit in 2014 from rising prices and the restricted availability of Russian birch plywood, which has been a significant competitor in recent years.

TABLE 7.5.1

Major importers and exporters of plywood outside the UNECE region, 2011-2013

	($1000\ m^3$)			
	2011	2012	2013	Change (%) 2012-2013
Major importers				
Japan	3,810	3,647	3,767	3.3
Republic of Korea	1,138	1,214	1,289	6.2
Saudi Arabia	590	752	697	-7.3
Taiwan PoC	689	649	694	6.9
Mexico	528	506	n/a	n/a
Major exporters				
China	9,598	10,035	10,265	2.3
Malaysia	3,236	3,388	3,397	0.3
Indonesia	2,912	3,003	3,207	6.8
Brazil	794	876	948	8.2
Uruguay	125	160	177	10.6

Note: A conversion factor of 1.54 m^3/1,000 kg was assumed for figures recorded in kg.

Sources: Global Trade Information Service, 2014; COMTRADE, 2014.

Although Brazil's total plywood exports grew in both 2012 and 2013, tropical plywood exports declined. Brazil's tropical plywood industry had difficulty obtaining plywood-quality logs from verified legal sources and was also affected by greater control of logging and by intense competition from Chinese plywood in UNECE markets. Domestic consumption has also risen, and tropical plywood production is now being sold mainly into the Brazilian domestic market (ITTO MIS, 2013b). In contrast to Indonesia and Malaysia, Brazil's tropical plywood exports have been mainly to UNECE markets. African tropical plywood production and trade continue to be constrained by reductions in log availability and a significant reduction in plywood production capacity, which has not fully recovered from the effects of the economic crisis.

7.6 POLICY AND REGULATORY INFLUENCES ON THE SECTOR

Decision No. 529/2013/EU of the European Parliament and of the Council of 21 May 2013 on accounting rules on greenhouse gas emissions and removals resulting from activities relating to land use, land-use change and forestry and on information concerning actions relating to those activities came into effect on 8 July 2013. This decision recognizes that the "increased sustainable use of harvested wood products can substantially limit carbon emissions into, and enhance removals of greenhouse gases from, the atmosphere". Through the decision, the EU Commission invites "Member States to provide incentives for the use of harvested wood products with long life cycles". The decision has the potential to greatly increase the use of sustainably managed and harvested wood products, including those used for residential housing, commercial construction and energy generation.

In April 2013, the US Department of Commerce (US DOC) imposed preliminary anti-dumping duties of 64% on Chinese hardwood plywood imported into the US (Random Lengths, 2013b). Even though earlier rulings found that the Chinese industry was being subsidized and was dumping product, the US DOC ruled in October 2013 that the US plywood industry was not "materially injured or threatened with material injury" and rescinded all punitive rulings (Random Lengths, 2013d). This ruling has been appealed by a coalition of US hardwood plywood manufacturers. A final decision by the US Court of International Trade is expected by late 2014 or early 2015 (Random Lengths, 2013a, 2013b, 2014b; 2014c).

The California formaldehyde emission regulation, which came into effect in 2009 and phased in increased restrictions in 2012, limits the allowable amount of formaldehyde emissions from wood-based panels. The US Environmental Protection Agency (US EPA) is in the final stages of modifying and adopting the California formaldehyde emissions regulations for implementation at the national level. The US EPA plans to publish its final rule at the end of 2014, with implementation likely to start a year later. The panels and wood-working industry is concerned about the financial burden that this will put on manufacturing and working with panels. In the meantime, California is working to update and amend its own rule to be consistent with the US EPA rule when implemented (Random Lengths, 2013e).

Note: The statistical annex of the *Forest Products Annual Market Review 2013-2014* is available at: www.unece.org/forests/fpamr2014-annex.html

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8 PAPER, PAPERBOARD AND WOODPULP

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HIGHLIGHTS

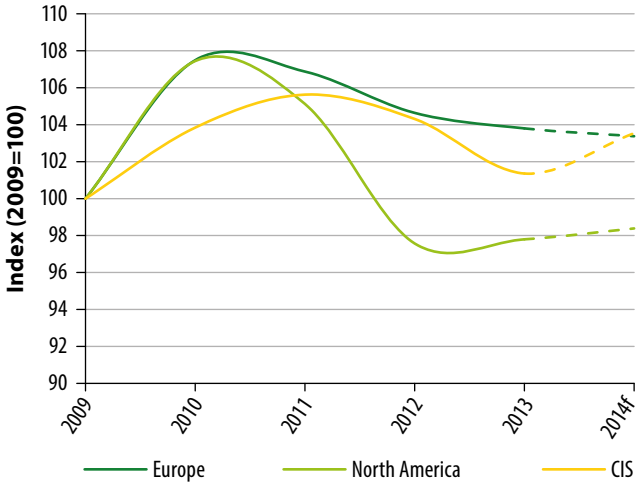
- Paper and paperboard production rose in North America (despite capacity closures in the graphic grades) but decreased in Europe and the CIS. Graphic paper and chemical wood pulp output fell in all three UNECE subregions, the result of closures brought on by reduced consumption due to increased use of electronic communications.
- A wave of closures and cost-reduction efforts continued in the paper sector in Europe and North America, with further consolidation likely in 2014 and beyond in the graphic paper subsector.
- Paper prices declined in 2013 but largely stabilized in early 2014; there is continued downward pressure on graphic paper, but packaging paper and paperboard prices are rising due to stronger demand.
- Newsprint consumption in North America fell by 6.56 million tonnes between January 2004 and December 2013. North American newsprint capacity was 6.7 million tonnes in 2014, having fallen by more than half from the 15 million tonnes recorded in 2000.
- In Europe and the US, a trend of conversion from graphic paper production to paperboard continued in 2013 and into 2014, due to stronger demand in that subsector.
- Chinese import duties on dissolving pulp reduced imports from Canada, Brazil and the US and halted a few expansion projects in those countries. Following from this, prices were again weak in early 2014 as reduced exports to China and capacity growth elsewhere resulted in supply continuing to exceed demand.
- CIS production of paper and paperboard fell by 2.8% in 2013. Geopolitical developments in the Ukraine have the potential to have a negative impact on subregional trade.
- Tighter credit markets and low domestic consumption continued to reduce demand for European and North American pulp and recovered paper in 2013 and early 2014.
- Prices for pulp and recovered paper, which moved upward through most of 2013 and into 2014, have shown signs of decline, mainly due to new and expanded capacity and stagnant global demand.
- South American chemical market pulp expansions continued in 2013, but lower projected growth in demand has led to project delays and the closure of high-cost capacity..

8.1 INTRODUCTION

Global pulp, paper and paperboard producers faced ongoing challenges in 2013 in matching efficient and cost-effective supply with an ever-changing demand landscape. Bold capacity rationalization and cost-reduction strategies, including strategic alliances and mergers, continued to be implemented or studied across all pulp, paper and paperboard grades in Europe, Japan and North America. Despite these efforts, capacity remains in excess of demand, which is declining across publishing paper grades as a result of the increased use of electronic communication, including via the Internet. Several companies in the subsector continued to convert from graphic grades to packaging papers in 2013. In the UNECE region, North America managed a meager increase in the production of paper and paperboard in 2013 over 2012, with Europe and the CIS both showing lower production during the same period (graph 8.1.1).

GRAPH 8.1.1

Production of paper and paperboard, UNECE region, 2009-2014



Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

8.1.1 Overall trends

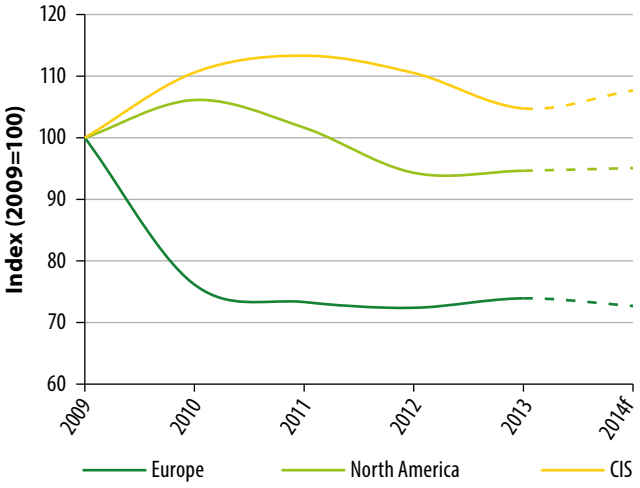
For companies to thrive in today's highly competitive market they must implement cost-saving measures, focus production and marketing on niche markets, and find strategic partners via mergers and acquisitions. The pulp, paper and paperboard industry spans the globe, and keeping abreast of the latest production technologies and consumption trends is the key to success. Newer and larger pulp mills will displace smaller ones, and excess capacity in commodity graphic grades will continue to lead to further closures and industry consolidation.

An economic improvement appeared to take hold in much of Europe in late 2013 and continued into 2014, following a recession that began in mid-2012. In China, GDP growth was 7.7% in 2013 and is expected to scale down a notch to 7.5% in 2014, due mainly to slowing exports, tighter credit markets and sluggish domestic consumption. China's central government has initiated economic and social reforms aimed at providing a "soft landing" and leading China along a new path of sustainable but more moderate growth, with less reliance on public investment and an increased focus on private consumption.

The proliferation of electronic formats using the internet, smartphone and tablet technologies continued to gain momentum in 2013 through mid-2014. This has prompted businesses and governments to push for further cost reductions in data manipulation and communication, including traditional mail services, by embracing technology and investing in processes that may provide improved and timelier service to customers. As a result, graphic paper demand continued to decline in the CIS, North America and Europe, with 4.6 million tonnes of capacity permanently removed from production (Valois Vision Marketing, 2014a). The bright spot for the industry was a continued improvement in paperboard demand, reflecting the continued growth of online shopping and increasing global trade, coupled with industry consolidation, capacity rationalization and the implementation of major cost-reduction strategies. Graph 8.1.2 shows subregional trends in paper and paperboard consumption in 2009-2014.

GRAPH 8.1.2

Apparent consumption of paper and paperboard, UNECE region, 2009-2014



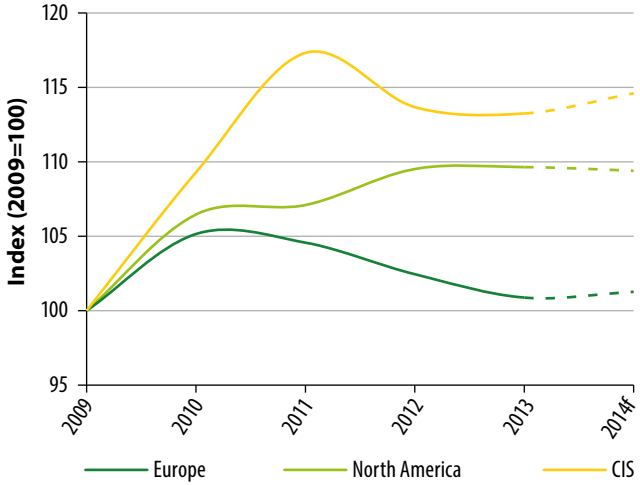
Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

8.1.2 Pulp

Pulp capacity expansions continued in 2013 and early 2014 with the start-up of 4.5 million tonnes of bleached eucalyptus kraft in South America, but there were no such expansions in North America or Europe (graph 8.1.3). On the contrary, pulp mill closures and conversions removed 2.0 million tonnes of capacity, and another 4 million tonnes of integrated pulp capacity were permanently or indefinitely removed (Valois Vision Marketing, 2014b).

GRAPH 8.1.3

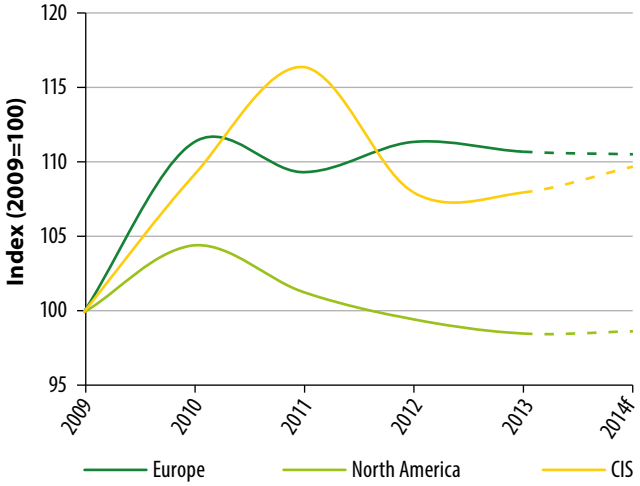
Production of wood pulp, UNECE region, 2009-2014



Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

GRAPH 8.1.4

Apparent consumption of wood pulp, UNECE region, 2009-2014



Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

Significant capacity expansion in the bleached hardwood kraft pulp segment – mainly bleached eucalyptus kraft in Brazil – and robust demand for bleached softwood kraft prompted swing capacity mills (mills that can make pulp from either hardwood or softwood) in North America and western Europe to make increasing amounts of softwood pulp (which have different uses to hardwood pulp and are therefore not in direct competition with them). This will continue to shelter these producers from the tsunami of hardwood kraft pulps expected in the next ten years.

Capacity rationalization was the main focus in Japan, North America and Western Europe in 2013, and some mills were converted from paper grade to dissolving pulp. However, China recently imposed a set of anti-dumping duties for five years on commodity or viscose dissolving tonnages from Brazil, Canada and the US. This prompted some mills to return to producing their original products, namely bleached hardwood kraft or fluff pulp[16]. The net result of the import duties is that some global capacity expansions have been postponed indefinitely; however, some conversions outside the countries most affected by the new Chinese tariffs are proceeding (Valois Vision Marketing, 2013c).

Dissolving-pulp demand continued to grow in 2013 and early 2014 to meet rising interest from the textile industry, with capacity initially growing even faster, causing price fluctuations and prompting China to impose duties on key countries (as noted above). Fluff pulp demand also sustained solid and sustainable growth as standards of living rose in Africa, Asia, the Middle East and South America, aided by higher levels of disposable income. Graph 8.1.4 shows the trend in demand for wood pulp in the UNECE subregions.

8.1.3 Paper

The paper subsector faces ongoing declines in consumption, and newsprint machines are being converted for the production of paperboard and packaging grades in mature markets.

Prices for pulp in 2013 and early 2014 were generally up at the list level; however, an increase in spot sales and higher contract discounts of 1-3% across all grades in global markets left transaction prices weaker in mid-2014 (Valois Vision Marketing, 2014d). Prices for graphic papers were generally flat to weaker as supply continued to chase falling demand in all UNECE markets.

In China, a government decree to close inefficient and polluting pulp, paper and paperboard mills reduced capacity by 7.42 million tonnes in 2013 and by 3.97 million tonnes in 2014. This decree has resulted in the closure of 38.8 million tonnes of capacity since 2005 (Valois Vision Marketing, 2014e).

The global paper subsector is recovering slowly, with many difficult reforms implemented, although more are required. The subsector continues to explore investments to reduce production costs and diversify revenue streams through green technologies (including wood-based biorefineries and biofuels). Government incentives have long been a driver of such investments, but state-run energy producers are facing heavy infrastructure costs to maintain, replace or expand existing generating capacity. As a result, electricity price increases have pushed high-energy consumers – such as mechanical pulp mills – to the brink and put them in peril. On the other hand, chemical pulp mills tend to produce their own energy by burning black liquor, and in some cases they are benefiting from government subsidies for producing bioenergy.

[16] Fluff pulp is used to make personal-care items such as disposable nappies/diapers and absorbent pads.

8.2 EUROPE

8.2.1 Paper and paperboard production

Paper and paperboard production in Europe declined by 0.8% in 2013 (table 8.2.1). Paper and paperboard exports fell by 0.4% as a result of increased competition in international markets. Imports also declined as domestic production was repositioned to meet growing packaging needs, enabling a 3.9% increase in packaging paper exports in 2013 (UNECE/FAO, 2014).

TABLE 8.2.1
Paper and paperboard balance, Europe, 2012-2014

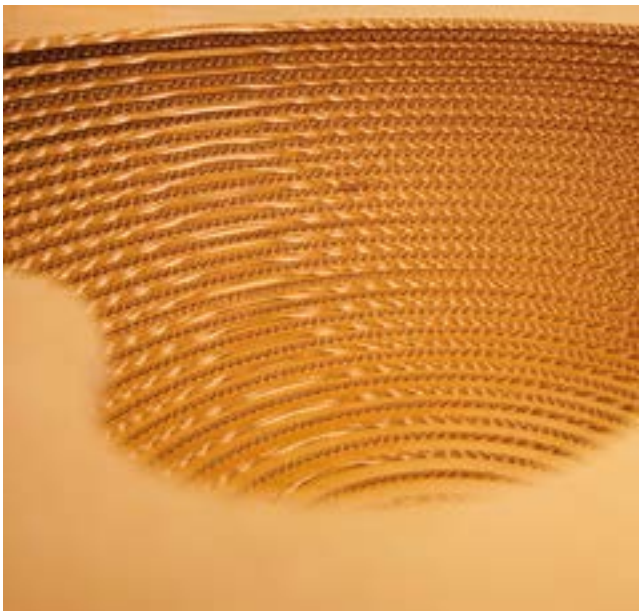
	(1,000 tonnes)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	99,171	98,377	97,980	-0.8
Imports	53,821	53,171	53,448	-1.2
Exports	63,269	62,986	62,524	-0.4
Apparent consumption	89,724	88,562	88,904	-1.3

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

European production of packaging and tissue grades increased in 2013, but the production of graphic grades declined by 3.9% as a result of capacity rationalization (table 8.2.2).

The decline in the production of graphic grades reflected the impact of increased use of electronic communication, lower readership of printed publications, and reduced advertising spending. Newsprint production declined by 4.6% in Europe in 2013, to its lowest annual output in more than 20 years. This declining trend in graphic paper production is expected to continue and to result in more mill closures.

Europe's production of packaging grades increased by 1.5% in 2013, to 46.2 million tonnes, while the production of sanitary and household papers increased by 0.8%. The production of all other grades of paper and paperboard – mainly for industrial and special purposes – increased by 2.2% as economic activity rose in the subregion.



Source: CEPI, 2014.

8.2.2 Paper and paperboard consumption

Apparent consumption of paper and paperboard fell by 1.3% in Europe in 2013 (table 8.2.1). Graphic paper consumption fell by 3.5%, while the consumption of packaging materials decreased by 0.2% and the consumption of sanitary and household papers rose by 0.5% (table 8.2.2).

European exports of paper and paperboard fell by 0.4% in 2013 but were still 3.9% higher than in 2009. Imports dropped by 1.2% in 2013, marking a 38.4% decline from the peak year of 2010 (UNECE/FAO, 2014).

Prices for paper and paperboard have trended downwards in Europe since the second half of 2011, although there are differences between grades. After relative price stability in 2011, graphic papers recorded a slow and continuous decline in 2012 and 2013. On the other hand, prices recovered for packaging grades, driven by strong demand and capacity rationalization, although conversions from newsprint to packaging grades are now adding capacity.

Source: UPM, 2013.

TABLE 8.2.2

Production and apparent consumption of paper and paperboard, Europe, 2009-2013

	(1,000 tonnes)							
	Production				*Apparent consumption*			
	2009	*2012*	*2013*	*Change (%) 2012-2013*	*2009*	*2012*	*2013*	*Change (%) 2012-2013*
Graphic papers	41,905	42,025	40,400	-3.9	37,393	35,008	33,780	-3.5
Newsprint	8,879	8,660	8,262	-4.6	9,697	8,314	7,937	-4.5
Uncoated mechanical	7,611	8,029	7,721	-3.8	6,215	6,560	6,303	-3.9
Uncoated woodfree	9,180	9,846	9,652	-2.0	8,654	9,215	9,047	-1.8
Coated papers	16,236	15,490	14,765	-4.7	12,826	10,919	10,492	-3.9
Sanitary and household papers	6,990	7,342	7,401	0.8	6,837	7,451	7,489	0.5
Packaging materials	41,853	45,533	46,213	1.5	39,664	42,986	42,896	-0.2
Case materials	24,342	26,711	27,216	1.9	24,660	26,927	27,419	1.8
Carton	9,086	9,774	9,892	1.2	7,694	8,102	7,251	-10.5
Wrapping papers	4,709	5,205	5,172	-0.6	4,085	4,336	4,497	3.7
Other papers, mainly packaging	3,716	3,844	3,932	2.3	3,225	3,621	3,729	3.0
Other paper and board	4,031	4,271	4,363	2.2	4,222	4,279	4,398	2.8
Total paper and paperboard	94,779	99,171	98,377	-0.8	88,115	89,724	88,562	-1.3

Source: CEPI, 2014; UNECE/FAO, 2014.

8.2.3 Market pulp production

Pulp production in Europe was almost unchanged in 2013, at 40 million tonnes, due largely to closures of integrated mills (table 8.2.3). Exports grew by 5.1% and imports by 1.9%; as a result, apparent consumption fell by 0.6%.

TABLE 8.2.3

Woodpulp balance, Europe, 2012-2014

	(1,000 tonnes)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	40,302	40,348	40,257	0.1
Imports	19,384	19,757	19,702	1.9
Exports	13,459	14,151	14,077	5.1
Net trade	-5,925	-5,606	-5,625	
Apparent consumption	46,227	45,954	45,883	-0.6

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

Pulp prices in Europe continued to recover between early 2013 and early 2014 as a result of economic growth. Importers facing rising prices in US dollars were shielded by a strengthening euro. Pulp mill closures and conversions, including production setbacks, were largely responsible for a tight supply-demand balance. By mid-2014, the market was expecting price weakness due to incremental capacity increases in Brazil and Uruguay.

8.2.4 Use of paper for recycling

The use of paper for recycling in CEPI[17] countries increased by 1.6% in 2013, to 47.5 million tonnes. Exports of paper for recycling to countries outside CEPI decreased by 7.1%, to 10.1 million tonnes, 93.5% of which went to Asian markets. Of the total volume of paper collected for recycling in Europe in 2013, about 80% was used in Europe and 20% was exported (CEPI, 2014).

Paper for recycling comprised 53.5% of the fibre used for papermaking in CEPI countries in 2013. Woodpulp accounted for another 46.1%, and the remainder (0.4%) comprised non-wood pulp.

8.2.5 EU policy environment and trade negotiation agenda

The EU Timber Regulation on the importation of wood and wood products was applied from March 2013. This regulation, which was adopted in 2012, aims for the complete elimination of illegal timber in the EU market through the implementation of a culture of accountability and responsibility in the private sector.

The EU and the US launched trade negotiations in 2013 to create the world's largest free-trade area. This would strengthen the major EU and US pulp and paper companies by removing

[17] Through its 18 member countries (17 EU members plus Norway), CEPI represents some 520 pulp, paper and paperboard companies across Europe.

tariffs imposed on non-fibrous raw materials (mainly chemicals). It would also lead to a significant reduction in non-tariff barriers.

Following the launch of its "Roadmap 2050", the European paper industry identified breakthrough technologies that are expected to significantly reduce energy consumption, and therefore greenhouse gas emissions, by 2030. Major European groups have established partnerships to develop pilot projects. As well as meeting the challenge of sustainable development, these breakthrough technologies should improve the competitiveness of European industries.

8.3 COMMONWEALTH OF INDEPENDENT STATES FOCUS ON THE RUSSIAN FEDERATION

CIS production of chemical woodpulp, paper and paperboard fell by 2.0% in 2013, to 15.1 million tonnes (table 8.3.1). Chemical woodpulp production fell by 0.8% due to closures and the low productivity of old and inefficient assets (UNECE/FAO, 2014). Paper and paperboard production fell by 2.8% due to market-related closures in the graphic paper subsector, where output fell by 3.3% in 2013 as a result of lower demand. Apparent consumption of graphic papers fell by 12.6%.

TABLE 8.3.1

Production of chemical woodpulp, paper and paperboard, CIS, 2012-2013

	(1,000 tonnes)		
	2012	*2013*	*Change (%) 2012-2013*
Chemical woodpulp	6,077	6,030	-0.8
Paper and paperboard	9,365	9,100	-2.8
Total	15,442	15,130	-2.0

Source: UNECE/FAO, 2014.

8.3.1 Paper and paperboard production and apparent consumption

Paper and paperboard production fell by 2.8% in 2013 as a result of unplanned or market-related downtime (table 8.3.2). Imports fell sharply while exports rose, resulting in much-improved net trade and a decline in apparent consumption of 5.2% (table 8.3.2).

TABLE 8.3.2

Paper and paperboard balance, CIS, 2012-2014

	(1,000 tonnes)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	9,365	9,100	9,296	-2.8
Imports	2,875	2,725	2,725	-5.2
Exports	2,884	2,957	2,904	2.5
Net trade	9	232	179	
Apparent consumption	9,357	8,868	9,117	-5.2

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

8.3.2 Chemical woodpulp production and apparent consumption

Chemical woodpulp production fell by 0.8% in 2013, despite the start-up of new capacity in the Russian Federation, which was destined mainly for export. Imports declined by 7.8%, exports by 2.0% and apparent consumption by 0.5% (table 8.3.3).

TABLE 8.3.3

Chemical woodpulp balance, CIS, 2012-2014

	(1,000 tonnes)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	6,077	6,030	8,451	-0.8
Imports	231	213	233	-7.8
Exports	2,260	2,214	2,201	-2.0
Apparent consumption	4,048	4,029	6,483	-0.5

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

8.3.3 Production and capacity

The production of pulp, paper and paperboard in the Russian Federation was still significantly lower in 2013 than it was in the pre-transition period of 1988-1989 (Rosstat, 2014), despite more than doubling since 1996. Contributing to recent increases is an investment project by the Ilim Group – the largest investment project in the Russian forest industry – which has many important components, such as a new manufacturing facility in Bratsk and the expansion of white-paper and coated-paper capacity in Koryazhma. The reconstruction and restructuring of the Russian pulp and paper industry continued in 2014, with some progress being made towards higher-value products and the more efficient processing of wood raw materials.

8.3.4 Russian Federation trade

8.3.4.1 Imports

The Russian annual trade deficit in paper and paperboard has grown since 2001; it ranged from $1.1 billion to $2.3 billion per year in the period 2006-2013 and was $1.8 billion in 2013. The trade deficit has grown because imports tend to be higher-

value products, such as high-quality materials for containers and packaging, coated paper and tissue, whereas exports are mainly commodity products, such as chemical pulp, newsprint and kraft linerboard.

8.3.4.2 Exports

Russian exports of pulp and paper increased after 1990, peaking in 2005. They constituted 88% of market pulp output in 2013 and 30-35% of paper and paperboard production. Major export destinations in 2013 were China (market pulp and kraft linerboard), India (newsprint), Ireland (market pulp and kraft linerboard) and Turkey (newsprint). Pulp exports exceeded 2 million tonnes in 2013, 60% of which was imported by China.

8.4 NORTH AMERICA

Another round of closures in the North American pulp, paper and paperboard industry played out in 2013 and early 2014, as financial results continued to reveal excess capacity chasing falling paper demand, itself the result of the increasing use of electronic communications, including via the Internet.

Pulp production declined across all chemical grades due to closures at integrated and market pulp facilities. Some 1.1 million tonnes of chemical pulp capacity was shut down permanently in 2013 and early 2014, while another 375,000 tonnes of capacity was converted to dissolving pulp (Valois Vision Marketing, 2014c).

Domestic demand for graphic paper continued to decline as a result of lower advertising budgets for print advertising and growth in the use of electronic media for data transmission and information dissemination. Consumers continued to opt out of paper bills and statements, mainly from financial institutions and mutual fund managers. Further paper-machine closures are anticipated and restarts seem unlikely.

On 6 April 2014, following a preliminary ruling in November 2013, the Chinese Government, through its Ministry of Commerce, imposed a final duty on commodity or viscose dissolving-pulp grades from Brazil, Canada and the US, leading to the indefinite postponement of many proposed expansions in North America. Prices in China had fallen below domestic producers' cost of production. The final duties range from 6.8% to 11.5% for Brazil; from no duties to 23.7% for Canada; and from 18.7% to 33.5% for the US. The duties will be in place for five years (CCFGroup.com, 2014).

8.4.1 Production and apparent consumption

North America's apparent consumption of paper and paperboard, which had been declining for years, reached a thirty-year low in 2012 before increasing by 0.4% in 2013. Despite capacity closures in graphic papers and paperboard following negative earnings, mergers and acquisitions, North American paper and paperboard production edged higher (by 0.2%) in 2013, the result of increased output at remaining sites (table 8.4.1). The growth of electronic data transfers continued at the expense of paper. The paperboard subsector saw gains in profits, however, as a result of major consolidation among producers, led by capacity rationalization and strong demand for packaging (due in part to online shopping).

TABLE 8.4.1

Paper and paperboard balance, North America, 2012-2014

	(1,000 tonnes)			
	2012	*2013*	*2014f*	*Change (%) 2012-2013*
Production	82,130	82,324	82,815	0.2
Imports	11,832	12,372	12,466	4.6
Exports	19,985	20,450	20,704	2.3
Net trade	8,153	8,078	8,238	
Apparent consumption	73,977	74,247	74,577	0.4

Note: f=2013 Committee on Forests and the Forest Industry forecast.
Source: UNECE/FAO, 2014.

North American paper and paperboard imports rose by 4.6% in 2013, with increased volumes from Asia, while exports grew by 2.3%.

The decline in the production of graphic paper in North America continued in 2013 as capacity was reduced due to falling demand (table 8.4.2). Graphic paper production fell by 9.5% in the period 2009-2013, but paperboard (packaging material) output grew by 10.8%. Higher prices in 2013 led to plans for incremental capacity increases of 1.1 million tonnes in paperboard production in 2014-2015, following a similar increase in 2013 (Valois Vision Marketing, 2014d).

The production of newsprint fell by 4.5% in 2013, driven by capacity rationalization, including conversions to packaging grades, for which margins were higher. A downgrading by advertisers from higher-priced coated grades (to reduce costs) led to a rise in uncoated mechanical production of 3.8% and a decline in coated-paper production of 5.0%. Uncoated-freesheet production fell by 3.5%.

North American newsprint apparent consumption fell by 6.56 million tonnes between January 2004 and December 2013. North American newsprint capacity was 6.7 million tonnes in 2014, less than half the capacity of 15 million tonnes in 2000 (UNECE/FAO, 2014; M. Valois own data).

North American apparent consumption of graphic papers dropped to 23.6 million tonnes in 2013, a decline of 4.1% over 2012 (table 8.4.2 and graph 8.4.1). Newsprint apparent consumption declined by 13.3%, while the consumption of coated papers declined by 4.1% and of uncoated freesheet by 2.8%. The only increase in apparent consumption in 2013 was in uncoated mechanical paper, which rose by 4.4% as advertisers cut costs by downgrading from coated freesheet and coated mechanical papers.

In contrast, the apparent consumption of paperboard increased by 2.2% in 2013, to 43.2 million tonnes, imports grew by 8.6%, and exports rose by 1.0%.

TABLE 8.4.2

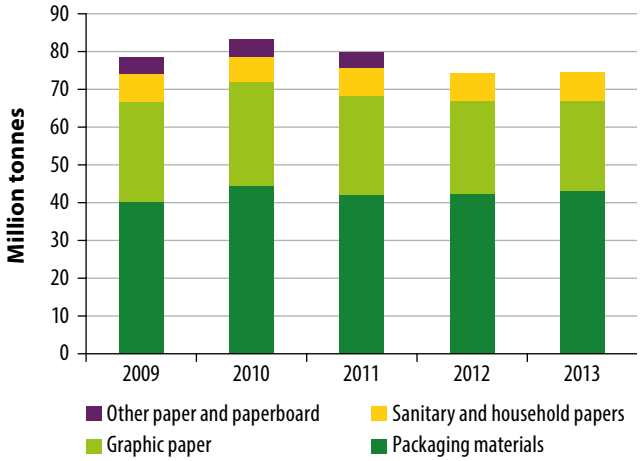
Production and apparent consumption of paper and paperboard, North America, 2009-2013

	(1,000 tonnes)							
	Production				Apparent consumption			
	2009	2012	2013	Change (%) 2012-2013	2009	2012	2013	Change (%) 2012-2013
Graphic papers	28,052	26,198	25,376	-3.1	26,693	24,635	23,621	-4.1
Newsprint	7,370	6,748	6,442	-4.5	5,356	4,663	4,044	-13.3
Uncoated mechanical	4,870	3,652	3,790	3.8	4,799	3,664	3,826	4.4
Uncoated wood-free	8,979	8,847	8,539	-3.5	8,986	8,782	8,536	-2.8
Coated papers	6,833	6,951	6,605	-5.0	7,552	7,526	7,215	-4.1
Sanitary and household papers	7,322	7,270	7,551	3.9	7,344	7,330	7,663	4.5
Packaging materials	44,568	48,662	49,397	1.5	40,105	42,261	43,206	2.2
Case materials	30,725	32,838	33,323	1.5	27,435	28,681	29,375	2.4
Carton	6,057	7,045	7,154	1.5	5,123	5,374	5,498	2.3
Wrapping papers	1,422	3,179	3,242	2.0	1,142	2,609	2,654	1.7
Other papers, mainly packaging	6,364	5,600	5,678	1.4	6,405	5,597	5,679	1.5
Other paper and board	4,236	0	0	0.0	4,300	249	243	-2.3
Total paper and paperboard	84,178	82,130	82,324	0.2	78,443	73,977	74,247	0.4

Source: UNECE/FAO, 2014.

GRAPH 8.4.1

Apparent consumption of paper and paperboard, North America, 2009-2013



Source: UNECE/FAO, 2014.

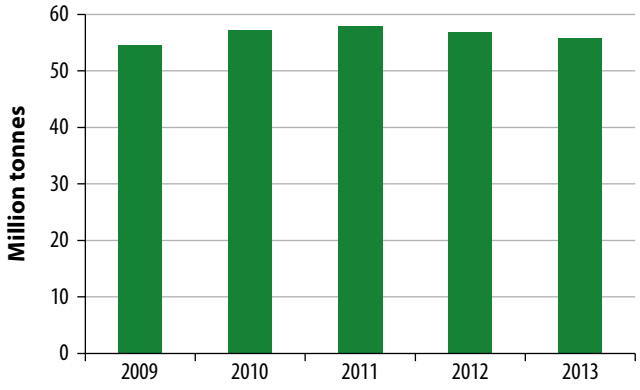
The production of chemical woodpulp declined by 1.6% in 2013 (graph 8.4.2) as less-competitive capacity was closed permanently. A weakening in the Chinese economy was the source of deteriorating list and spot prices in mid-2014. Rationalization and consolidation in the North American paperboard sector, following significant merger and acquisition activity, caused a drop in integrated capacity in 2013.

The modest recovery seen in North America in the market for chemical market pulp in the second half of 2012 and early 2013 was driven almost entirely by Asian demand. Doubts about the sustainability of this recovery grew in mid-2013 as a slower Chinese economy led to weaker exports, tighter credit markets and sluggish demand for graphic paper, while there was strong growth in graphic paper capacity among Asian players. In contrast, packaging, sanitary and facial-tissue segments were stronger in Asia due to increased online shopping and higher standards of living. Major investments in incremental capacity were visible in China and Indonesia (Valois Vision Marketing, 2014e).

Source: UPM, 2013.

GRAPH 8.4.2

Production of chemical wood pulp, North America, 2009-2013



Source: UNECE/FAO, 2014.

8.5 EXTRA-REGIONAL INFLUENCE ON THE UNECE REGION

8.5.1 South America

8.5.1.1 Pulp, paper and paperboard production in Brazil

Pulp capacity expanded in Brazil in 2013 and the first half of 2014, with three mills starting and ramping up bleached eucalyptus kraft production, adding a total of 4.5 million tonnes of annualized capacity (an increase of 14.1%) (Valois Vision Marketing, 2014f). By the end of 2017, Brazil's chemical market pulp capacity will have grown by over 50% since the end of 2013. These new mills are expected to increase their capacity and will all be based on plantation forests that have been genetically engineered to maximize yields and enhance desirable product attributes.

Brazilian production of pulp, paper and paperboard reached 25.6 million tonnes in 2013, a 5.9% increase over 2012 (table 8.5.1). With one new mill going into commercial production in December 2012, pulp production rose by 8.2% in 2013, to 15.1 million tonnes. Paper and paperboard production was 1.8% higher in 2013 than in 2012, at 25.6 million tonnes, based on strong domestic demand for printing, writing and tissue products.

TABLE 8.5.1

Pulp, paper and paperboard production, Brazil, 2012-2013

	(1,000 tonnes)		
	2012	*2013*	*Change (%) 2012-2013*
Pulp	13,977	15,129	8.2
Paper and paperboard	10,260	10,444	1.8
Total	24,157	25,573	5.9

Source: Ibá, 2014.

Brazil exported more than 9.4 million tonnes of pulp in 2013, which was 62.3% of production (table 8.5.2). This export volume was an increase of 10.8% over 2012 (when 8.5 million tonnes were exported – 60.9% of that year's production) (Ibá, 2014).

TABLE 8.5.2

Woodpulp balance, Brazil, 2012-2013

	(1,000 tonnes)		
	2012	*2013*	*Change (%) 2012-2013*
Production	13,977	15,129	8.2
Domestic sales	1,656	1,723	4.0
Exports	8,513	9,429	10.8
Imports	411	430	4.6
Apparent consumption	5,875	6,130	4.3

Source: Ibá, 2014.

On the other hand, most paper and paperboard produced in Brazil is consumed internally and exports account for only 17.9% of production (table 8.5.3). Brazil's domestic paper producers – particularly in the graphic sector – have complained about "pirate" imports disguised as duty-free paper, which is intended only for use in editorial and cultural applications. Import tariff differentials between duty-free and commercial papers can be as high as 40%. As a result, many shipping containers are searched.

TABLE 8.5.3

Paper and paperboard balance, Brazil, 2012-2013

	(1,000 tonnes)		
	2012	*2013*	*Change (%) 2012-2013*
Production	10,260	10,444	1.8
Domestic sales	5,556	5,712	2.8
Exports	1,875	1,866	-0.5
Imports	1,396	1,274	-8.7
Apparent consumption	9,780	9,836	0.6

Source: Ibá, 2014.

8.5.1.2 Chile

Chile continued to experience general growth in its pulp, paper and paperboard sector in 2013. New paper and tissue machines entered production, and pulp mills were made more productive by the removal of bottlenecks in the manufacturing process.

TABLE 8.5.4
Pulp, paper and paperboard exports, Chile, 2012-2013

	(1,000 tonnes)		
	2012	2013	Change (%) 2012-2013
Bleached radiata kraft	1,900	1,998	5.1
Bleached eucalyptus kraft	2,023	2,085	3.1
Unbleached radiata kraft	402	474	17.8
Newsprint paper	161	97	-39.7
Paperboard	324	313	-3.5
Total	4,810	4,966	3.2

Source: Chilean Customs Service, 2014.

Chilean export volumes of pulp, paper and paperboard reached 4.97 million tonnes in 2013, up by 3.2% compared with 2012 (Table 8.5.4). Aggregate pulp exports rose by 5.3%, aided by productivity-gains projects, but newsprint exports fell by 39.7% due to a major closure caused by high electricity costs.

8.5.2 Asia

8.5.2.1 China overview

China was rocked by an economic "slowdown" in 2013. Gross domestic product growth fell to "only" 7.7% after years when it had been as high as 10% (China National Bureau of Statistics, 2014). The Chinese Government, through the Ministry of Industry and Information Technology, continued to force the closure of inefficient and polluting pulp and paper equipment in 2013, amounting to a reduction of 7.4 million tonnes in capacity. The planned closed capacity for 2014 is much lower than that, however, at 3.97 million tonnes.

After years of rapid growth, China's paper and board production declined by 1.4% in 2013; consumption was also weaker, down by 2.7% (table 8.5.5). Significant investment continues in the industry, although several tissue-machine expansions have been scaled back from the overambitious plans announced in recent years.

In China, weak exports due to trade issues involving anti-dumping and countervailing duties in Brazil and Europe, along with excess capacity across several paper and paperboard grades, led to lower production rates.

Low paper prices (the result of an imbalance between supply and demand) and weaker Asian trade make a full recovery of the global pulp market highly doubtful in 2014. Incremental capacity in hardwood grades exceeds demand, putting pricing under downward pressure and potentially affecting long-fibre (softwood) pulp prices.

TABLE 8.5.5
Production and apparent consumption of pulp, paper and paperboard, China, 2013

	(1,000 tonnes)			
	Production		Apparent consumption	
	2013	Change (%) 2012-2013	2013	Change (%) 2012-2013
Pulp	76.5	1.9	93.5	3.4
Paper and paperboard	101.0	-1.4	97.8	-2.7

Source: China Paper Association, 2014.

8.5.2.2 Chinese pulp imports

Kraft pulp imports rose to a record 13.6 million tonnes in 2013, a 1.6% increase over 2012, while total pulp imports grew by 2.3%, to 16.9 million tonnes. Dissolving-pulp imports, driven by growing rayon demand in the garment industry, increased by 14.2%, to 1.8 million tonnes (table 8.5.6).

TABLE 8.5.6
Pulp imports, China, 2011-2013

	(1,000 tonnes)			
	2011	2012	2013	Change (%) 2012-2013
Kraft	11,707	13,378	13,588	1.6
Mechanical	1,401	1,417	1,388	-2.0
Dissolving	1,146	1,579	1,804	14.2
Other	185	119	87	-26.9
Total	14,439	16,493	16,866	2.3

Source: China Customs Bureau, 2014.

With a growing papermaking asset base in China, the need for fibre is also increasing, and one of the largest sources of raw material remains recovered paper. China's recovered paper imports fell by 2.8% in 2013, to 29.2 million tonnes (table 8.5.7).

TABLE 8.5.7
Recovered paper imports, China, 2012-2013

	(million tonnes)			
	2012	Share of total (%)	2013	Share of total (%)
Imports in China	30.1	100	29.2	100
Of which from the US	14.1	47	13.3	45
US exports	20.1	100	18.9	100
Of which to China	14.1	70	13.3	70

Source: China Customs Bureau, 2014; US Bureau of Census, 2014.

According to the US Bureau of Census (2014), 45.4% of Chinese recovered paper imports were sourced from the US in 2013, down from 47.0% in 2012 and 52.5% in 2011. The decline is attributed to higher prices, driven by stronger US domestic demand.

Note: The statistical annex of the *Forest Products Annual Market Review 2013-2014* is available at: www.unece.org/forests/fpamr2014-annex.html

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9 WOOD ENERGY

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HIGHLIGHTS

- The most recent data show an increase in wood energy consumption in the UNECE region.
- Solid biofuels, of which the vast majority is wood, accounted for 10.5% of primary energy production in the EU27 in 2012.
- Consumption of wood pellets continues to expand in the EU, with the EU27 consuming 15.1 million tonnes in 2012.
- The European Commission indicated that mandatory sustainability criteria for solid and gaseous biomass would not be introduced before a new post-2020 climate and energy policy framework is finalized.
- The production and consumption of wood energy in the western Balkans continued to grow in 2013, and there was also a strong focus on exports (22.6% of wood fuel production was exported).
- Wood pellet production capacity in the western Balkans increased by 30% in 2013, reaching 1.1 million tonnes.
- Wood pellets exported from North America to the EU reached a new high of 4.6 million tonnes in 2013. Current and expected prices in the EU will likely encourage continued growth in wood pellet exports.
- The US Government has proposed stricter rules for emissions from residential stoves and power plants. A proposed rule to be finalized by June 2015 aims to reduce carbon emissions from the electricity sector by 30% from 2005 levels by 2030.
- ENplus certification is becoming the most recognized (non-industrial) quality standard for wood pellets, with many companies already certified in North America and several applying for certification in the CIS.
- There has been a strong increase in domestic demand for wood energy products in CIS countries.
- Russian pellet production remained at 1.5 million tonnes in 2013, with the lack of growth primarily a result of legal disputes, but production could reach 2 million tonnes in 2014.
- Russian regional governments are stimulating domestic wood energy markets.
- Russian wood pellet producers are re-orienting from industrial power markets to supply end-consumer heat markets, both domestically and in Europe.

9.1 INTRODUCTION

Wood energy continues to be price-competitive compared with fossil-fuel alternatives in the European subregion. Governments have contributed to this by defining renewable energy mandates and providing various types of financial support to promote wood energy use. In the residential heating sector, wood energy is already largely competitive without government intervention but its use may be limited by initial equipment costs. In 2013, strong European demand led to increased imports of industrial and residential pellets from across the UNECE region. The major feature of the North American wood energy market continues to be wood pellet exports to Europe. Proposed US rules for a 30% reduction (from 2005 levels) in carbon emissions in the electricity sector by 2030 will influence future demand for wood energy and other renewables. In the CIS, particularly the Russian Federation and Belarus, briquettes, wood chips and wood pellets are increasingly being used domestically. Wood pellet production is expected to increase in 2014 as capacity expands in the Russian Federation's far east. Public policy and competing energy sources, coupled with geopolitical issues, are among the most important factors influencing wood energy markets in the UNECE region.

There has been some improvement in the availability of data on wood energy markets. The World Customs Organization Harmonized System (HS2012) now includes wood pellets under the code 440131. Information on the production and trade of wood pellets can now be found in international statistics such as Eurostat, the UNECE and FAO databases.

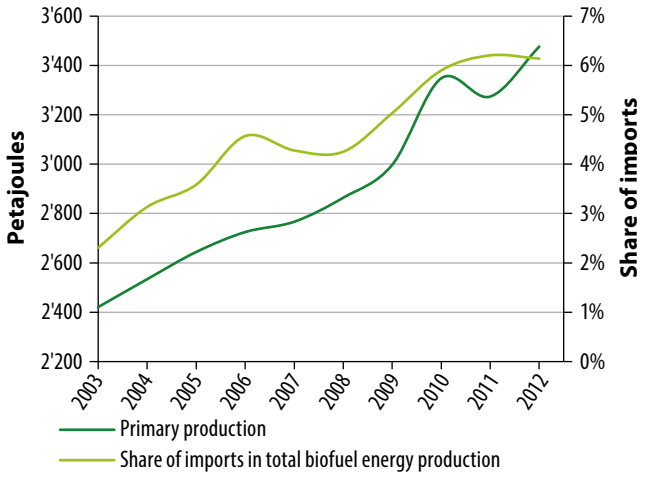
9.2 EUROPE

9.2.1 Consumption and production

Now that Eurostat is recording solid biofuel use (excluding charcoal), replacing the product category "wood and wood waste" (Eurostat, 2014a), it can be seen that primary energy production from solid biofuels[18] in the EU27 increased from 3,274 PJ in 2011 to 3,476 PJ in 2012. Solid biofuels accounted for 10.5% of total primary energy production in the EU27, a considerable increase from the 6.2% share in 2003. Since 2003 there has been strong upward growth in the EU27 in both primary production and the share of imported solid biofuels used for primary energy production (graph 9.2.1).+

GRAPH 9.2.1

Total primary energy production from solid biofuels in the EU27, 2003-2012



Notes: Primary production is expressed both in PJ and as the share of imports. Data exclude charcoal, its corresponding relative contributions to total primary energy production and to imported solid biofuels in the EU27.
Source: Eurostat, 2014a.

In 2012, total wood pellet production in the EU27 was estimated at about 11 million tonnes, with an average plant utilization of 60% of installed capacity (Flach et al., 2013; Gautier, 2014). EU27 wood pellet consumption exceeded 15.1 million tonnes in 2012, and early estimates suggest it reached 19 million tonnes in 2013 (Gautier, 2014). The main pellet producers in the EU27 in 2012 were Germany (2.2 million tonnes), Sweden (1.3 million tonnes) and Austria (0.9 million tonnes) (Flach et al., 2013). The United Kingdom (4.5 million tonnes), Denmark (2.5 million tonnes) and the Netherlands (2.0 million tonnes) are the largest consumers of wood pellets in the EU27. Wood pellet use for heating (10 million tonnes) surpassed use in power plants (9 million tonnes) in the EU27 in 2013 (Gautier, 2014).

The trend indicates that many EU27 countries will become net importers of wood pellets in the long term. German manufacturers are reaching maximum capacity; it is likely that Germany will become a net importer in the near future. Italy's pellet production is declining due to a rise in the price of raw materials, while domestic demand is growing, mainly in the residential heating sector. More than 90% of the wood pellets consumed in Italy in 2013 were imported (Paniz and Bau, 2014). The residential pellet market is expected to grow substantially in Spain and Greece.

The heating market for wood energy is developing quickly in most of Europe. Companies importing pellets from North America for the electricity sector have started delivering to local heating markets in bulk and in consumer bags, in search of more lucrative resale prices.

[18] This includes: fuelwood, wood residues and co-products, wood pellets, bagasse, black liquor, animal waste and other vegetal materials and residues.

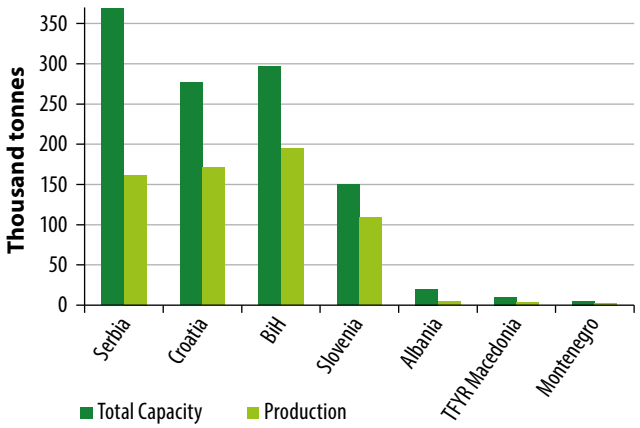
According to some forecasts, European pellet consumption will reach 35 million tonnes by 2020 (Murray, 2014). Growing demand will be met from both outside and within Europe. Argus Biomass (2014) reported a temporary oversupply of wood pellets for residential use in the EU in April 2014, partly caused by an exceptionally mild winter. It also reported high levels of industrial wood pellet stocks, possibly an indicator that the industry is anticipating growth in demand from power generators later in 2014. For example, the port of Rotterdam is increasing its wood pellet storage capacity (Du Mez, 2014).

Countries in the western Balkans are an increasingly important source for supplying wood pellets to the major markets within the EU, such as Italy, Germany and Austria. The production and consumption of all wood fuel types continued to expand in the western Balkans[19] in 2013. The total consumption of wood energy in the seven countries in the area was estimated at 133 PJ, with firewood accounting for 91.7% of this total. The growth in wood energy consumption occurred mainly in the form of wood pellets and wood chips. The countries of the western Balkans remain a net exporter of wood energy.

The 2013 production of wood pellets increased by 64% over 2012 in the western Balkans, reaching 648,104 tonnes. The increase was the result of new manufacturing capacity, particularly in Serbia, where nine new factories with a total annual capacity of 113,610 tonnes started operation. Serbia leads the western Balkans in wood pellet production, with a total capacity of 368,000 tonnes. There are now 83 pellet-manufacturing facilities in the western Balkans, which had an estimated capacity of 1.1 million tonnes in 2013, up by 292,000 tonnes from 2012 (Glavonjić, 2014). Such a rapid increase in new plants and capacity is the result of strong prospects for wood pellet demand in domestic and export markets. Due to limited raw-material availability, however, the production of wood pellets is significantly lower than total capacity[20], with utilization at only 58% (graph 9.2.2).

GRAPH 9.2.2

Wood pellet production, capacity and consumption in the western Balkans, 2013



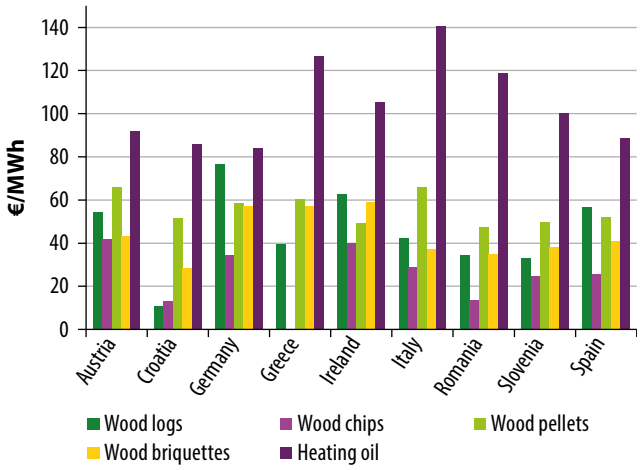
Note: BiH = Bosnia and Herzegovina.
Source: Glavonjić, 2014.

9.2.2 Prices

Krajnc et al. (2014) compiled 2013 retail energy prices for various wood fuels – chips, briquettes, logs and pellets – and compared them with domestic heating-oil prices in selected European countries. Of the wood fuel options, pellets achieved the highest average price per MWh (graph 9.2.3). Prices, which were collected at the end and beginning of the heating season (April and September/October), did not include the cost of delivery of wood fuels or the installation and maintenance costs of equipment.

GRAPH 9.2.3

Wood energy feedstock and heating oil prices for selected European countries, 2013



Note: Including VAT.
Source: Krajnc et al., 2014.

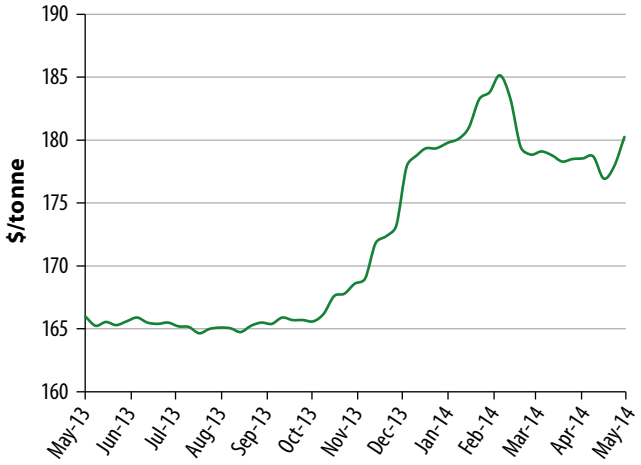
[19] Albania, Bosnia and Herzegovina, Croatia, Kosovo, Montenegro, the former Yugoslav Republic of Macedonia Serbia and Slovenia.

[20] Capacity utilization rates for many pellet producers in the UNECE have been relatively low. In many cases, this is a result of anticipating stronger demand in the future and because cost effective raw material supply, namely sawdust, has been constrained since 2009.

Argus Biomass (2014) reported that industrial wood pellets reached a spot cost[21], insurance and freight (CIF) price at Amsterdam, Rotterdam and Antwerp (ARA) of $180.25 per tonne in May 2014, a significant increase compared with May 2013, when the CIF price was $166 per tonne (graph 9.2.4). Industrial wood pellet spot prices have averaged $180 per tonne in ARA since the end of 2013. Average ninety-day free-on-board (FOB) spot prices in Portugal and the port of Riga[22] were lower than CIF prices in ARA; in March 2014, the FOB price in Portugal and Riga was about $125 per tonne. Forecasts by Argus Biomass (2014) indicate sustained price increases for wood pellets for the rest of 2014 and the beginning of 2015.

GRAPH 9.2.4

Wood pellet cost at Amsterdam, Rotterdam and Antwerp, 2013-2014



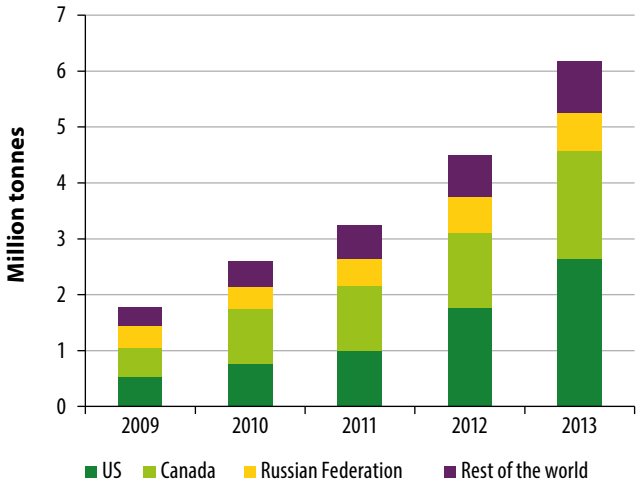
Note: CIF prices ($ per tonne) within 90 days (spot).
Source: Argus Biomass, 2014.

9.2.3 Trade

Trade within the Europe subregion includes briquettes, wood chips and both industrial and premium (residential) pellets. Despite ample capacity in the EU to manufacture pellets, imports continue in high volumes because of their price competitiveness and the high quantities demanded in contracts. Transatlantic trade is still dominated by industrial pellets. Nevertheless, non-industrial pellet imports are increasing and have attracted the attention of overseas producers. The supply chains in the industrial and residential pellet markets are becoming more integrated (Dale, 2014). There was considerable growth in wood pellet imports in the period 2009-2013 (graph 9.2.5), with Canada and the US continuing as the main exporters of wood pellets to the EU27. North America supplied 4.6 million tonnes of the 6.2 million tonnes imported by the EU27 in 2013.

GRAPH 9.2.5

EU27 imports of wood pellets, 2009-2013



Source: Eurostat, 2014b.

Wood energy exports from the western Balkan countries are driven by undeveloped domestic markets, the comparatively higher prices in central and northwest Europe, a lack of public incentives to support wood energy use, and the slow pace of replacing fossil fuels in district heating systems.

The countries of the western Balkans exported an estimated 36 PJ (4.6 million m^3) of wood energy in 2013, with firewood constituting the largest component (48.3% by volume), followed by pellets and wood chips (Glavonjić, 2014). Wood energy exports accounted for 22.6% of total wood fuel production in the western Balkans in 2013.

9.3 COMMONWEALTH OF INDEPENDENT STATES

9.3.1 Consumption and production

Demand for wood energy feedstock, including chips, briquettes and pellets, is increasing rapidly in all CIS countries as a substitute for fossil fuels. The development of the Russian wood energy market is impeded, however, by an uncertain investment climate, which was improving (Doing Business, 2013) until the geopolitical unrest in Ukraine. Nevertheless, companies from China, Japan, the Republic of Korea and Sweden are making substantial investments in the Russian pellet market. For example, Mitsui bought a 40% share in the Baikal Forest Company and plans to invest 988.5 million roubles ($28.5 million) in pellet production (Belarusian Universal Commodity Exchange, 2013). While this is a hopeful sign, geopolitical developments may still affect future wood energy investments in the Russian Federation.

Wood pellet production in the Russian Federation remained at about 1.5 million tonnes in 2013 but could reach 2 million tonnes in 2014 (Glukhovskiy and Hartkamp, 2014). Legal

[21] The current market price at which a product is bought or sold for immediate payment and delivery.

[22] The index is based on exports from Riga, with differentials supplied for the ports of Klaipeda, Liepaja, St Petersburg, Tallinn, Ventspils and Vyborg.

disputes with large producers in the northwest and far east of the country caused a curtailment in the first half of 2013 (LesOnline, 2014). In the Russian Federation, pellets are produced mainly for international markets, with roughly 200,000 tonnes per year consumed domestically (V. Glukhovskiy, personal communication, 2014). Domestic demand is growing, however, and new wood pellet plants are being built solely to meet this increased demand. There is no current shortage of raw materials at most plants.

The Russian Federation expanded briquette production capacity in 2013, to approximately 1 million tonnes. Actual production increased to about 350,000 tonnes, of which roughly half was exported (E.L. Ivin, personal communication, 2014). A recent analysis by Indufor (2013) suggested that the regions of Amut, Promorsky, Sakha Republic and Khabarovsk hold good prospects for the production of wood pellets.

Source: Vapo, 2014.

In Belarus, increasing volumes of wood chips are being used in district heating and small combined heat-and-power (CHP) plants. The company Vitebskenergo recently opened a CHP plant, running mainly on wood chips, in the city of Baran (11.7 GJ capacity) (Belta, 2014a). Belarus is substantially increasing its exports of wood chips (FAOSTAT, 2014), with export revenues increasing by 61.5% in 2013 (Ministry of Forestry Belarus, 2014a). In the first quarter of 2014, the forestry enterprises of Belarus obtained a 50.7% increase in revenue from exported wood energy products (Ministry of Forestry Belarus, 2014b). In 2013, Belarus produced 942,500 m^3 of wood chips and exported around 200,000 m^3 (Belta, 2014b); in 2014 the government planned to increase this volume to 350,000 m^3 (Belles Export, 2013). In 2015, production is planned to exceed 1.4 million m^3.

In Belarus, wood chips are sold via a central auction, the Belarusian Universal Commodity Exchange, and delivered at the frontier by rail. The Government of Belarus sold wood briquettes and pellets via central auction for the first time in August 2013 (Ministry of Forestry Belarus, 2014c). An increasing number of private companies are also now manufacturing these wood energy products.

In Ukraine, wood pellet and briquette production grew by 9% in 2013, to over 650,000 tonnes. Although the domestic solid biomass market for heating grew by 60% (to an installed capacity of 493.2 GJ), the export ratio of solid biomass increased from 60% to 70% in 2013 (Biznes, 2014). These figures are expected to be significantly lower in 2014 because of the ongoing unrest in Ukraine, resulting in fewer goods being transported out of the country and because, in many cases, the cost of exporting wood pellets, briquettes and firewood has doubled (H. Van Haute, personal communication, 2014).

9.3.2 Prices

The general trend throughout the CIS region has been for the price of wood fuel to increase. In the Russian Federation, for example, the price increased by about 8% in 2013, continuing a three-year upward trend. Domestic prices for wood pellets decreased by 6% in 2013 after a rise of 34% in 2012 (LesOnline, 2014). FOB prices for wood pellets were lowest per tonne in the Russian Far East (€90, or $119) and highest in the Saint Petersburg area (€110, or $145). Prices generally remained stable, except in Saint Petersburg, where they rose by 10-15% over the winter (S.E. Perederi, personal communication, 2014). Exporters in the area also benefited from the devaluation of the rouble in 2013 and early 2014.

Most delivery contracts for Russian briquettes are signed in summer and have stable prices. Traders pay up to €110 ($145) per tonne for free-carrier briquettes. Prices were relatively stable for most of 2013 but rose by a maximum of 50% above average in December (S.E. Perederi, personal communication, 2014).

At the first auction in Belarus, average prices for wood pellets and briquettes were €99.48 ($135) and €96.29 ($130) per tonne, respectively (one year contract, fixed price). At the second auction, the price of briquettes increased to €105.85 ($144) per tonne (Ministry of Forestry Belarus, 2014d).

9.3.3 Trade

The Russian Federation exported an estimated 1.15 million tonnes of wood pellets to the EU in 2013 and 150,000 tonnes to the Republic of Korea. The EU imported roughly 46% of Russian wood pellet production, of which 53% went to Denmark, 32% to Sweden and 16% to other EU countries. Roughly half the exports were loaded at harbours in the Gulf of Finland. Some 30-40 Russian producers export wood pellets, ten of which accounted for about 80% of exports in 2013 (Glukhovskiy and Hartkamp, 2014).

In addition to industrial wood pellets, most companies in the CIS have become interested in exporting to European consumer heating markets in consumer bags and/or in bulk. Several companies are pursuing ENplus certification to increase access to the European pellet market and secure higher prices; in northwest Europe, the price for A1 ENplus certified pellets is around 15-30% more than the price for non-certified pellets (Hartkamp, 2014). This pellet quality certificate is in demand

by end-users, while power generators require sustainability certificates, which are required for eligibility for subsidies.

9.4 NORTH AMERICA

9.4.1 Consumption and production of energy wood

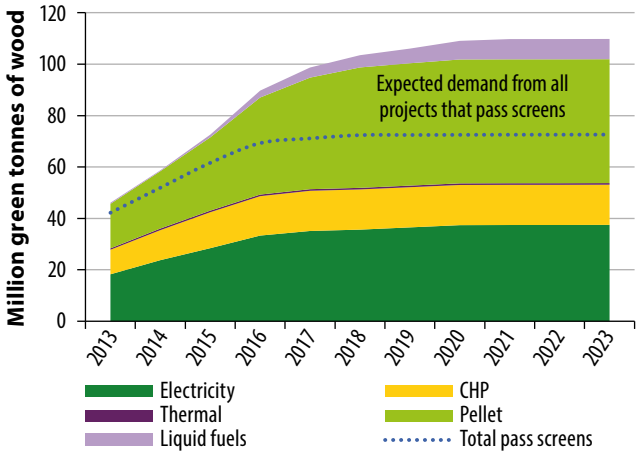
Canada consumed about 211 PJ of bioenergy from woodfuels (which include fuelwood, wood pellets and solid wood residues) in 2012, about 15 PJ less than in 2011, and generated approximately 247 PJ from pulping liquors in pulp and paper mills, an increase of 7 PJ compared with 2011 (Statistics Canada, 2013a). In 2012, about 8% of Canadian manufacturing energy demand was met by bioenergy, including wood pellets and other wood-based fuels (Statistics Canada, 2013b), and wood also provided 6% of Canada's residential heating (Statistics Canada, 2013c). The consumption of wood-based electricity remains low, with only about 130 GW of electricity generation capacity installed countrywide (see the 2012 edition of the Market Review for more detail).

The US used 2,255 PJ of wood energy in 2013, which was 23% of renewable energy consumption and 2.2% of total primary energy consumption. The total wood energy usage was up 6% over 2012, most likely because of an increase in residential use. Wood energy's share of renewable energy consumption remains about the same as it was in 2012 (US DOE, 2014a). The residential use of wood energy declined from a high in 1985 to a low in 2001 and has since increased again; the level in 2013 was last achieved in 1990.

In 2014, the US Department of Energy (DOE) Annual Energy Outlook projected a 47% increase in wood energy by 2030, to 3,340 PJ (US DOE, 2014b). A recent analysis projected major growth in wood pellet manufacturing capacity in the US, rising from just over 17 million green tonnes in 2013 to over 48 million green tonnes by 2020 (graph 9.4.1). In line with US DOE projections, the analysis foresaw significant growth in the use of wood for electricity generation. Commercial feasibility limits suggest that the annual production of wood for energy may level off at about 70 million green tonnes by 2017 (Forisk Consulting, 2014).

GRAPH 9.4.1

Forecasted use of wood by announced facilities in the US, 2013-2023



Note: Total pass screens=expected demand comprises estimated wood use by all projects that pass technology and status screens. Forisk uses a two-part screening methodology to estimate project viability: 1) technology; and 2) status. If the technology is viable today then the project passes the technology screen. If a project has two or more necessary permits, contracts, or financing commitments, it passes the status screen. "Likely" projects pass both screens.
Source: Forisk Consulting, 2014.

Canada and the US produced 1.7 million and 4.1 million tonnes of wood pellets, respectively, in 2012 (FAOSTAT, 2014). Canada has 38 operational wood pellet plants, with an estimated capacity of 3.3 million tonnes per year, currently producing about 1.8 million tonnes (Biomass Magazine, 2014a). A number of other facilities are under construction, potentially adding another 0.84 million tonnes of manufacturing capacity by the end of 2014 (Wood Pellet Association of Canada, 2014).

According to Biomass Magazine (2014b), the annual wood pellet production capacity of 122 operational plants in the US amounts to 10 million tonnes; another nine plants are under construction, potentially adding 2.7 million tonnes to current capacity. The US south experienced huge growth in pellet production capacity in 2012 and 2013, tripling pellet production in just two years (Wood Resources International, 2013). Illustrating the growing demand for North American wood pellets, Rentech (2013) is developing two new plants in Canada with a combined capacity of 0.55 million tonnes per year; these facilities should be operating by late 2014. A pellet export facility is being built at the port of Quebec, which may spur uptake of pellet capacity and the development of new production facilities in eastern Canada (Biomass Magazine, 2014c).

9.4.2 Prices

Wood-based energy in Canada is largely dependent on feedstock price. In 2013, wood pellets traded at around $152 per tonne FOB, with spikes of up to $165 per tonne in early 2014 (Wood Pellet Association of Canada, 2014). The cost of wood chips in the domestic market ranged from $78 per tonne in 2013 to $66 in early 2014 (Statistics Canada, 2014). The price of wood co-products (including sawdust, chips and roadside residue) varies, but the estimated average is $49 per tonne (IRENA, 2012). Tracking future wood chip pricing may be facilitated by the wood chip price index released by FOEX and Wood Resources International (WRI) in early 2014 (Reuters, 2014). BC Hydro (2013) estimated that generating electricity from wood in British Columbia costs about 4.5 cents/kWh.

In the US, US DOE (2014a) estimated the average price of wood energy at:

- Residential sector: $12.11/GJ (4.36 cents/KWh);
- Commercial sector: $5.13/GJ (1.85 cents/kWh);
- Industrial sector: $2.47/GJ (0.89 cents/kWh);
- Electricity sector: $2.20/GJ (0.79 cents/kWh).

Dungate (2014) reported US wood pellet prices (bulk, FOB plant) per tonne at $145-$170 in the northeast, $140-$160 in the midwest, $145-$169 in the southwest, and $150-$169 in the northwest and mountain region.

9.4.3 Trade

The volume of wood pellet exports from Canada was reported to be 1.64 million tonnes in 2013, with a value of $253 million (Statistics Canada, 2014). The main destinations for these exports were the United Kingdom (63%), Italy (13%), the US (9%) and the Republic of Korea (7%). After several years of relatively flat growth, Canadian exports to Europe climbed by 25% between 2011 and 2012, and wood pellet exports to the United Kingdom increased by 29% between 2012 and 2013 (Canadian Biomass, 2013; Statistics Canada, 2014). The export of wood pellets to the Republic of Korea strengthened in 2013, reaching 113,000 tonnes (Biomass Magazine, 2014c).

Wood pellet exports from the US nearly doubled in 2013, reaching about 2.9 million tonnes, which was an increase of 1.4 million tonnes compared with 2012. The top export partners in 2013 (by net weight) were the United Kingdom (58.7%), Belgium (18.4%), Denmark (6.7%), Netherlands (6.1%) and Italy (5.2%). There was also a sharp increase in exports to the Republic of Korea in 2013, to 34,100 tonnes, up from 25,600 tonnes in 2012. The value of wood pellet exports from the US exceeded $374.2 million in 2013 (UN Comtrade, 2014).

9.5 POLICY AND REGULATORY INFLUENCES

Regulatory actions may affect the type and amount of wood energy consumed. The US Environmental Protection Agency (EPA), for example, has proposed new performance standards for residential wood heaters (US EPA, 2014a). New standards would reduce emissions of fine-particle pollution from woodstoves, pellet stoves, hydronic heaters (boilers) and forced air furnaces by an estimated 4,825 tonnes a year, which would be an 80% reduction compared with estimated emissions without the standards. The proposal is to phase in emission limits over a five-year period, beginning in 2015 and applying only to new wood heaters (Table 9.5.1). According to Dungate (2014), over 90% of the US wood-heating equipment market is based on pellet stoves, of which about 845,000 are in use, with average annual sales of 50,000-60,000 units per year..

TABLE 9.5.1

Emission limits for new wood and pellet stoves proposed by the US Environmental Protection Agency

Regulatory step	*Proposed particle matter limit*	*Compliance deadline*
Step 1: For all stoves without current US EPA certification	4.5 g per hour of operation for catalytic and non-catalytic stoves	60 days after final rule is published in the Federal Register
Step 2: All wood and pellet stoves	1.3 g per hour of operation for catalytic and non-catalytic stoves	5 years after the effective date of the final rule

Source: US EPA, 2014a.

Moreover, the US EPA (2014b) has proposed a Clean Power Plan aimed at cutting electricity-sector carbon pollution by 30% compared with 2005 levels by 2030. It also plans to cut soot and smog pollution by more than 25% over the same period. This action relies on plans by individual states to meet proposed targets. The US EPA is assessing the net atmospheric contribution of biomass-derived fuels in order to assist individual states in complying with emission guidelines (US EPA, 2014c). The Biomass Power Association has expressed support for the Clean Power Plan because it has the potential to strengthen the role of biomass in power generation (Voegele, 2014a). A final ruling is expected by June 2015.

The European Commission plans to address concerns over biomass sustainability after the new climate and energy policy framework is finalized for the post-2020 period. Meanwhile, voluntary initiatives to prove the sustainability of biomass are being developed. The Sustainable Biomass Partnership (2014), a coalition of seven European power companies, is drafting standards that would allow companies to demonstrate compliance with legal, regulatory and sustainability requirements for woody biomass. To prevent duplication, the Sustainable Biomass Partnership aims to incorporate existing mechanisms, such as forest certification, in its standards.

In Europe, Bulgaria, Estonia and Sweden have already reached their 2020 renewable energy goals. On the other hand, the Benelux countries and the United Kingdom face huge challenges in meeting their 2020 renewable energy commitments, and these are the leading countries in industrial wood pellet imports for electricity generation. The European Commission is considering sanctions on countries lagging behind in meeting established renewable energy targets (Battista, 2014).

In the Russian Federation, a federal plan issued in May 2013 on "measures to create favourable conditions for the use of renewable wood resources for the production of heat and electricity" gives priority to developing the use of wood energy. The plan consists of 12 activities to boost the sector, including investigating best practices worldwide, the development of legislation on municipal heating, forest management, and regional support for the wood energy sector. The plan allows preferential interest rates for renewable energy projects and prohibits the construction of boiler houses and power plants using fossil fuels in remote regions with a good supply of wood (Ministry of Natural Resources and Environment of the Russian Federation, 2013). In 2014, the Russian Ministry of Natural Resources and Environment is expected to select ten pilot provinces to develop programmes for a systematic increase in bioenergy (Lesindustry, 2014).

Source: Vapo, 2013.

9.6 INNOVATION IN THE SECTOR

The commercialization of cellulosic biofuels remains one of the most anticipated developments in the wood energy sector, but economic feasibility is elusive. For example, KiOR, the company that built the first commercial-scale cellulosic fuel facility (in Mississippi, US), starting production in 2012, is under major financial strain. In the company's annual report issued in March 2014, KiOR expressed doubt in its ability to continue operations and noted that the company required additional capital to avoid filing for bankruptcy. KiOR developed technology to convert biomass into cellulosic gasoline and diesel fuel (Voegele, 2014b). KiOR is listed in the NASDAQ Stock Market Exchange; on 19 May 2014 it was trading at $0.55 per share, compared with $4.76 per share on 20 May 2013 (NASDAQ, 2014).

Austria has shown that new standards for emissions from residential heaters can drive technological innovation in the wood energy sector (Egger et al., 2014). Over the last 30 years, the average efficiency of biomass boilers in that country has increased from roughly 55% to more than 90% (based on net calorific value), and average carbon monoxide emissions have decreased from 15,000 mg/m^3 to less than 50 mg/m^3 (at 13% O2).

Technological progress in the development of torrefaction (mild thermal treatment of biomass or raw material containing biomass under low-oxygen conditions) (UNECE 2013) as a commercial technology continued in 2013. A successful co-firing experiment, in which up to 25% of coal was replaced with torrefied pellets, was completed at the Amer power plant in the Netherlands, using 2,500 tonnes of torrefied pellets from Topell Energy (Topell Energy, 2013). An ISO standard for torrefied biomass is expected in 2014. Some commentators expect torrefied fuels to penetrate commercial markets in the next few years (IEA Bioenergy Task 40, 2014).

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10 VALUE-ADDED WOOD PRODUCTS

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HIGHLIGHTS

- Markets for value-added wood products continue to recover slowly; consumption is growing in the US, but some European markets remain flat.
- The implementation of the Lacey Act continues, and US hardwood-flooring sellers are under scrutiny after an environmental activist's report accused a company of knowingly supporting illegal logging in the Russian Far East.
- Furniture consumption estimates for the US have been revised upward in light of an improvement in the housing market; European consumption remains stagnant.
- Window frames in Europe are showing sharp trade differences – the locally manufactured wooden frames favoured in Nordic countries are being exported to Asia, the metal frames preferred by southern European consumers are mainly imported from China.
- Profiled wood markets are gaining strength in the US, with Brazil and Chile the leading suppliers of imported softwood mouldings to the US.
- The global production of laminate flooring increased from 890 million m^2 in 2012 to 925 million m^2 in 2013, with China producing 28% of the volume in 2012 replacing Germany as the world's largest producer of laminate flooring.
- Engineered wood products, notably glulam and laminated veneer lumber, are being produced from beech. This is a welcome development in the quest for new markets and uses for beech, which had been losing favour in the market place.
- Markets for most engineered wood products in Europe are stagnant and there is an oversupply; while production and consumption in North America are growing incrementally (although they remain well below pre-recession levels).
- A bright spot in Europe is cross-laminated timber (CLT) consumption, which is expected to grow by more than 10% per year for the foreseeable future.
- CLT is manufactured at three plants in North America, with plans for more plants. Currently, the primary applications for CLT in this subregion are in the mining and oilfield industries (as platforms and matting) and for constructing larger public buildings.
- Building codes are increasingly incorporating engineered wood products and their structural design values enable them to compete with concrete and steel in the construction of tall and large buildings; wood is well positioned to outcompete concrete and steel on the basis of its sustainability.

10.1 INTRODUCTION

Value-added wood products (VAWPs, sometimes also called secondary processed wood products) are wood products that have been further processed into furniture, builders' joinery and carpentry products, profiled wood, and engineered wood products. VAWPs include I-beams (also called I-joists), with their I-shaped cross-sections, finger-jointed sawnwood, glulam ("glued laminated timber" made of sawnwood glued into beams), and laminated veneer lumber (LVL), which is formed by gluing together sheets of veneer and then resawing to desired dimensions. Cross-laminated timber (CLT) is a new addition to this chapter; it is now more than an innovative product and has moved solidly into the mainstream.

Engineered wood products have made inroads into areas where concrete and steel formerly held exclusive use. Builders of bridges and large buildings (such as apartment complexes and sports venues), for example, are now considering wood for its natural beauty as well as its utility, cost-effectiveness and environmental credentials.

10.1.1 Trade policy issues

The US Lacey Act requires that many imported wood and forest products be accompanied by import declarations insuring that they are from a legal source and that due diligence is done to ensure that traded goods are not "tainted", by businesses that source and sell wood and wood products. In September 2013, offices of a leading US based distributor of hardwood flooring were raided, based on allegations of links to illegal logging activities. In reaction to the raid, several lawsuits were filed, alleging the sale of products sourced from endangered habitats. The case is pending and the company has commented that it has policies and procedures in place for the sourcing, harvesting and manufacture of its products designed to comply with federal and other regulations related to the importation of wood-flooring products (Wood Working Network, 2013).

The European Bank for Reconstruction and Development engaged FAO and Indufor in 2013 to conduct a comprehensive study of the forest sector in the Russian Far East (EBRD, 2014). The study concluded that the main advantages for forest industry investors in the Russian Far East include high quality of sawlogs, availability of processing by-products at low cost, and access to fast-growing Asian markets. By-products of solid wood processing operations are increasing in the region, making them an untapped low-cost raw material reserve. China's wood product demand will continue to grow and export potential for timber products, in particular for larch logs to Japan and Korea, is forecast to increase. The most limiting factors for realizing investments include poor basic infrastructure, unstable business climate, failures in long-term planning, shortage of qualified workers, as well as illegal log exports, which has led to resource constraints in some parts of the region (FAO, 2013).

10.2 FURNITURE

10.2.1 Furniture imports

The value of global furniture production, most of which is wooden, reached $437 billion in 2013 according to the latest estimate (CSIL, 2014a). China was by far the largest furniture manufacturing country in 2013, followed by the US, Italy and Germany. The value of the furniture trade was $124 billion in 2013, and the largest furniture importers were the US, Germany, the UK and France. *The World Furniture Outlook* (CSIL, 2014a) expected the global furniture trade to increase to $128 billion in 2014, growing by 5% in Asia and the Pacific but remaining stagnant in Western Europe. Africa is a rising consumer and producer of furniture.

Furniture trade continues to grow faster than consumption as manufacturing moves to lower-cost countries. Another notable trend is the rapid increase of furniture consumption in the emerging-market countries. Global furniture manufacturing companies have already positioned themselves well to serve this growing segment. Emerging-market consumers do not necessarily follow the same trends and consumption patterns as consumers in mature markets, and companies need to keep abreast of specific market trends in these countries.

Consumer spending on new furniture in the US has increased swiftly and forecasts have been revised upward. Spending in 2013 was estimated initially at $87.8 billion and revised to $94.9 billion, and the latest estimate for 2014 is $98 billion (French, 2014). Furniture Today´s five-year forecast indicates that consumer spending on furniture will reach $110 billion by 2018, which would be an annual growth rate of 2.4% (French, 2014). The forecast for Western Europe stands at only 0.5% annual growth (CSIL, 2014a).

The value of furniture imported into the US (by far the world's largest furniture-importing country) amounted to $14.3 billion in 2013, which was lower than in 2012. Furniture imports were worth $5.9 billion in Germany in 2013 and $4.0 billion in each of France and the United Kingdom. US imports are recovering from a low in 2009 but are still far below pre-global financial crisis levels. European furniture import markets are stagnant, with the French market contracting in 2013. Furniture markets are characteristically volatile and closely follow trends in new housing construction and remodelling (graph 10.2.1 and table 10.2.1).

TABLE 10.2.1

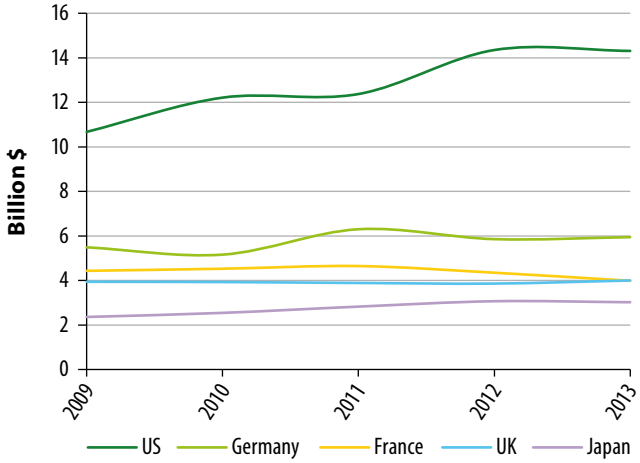
Furniture imports for the top five importing countries, 2012-2013

	(Values in billion dollars and market shares in percentage)									
	US		*Germany*		*France*		*UK*		*Japan*	
	2012	*2013*	*2012*	*2013*	*2012*	*2013*	*2012*	*2013*	*2012*	*2013*
Total value of imports	14.4	14.3	6.0	5.9	4.4	4.0	4.0	4.0	3.1	3.0
Of which furniture parts	1.9	2.1	1.3	1.3	0.8	0.7	0.7	0.8	0.6	0.6
Origin by (%)										
Asia	74.6	75.3	17.7	16.1	23.0	20.3	51.5	47.7	89.1	88.1
North America	9.9	8.1	0.2	0.2	0.4	0.3	1.0	0.9	0.9	0.7
Europe	9.3	11.1	81.7	83.3	75.4	78.4	45.5	49.2	9.9	11.0
Latin America	6.0	5.5	0.3	0.2	0.7	0.6	1.8	2.0	0.0	0.1
Others	0.2	0.1	0.2	0.1	0.5	0.4	0.3	0.3	0.0	0.1

Sources: Eurostat, 2014; Trade Statistics of Japan, 2014; US International Trade Commission, 2014.

GRAPH 10.2.1

Furniture imports, top five importing countries, 2009-2013



Sources: Eurostat, 2014; Trade Statistics of Japan, 2014; US International Trade Commission, 2014.

10.3 BUILDERS' JOINERY, CARPENTRY AND PROFILED WOOD MARKETS

In 2013, markets for builders´ joinery and carpentry continued to recover in the US, the UK and Germany and to decline in France. These markets are characteristically regional, with most imports originating close-by. The exception is the US market, which Asian producers have penetrated strongly (table 10.3.1 and graph 10.3.1).

There are strong differences in Europe between the preferred materials for window-frame manufacturing, with Nordic countries favouring wood (mainly produced in Europe), and southern European consumers preferring metal (typically produced in China). China is the largest importer of wooden window frames made in Europe (CSIL, 2014b). The largest European exporters of wooden-window frames are Germany, Poland and Denmark.

TABLE 10.3.1

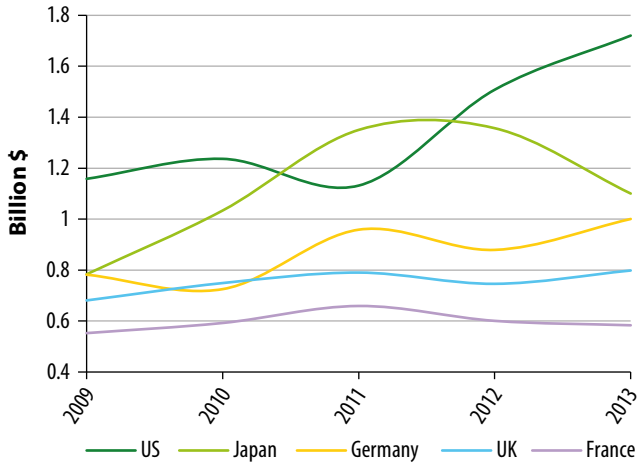
Builders' joinery and carpentry imports for the top five importing countries, 2012-2013

	(values in billion dollars and market shares in percentage)									
	US		*Germany*		*France*		*UK*		*Japan*	
	2012	*2013*	*2012*	*2013*	*2012*	*2013*	*2012*	*2013*	*2012*	*2013*
Total value of imports	1.5	1.7	0.9	1.0	0.6	0.6	0.8	0.8	1.4	1.1
Origin by (%)										
Asia	33.9	35.0	11.7	9.1	13.0	10.0	34.1	34.4	69.0	88.8
North America	47.4	46.8	0.2	0.2	0.8	0.7	2.1	1.8	2.6	3.0
Europe	4.6	4.0	87.4	90.4	83.3	87.1	59.4	59.5	24.5	5.5
Latin America	13.9	13.9	0.0	0.0	2.1	1.3	3.0	2.8	0.0	0.0
Others	0.2	0.2	0.6	0.4	0.9	1.0	1.4	1.5	3.9	2.6

Sources: Eurostat, 2014; Trade Statistics of Japan, 2014; US International Trade Commission, 2014.

GRAPH 10.3.1

Builders' joinery and carpentry imports, top five importing countries, 2009-2013



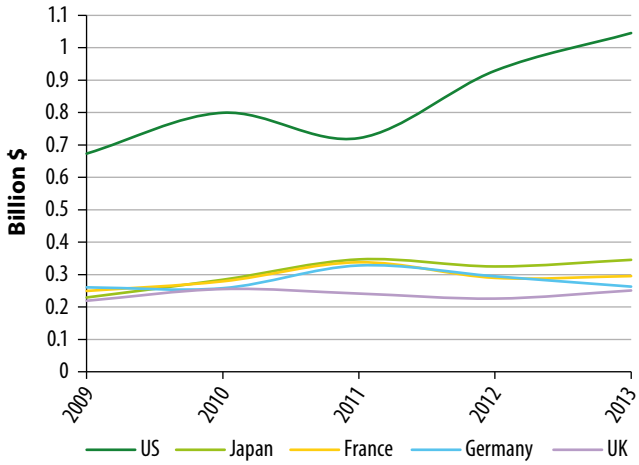
Sources: Eurostat, 2014; Trade Statistics of Japan, 2014; US International Trade Commission, 2014.

The profiled-wood market continues to recover in the US, fuelled by strengthening housing markets. Imports of profiled wood are growing steadily, with Brazil the largest exporter in the softwood mouldings market (36% of market share), followed by Chile (31%) and Canada (11%).

European profiled-wood markets continue to stagnate. These markets are relatively internal to Europe, with few imports from other regions (graph 10.3.2 and table 10.3.2).

GRAPH 10.3.2

Profiled wood imports, top five importing countries, 2009-2013



Sources: Eurostat, 2014; Trade Statistics of Japan, 2014; US International Trade Commission, 2014.

10.4 WOOD LAMINATED FLOORING

Global laminate flooring production increased from 890 million m^2 in 2012 to 925 million m^2 in 2013. China produced 28% of global laminate flooring in 2012, replacing Germany (27% in 2012) as the main producer of this product; Germany's share declined further to 26% in 2013 (graph 10.4.1). The production of laminate flooring in North America was relatively stable in the six years leading up to and including 2013, at about 80 million m^2. North American imports grew from 46 million m^2 in 2008 to 60 million m^2 in 2013. (EPLF, 2014; Munksjö, 2014)

TABLE 10.3.2

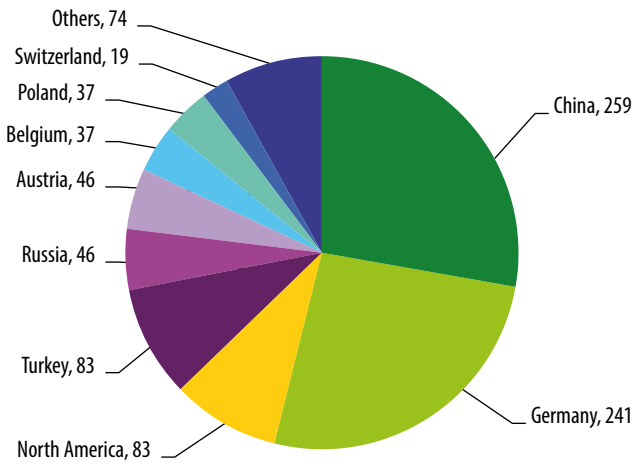
Profiled wood imports for the top five importing countries, 2012-2013

	(values in billion dollars and market shares in percentage)									
	United States		*Germany*		*France*		*UK*		*Japan*	
	2012	*2013*	*2012*	*2013*	*2012*	*2013*	*2012*	*2013*	*2012*	*2013*
Total value of imports	0.9	1.0	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3
Origin by (%)										
Asia	22.6	20.8	24.9	20.5	15.3	10.6	58.9	59.3	82.8	77.7
North America	9.9	10.1	1.2	1.4	0.3	0.2	2.9	3.7	7.5	7.2
Europe	2.6	2.0	64.8	71.4	59.4	69.4	36.3	35.9	4.6	9.5
Latin America	62.8	66.7	6.3	4.0	23.8	18.6	1.7	1.0	4.4	4.3
Others	2.1	0.4	2.8	2.6	1.3	1.2	0.3	0.1	0.7	1.3

Sources: Eurostat 2014; Trade Statistics of Japan, 2014; US International Trade Commission, 2014.

GRAPH 10.4.1

World production of laminate flooring, 2013 (million m²)



Note: World production in 2013 was 925 million m².
Source: Munksjö, 2014.

Western European core markets declined slightly in 2013. Sales in Germany, the largest market in Europe, have declined since the global financial crisis. The biggest increase in laminate flooring sales in 2013 was in Eastern Europe, led by Poland and the Russian Federation (the two largest markets in that subregion). The Russian market has been forecast to grow by up to 5% per year for the next few years (EPLF, 2014; Munksjö, 2014). Exports from Europe to Asia also increased, but Europe's share of total exports to that region remains much lower than before the global financial crisis.

Laminate flooring represented 4% (156 million m²) of the Chinese flooring market in 2011, the total volume of which was 3.9 billion m². The market share of wooden flooring has increased steadily in China during recent years. Exports of laminate flooring from Europe to China collapsed several years ago due to increased domestic production but in 2012 the exports of high-quality laminate flooring from Europe to China increased from 2.3 million m² (2011) to 3 million m² (EPLF, 2013).

10.5 ENGINEERED WOOD PRODUCTS

Demand for engineered wood products depends heavily on residential construction (new and, just as importantly, repairs and renovations) and increasingly on non-residential building construction, such as schools, restaurants, stores and warehouses.

10.5.1 Europe

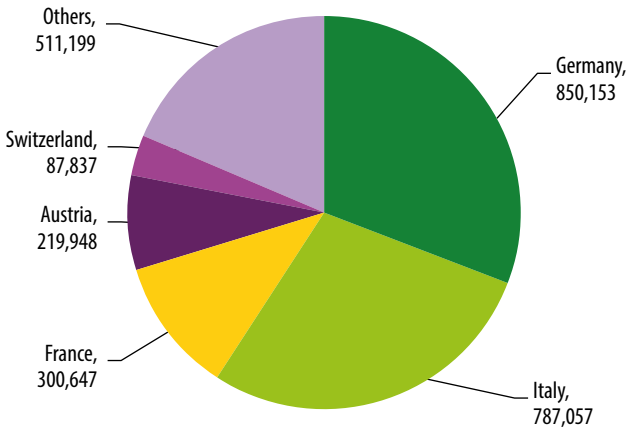
10.5.1.1 Glulam

Glulam is the largest segment of the engineered wood products market in Europe. Producers in Europe focus primarily on their regional markets – the only exception being sales to Japan. While Germany and Austria have traditionally been the key markets for glulam, the rise in consumption of engineered wood products in Italy is notable (graphs 10.5.1 and 10.5.2).

Source: proHolz, 2013.

GRAPH 10.5.1

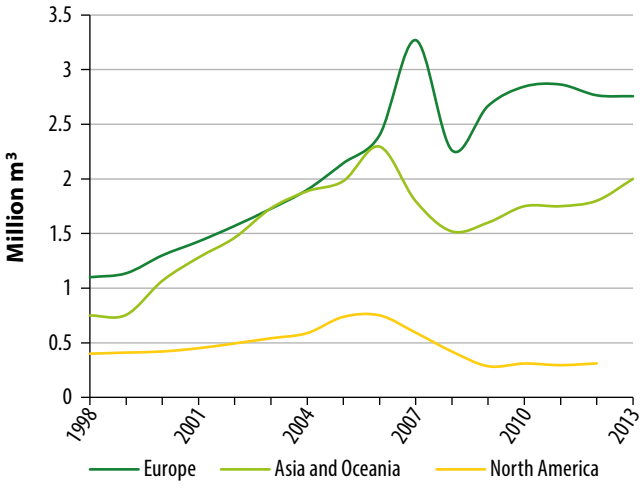
Consumption of glulam products in Europe, 2013 (m³)



Sources: EUWID, 2011, 2012; Holzkurier, 2011, 2012a; Timber Online, 2013b; Studiengemeinschaft Holzleimbau, 2012; Pöyry, 2012, 2013; Suomen Liimapuuyhdistys, 2014.

GRAPH 10.5.2

Global consumption of glulam products, 1998-2013



Sources: APA, 2014; EUWID, 2011, 2012; Holzkurier, 2011, 2012a; Timber Online, 2013b; Studiengemeinschaft Holzleimbau, 2012; Pöyry, 2012, 2013; Suomen Liimapuuyhdistys, 2013.

Source: APA, 2014.

The production of glulam in Austria and Germany stagnated in 2012 and 2013 at about 2.84 million m^3, but some analysts expect it to increase in 2014 due to more favourable market conditions (i.e. an early start to the building season and an expected improved economic outlook) (Timber Online, 2014a, 2014d). There are many examples of new investments[23] that aim to add capacity and increase production flexibility (Timber Online, 2013c). Austria exported 5.4% more glulam (1.23 million m^3 of glulam and CLT combined) in 2013 than in 2012. Germany, Switzerland, France and the United Kingdom were the major destinations (Timber Online, 2014b).

Finland produced 302,000 m^3 of glulam in 2012, 9% less than in 2011. Production increased slightly in 2013, to 309,500 m^3. Finnish exports to the rest of Europe (mainly France, the United Kingdom and Italy) continued to decline however, falling by 21% to 36,400 m^3 in 2013 (Suomen Liimapuuyhdistys, 2013).

Exports from Austria and Finland to Japan decreased in the first half of 2013 due to unfavourable currency exchange rates. This followed a decline in exports to Japan of 7.9% from Austria and 5% from Finland in 2012 (Holzkurier, 2013b; Suomen Liimapuuyhdistys, 2013). Interestingly, Estonian exports to Japan increased by 28% in 2013 (Timber Online, 2013d).

In Finland, Keitele Timber and Tuovinen have jointly invested in a new sawmill and a new glulam production facility (Lappi Timber Oy), the latter with a capacity of 70,000 m^3, producing primarily for the Japanese market (Timber Online, 2013c).

10.5.1.2 Laminated veneer lumber

Several products compete with glulam, including laminated veneer lumber (LVL), which has gained importance in northern Europe. Pollmeier (Germany) commenced production of beech LVL in 2014 and plans to produce 150,000–180,000 m^3 of this product per year. Beech LVL is expected to have considerable physical and technical advantages over beech glulam and spruce glulam (e.g. up to 53% greater bending strength) (Timber Online, 2013a). The price of beech LVL should be in the range of €520–750/m^3 (at site), depending on quality. This could be an important option for additional value added from beech, given unsatisfactory markets/prices for beech sawnwood and roundwood.

10.5.1.3 Wooden I-beams

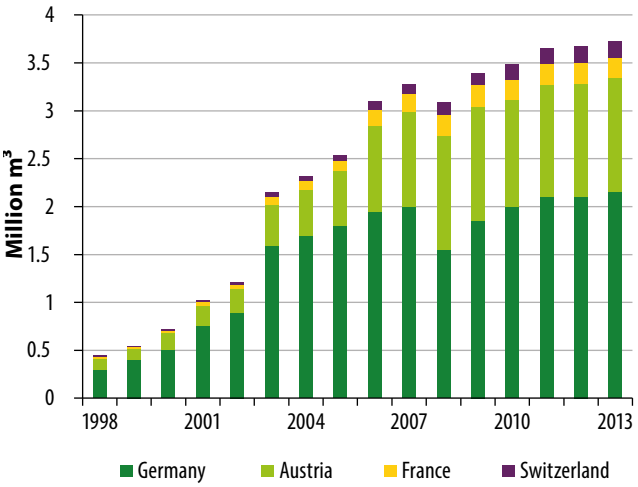
The United Kingdom construction sector uses wooden I-beams much more than glulam, and the United Kingdom is the largest market in Europe for this product. Currently, however, few data are available on wooden I-beam production and consumption in Europe. It is hoped that future editions of the Forest Products Annual Market Review can rectify this lack of data.

10.5.1.4 Finger-jointed structural timber

Finger-jointed structural timber has a significant share of the market in Central Europe. Production is mainly located in Austria, Germany and, to a lesser extent, the Czech Republic. The highest demand is in the German domestic market (graph 10.5.3).

GRAPH 10.5.3

Consumption of finger-jointed structural timber products in four European countries, 1998-2013



Sources: EUWID, 2011, 2012; Holzkurier, 2012b; Pöyry, 2012, 2013.

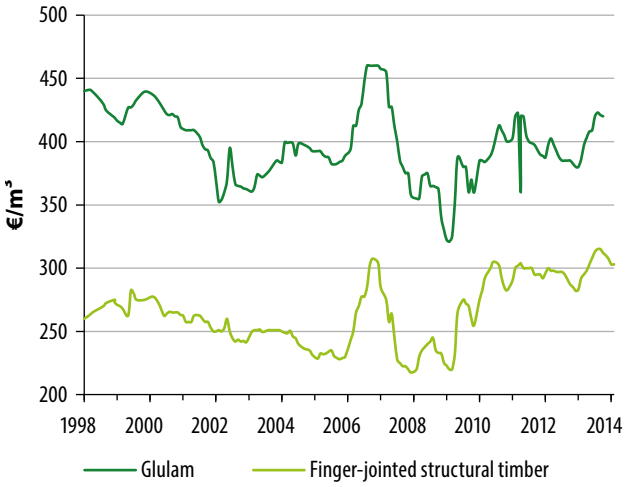
[23] Bullinger, Neuruppin, Germany; Josef Ziegler, Plößberg-Stein, Germany; and Schaffitzel Holzindustrie, Schwäbisch-Hall, Germany.

The production of finger-jointed structural timber in Austria and Germany grew by 1.2% in 2013 (to 2.62 million m^3), considerably lower than the 3.5% forecast (Holzkurier, 2013a). Production is forecast to increase by 5.4% (to 2.77 million m^3) in 2014 compared with 2013 as a result of the rising housing market in Germany combined with an early start to the construction season because of a mild spring (Timber Online, 2014c).

A comparison of the prices of glulam with finger-jointed structural timber shows that glulam prices were recently about €420/m^3 and finger-jointed structural timber prices about €315/m^3. In the period 1998 to 2013, the price differential between the two products ranged from a high of €180/m^3 to a low of €52/m^3 (graph 10.5.4).

GRAPH 10.5.4

Nominal prices for glulam and finger-jointed structural timber in Germany, 1998-2013



Note: Prices have not been adjusted for inflation.
Sources: EUWID, 2011, 2012; Timber Online, 2013e, 2014e.

10.5.1.5 Cross-laminated timber

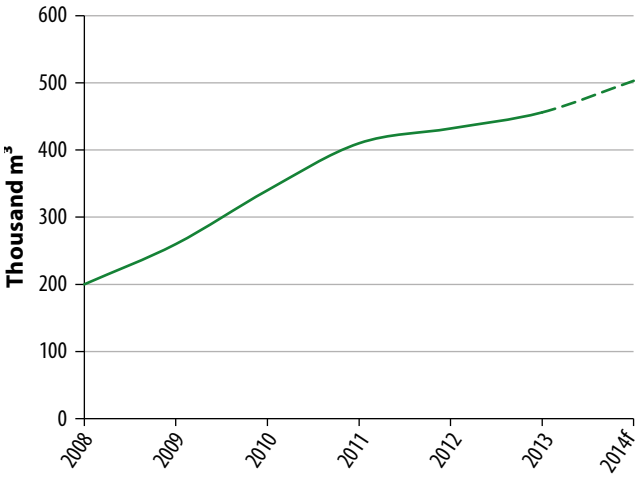
CLT consists of several (usually 3–7) layers of cross-glued boards, with the grain in the outer layers oriented along the length of the product.

Until recently, the producers of CLT building systems were unable to compete with steel and concrete for high-rise building applications because the majority of regulations and codes did not allow wood as a structural material. Building codes are now evolving in Europe in favour of wood. Some of the most important European Committee for Standardization (CEN) standards for construction are undergoing a five-year review. In 2013, for example, the European Standard (EN) 1995 "Design of timber structures" (Eurocode 5) was updated. CLT is no longer a niche product and is therefore being addressed specifically by the review. Nine workgroups for future development have been established and will be looking into, for example, the use of CLT in the event of fire (not currently dealt with by EN 1995-1-2) and the reinforcement of CLT elements (rolling shear).

About 550,000 m^3 of CLT was produced in central Europe in 2013. Of this total, 90% (505,500 m^3) was produced in the DACH countries (Germany, Austria and Switzerland) and many manufacturers are export-oriented. Of the total CLT production in DACH countries, 449,500 m^3 was glued and 56,000 m^3 was dowelled. Growth in 2013 was significant (as high as 20%, depending on the country), with Austria leading growth and production. Hasslacher Norica Timber (based in Sachsenburg, Austria) modernized its production process for CLT and also planned to add hardwood CLT to the product mix in the summer of 2014 (Timber Online, 2014c). Austria produced 335,000 m^3 of glued CLT in 2013, Germany 101,500 m^3 and Switzerland 13,000 m^3 (graphs 10.5.5 and 10.5.6).

GRAPH 10.5.5

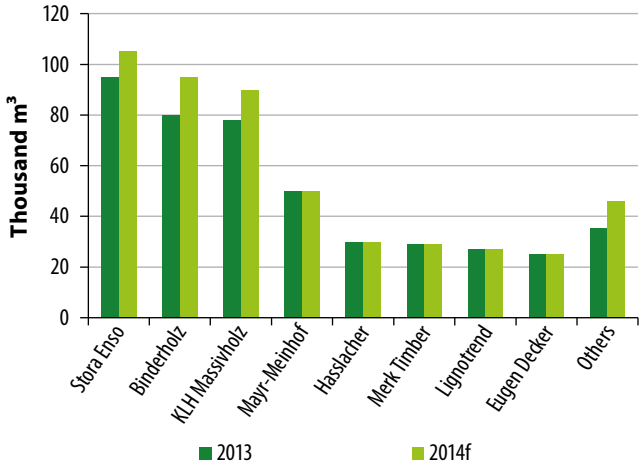
Production of glued CLT in DACH countries and the Czech Republic, 2008-2014



Notes: f = forecast. DACH countries are Germany, Austria and Switzerland. The Czech Republic accounted for 6,000 m^3 of the total annual production shown.
Source: Timber Online, 2014f

GRAPH 10.5.6

Glued-CLT producers in DACH countries, 2013-2014



Notes: f = forecast. The DACH countries are Germany, Austria and Switzerland.
Source: Timber Online, 2014f

The main markets for CLT are Germany, Austria, Switzerland, the United Kingdom and Italy. These five countries consume an estimated 70% of European production. The United Kingdom imports CLT from a number of European countries, with Austria accounting for the majority of the supply.

Italian building regulations have favoured the use of wood since 2009 (perhaps partly in response to the L'Aquila earthquake in that year). Another feature of construction in Italy (and many other Western European countries) is a focus on urbanized environments in which multi-storey apartment buildings are the norm. An example of this focus is the construction of the nine-storey residential complex "Via Cenni" in Milan, which used 6,100 m^3 of CLT obtained from Stora Enso in Austria.

Source: proHolz, 2013.

On 27 February 2014, the Municipality of Milan signed a cooperation agreement with the Italian Federation of the Wood Industry (Federlegno Arredo) to ensure that the public building sector supports the construction of wooden buildings.

According to producers (E. Schilliger, personal communication, 2014), France was a growing market for CLT in 2013. It is a difficult market to enter, however, because of liability requirements.

The use of CLT products and buildings featuring CLT are increasing in Nordic countries. A Finnish company called Oy CrossLam Kuhmo Ltd will soon open its first CLT factory. In Norway, Massiv Lust AS began producing 1.2 meter width CLT panels in 2013. The only company producing CLT for the market in Sweden is Martinsons Byggsystem KB, which is a major producer of multi-storey buildings in Sweden, at about 20,000 m^2 per year. There are also companies in Sweden using imported CLT elements.

The annual growth rate of CLT consumption in Europe is expected to be continue well above 10% for the foreseeable future. CLT has the potential to gain further market share, especially in multi-storey residential buildings. The DACH countries will provide the main market, but markets in France, Italy and the United Kingdom could also develop further and the Nordic subregion is catching up in the manufacture and use of CLT.

10.5.2 North America

Engineered wood products in North America have recovered modestly since the bottoming out of building construction activity in 2009. The information presented in this section on the use of engineered wood products in the region was obtained from reports on new residential construction and repair and remodelling in North America published by the APA (2014) and the Wood Products Council (2009).

10.5.2.1 Glulam

Overall production of North American glulam declined dramatically from 750,000 m^3 in 2006 to 285,000 m^3 in 2009, recovering thereafter to a forecast 408,000 m^3 in 2014 (table 10.5.1 and graph 10.5.7). Half of North American glulam production in 2013 was used for new residential construction and remodelling; non-residential construction accounted for 37% and industrial and other uses for 13%.

TABLE 10.5.1

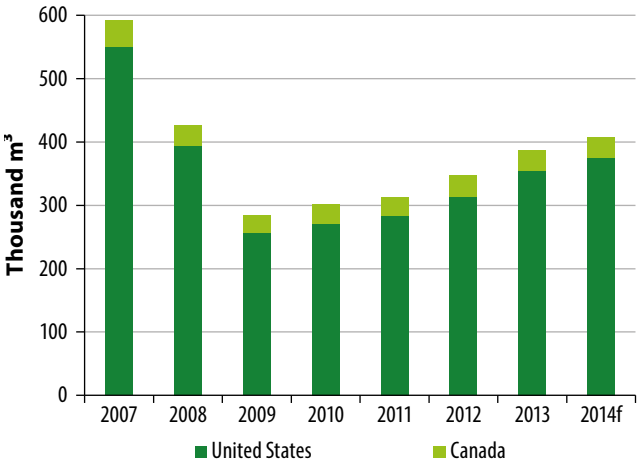
Glulam consumption, production and trade in North America, 2012-2014

	(1,000 m³)			
	2012	2013	2014f	Change (%) 2012-2013
United States				
Production	313.8	353.8	375.4	12.7
Consumption				
Residential	138.5	178.5	204.6	28.9
Nonresidential	132.3	129.2	136.9	-2.3
Industrial, other	20.0	21.5	21.5	7.5
Total consumption	290.8	329.2	363.1	13.2
Inventory change	23.1	24.6	12.3	6.5
Canada				
Production	33.8	32.3	32.3	-4.4
North America				
Total production	347.7	386.2	407.7	11.1

Notes: f = forecast. Conversion factor: 1 m³ = 650 board feet. Canadian imports are assumed to be minimal.
Source: APA, 2014.

GRAPH 10.5.7

Glulam production in North America, 2007-2014



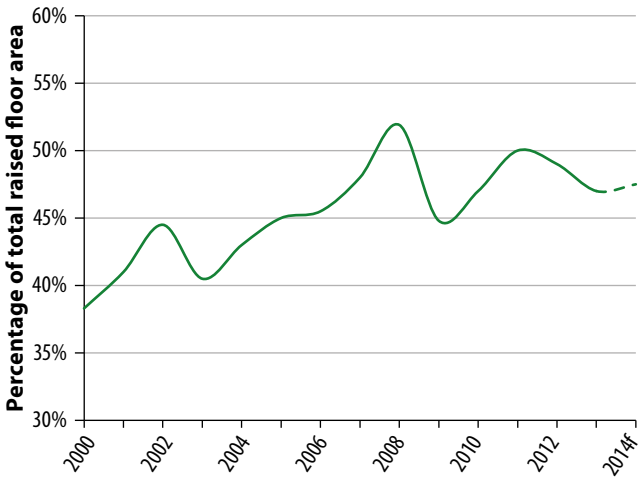
Notes: f = forecast. Conversion factor: 1 m³ = 650 board feet.
Source: APA, 2014.

10.5.2.2 Wooden I-beams

More than 90% of wooden I-beams are used for new home construction, mostly single-family units, with the remainder used in non-residential building construction and for repairs and remodelling. Builder surveys indicate that the I-beam share of raised-wood floor area (which does not include concrete floor area) has been relatively constant, at about 50%, in the past five years (but it was only 16% in 1992) (graph 10.5.8).

GRAPH 10.5.8

I-beam market share in the US, 2000-2014

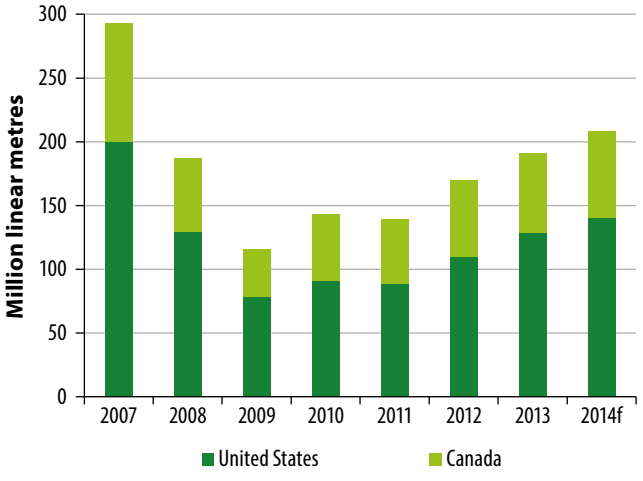


Notes: f = forecast. Wooden I-beam market share of total raised-floor area, single-family homes.
Sources: APA, 2014; NAHB, 2014.

Demand for I-beams peaked in 2005, a level that equated to the practical capacity of I-beam plants at that time. Housing starts were so high that manufacturers produced as much as they could. I-beam demand and production declined, however, when the US housing bubble burst. Roughly 115 million linear metres were produced in 2009 and there have been significant increases since then; the forecast for 2014 was 207.9 million linear metres, an 11% increase over 2009 (graph 10.5.9 and table 10.5.2).

GRAPH 10.5.9

I-beam production in North America, 2007-2014



Notes: f = forecast. Conversion: 1 linear metre = 3.28 linear feet.
Source: APA, 2014.

TABLE 10.5.2

Wooden I-beam consumption and production in North America, 2011-2013

	(million linear metres)			
	2012	2013	2014f	Change (%) 2012-2013
United States				
Production	109.5	128.7	140.2	17.5
Consumption				
New residential	97.9	119.5	139.6	22.1
Repair, remodelling	4.0	4.3	4.9	7.5
Nonresidential/other	10.1	9.1	10.1	-9.9
Total consumption	111.9	132.9	154.6	18.8
Canada				
Production	60.1	62.2	67.7	3.5
Consumption				
New residential	27.1	24.4	24.4	-10.0
Repair, remodelling	4.6	4.3	4.3	-6.5
Nonresidential, other	3.0	3.0	3.0	0.0
Total consumption	34.8	31.7	31.7	-8.9

Notes: f = forecast. Conversion factor: 1 linear metre = 3.28 linear feet.
Source: APA, 2014.

10.5.2.3 Laminated veneer lumber

Most LVL is consumed in new home construction, with 73% used for beam and header applications in 2013 and the balance for I-joist flanges. A small amount is classified as industrial rim boards (but included in the beam and header category). Rim boards are used on the perimeters of I-beam flooring systems to provide fastening points for the I-beams and to assist in load distribution. LVL production peaked in 2005 (at 2.6 million m^3) and declined thereafter to 2009, in parallel with I-beam production and the housing market. North American production was forecast to reach 1,776,000 m^3 in 2014, up by more than 70% from the 2009 trough (graph 10.5.10 and table 10.5.3).

LVL is well accepted for use in beams and headers, and growth should return with an improved housing market. Like other engineered wood products, LVL allows the use of longer spans and fewer pieces to carry the same loads as conventional wood products.

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

TABLE 10.5.3

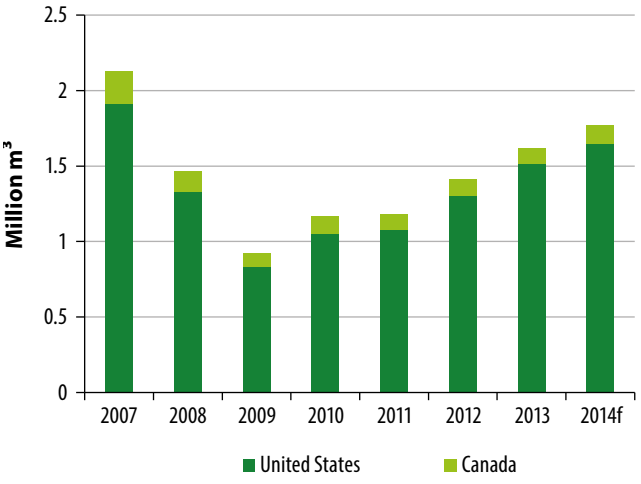
LVL consumption and production in North America, 2012-2014

	(1,000 m^3)			
	2012	2013	2014f	Change (%) 2012-2013
Consumption				
I-beam flanges	371	425	470	14.6
Beams, headers, other	1,042	1,192	1,305	14.4
Total consumption	1,413	1,617	1,776	14.4
Production				
United States	1,305	1,512	1,651	15.9
Canada	108	105	125	-2.8
Total production	1,413	1,617	1,776	14.4

Notes: f = forecast. Conversion factor: 1 m^3 = 35.3147 cubic feet.
Source: APA, 2014.

GRAPH 10.5.10

LVL production in North America, 2007-2014



Notes: f = forecast. Conversion factor: 1 m^3 = 35.3147 cubic feet.
Source: APA, 2014.

Three commercial producers in North America (two in Canada and one in the US) produce significant quantities of CLT for non-residential construction and industrial applications. Industrial applications, such as matting and platforms for the oil and mining industries, are among the biggest uses for CLT.

There is considerable speculation on the future of CLT in North America, where the market differs significantly from Europe because the vast majority of single-family dwellings

and many multi-family dwellings are already constructed of wood using well-developed systems and builders with considerable expertise in wood construction. It is expected that North American production and consumption will increase in coming years, but for the time-being it appears that the primary applications continue to be in industry, in larger public buildings and perhaps custom homes (where the market for architectural freedom and uniqueness is high).

Another potential trend emerging in Canada is tall wooden structures – that is, buildings that are taller than the six-storey wooden-framed buildings (mostly multi-family residential) now being built in parts of Canada. As a showcase example, construction has started on what is being called North America's tallest wooden building, the Wood Innovation and Design Centre in Prince George, British Columbia, Canada. This $25 million project will be 27.5m (90 feet) in height (the equivalent of a nine-storey building). Vancouver architect Michael Green is rapidly becoming an ambassador for tall wooden buildings, with dreams of 20-30-storey high-rises built of wood in the not-too-distant future. Green's concept for tall buildings was featured in the December 2012 edition of *National Geographic*. Regardless of whether wooden skyscrapers become a reality, this level of interest shows that architects and engineers are thinking "outside the box" when it comes to the use of wood products and systems, usually because of their desire to promote greener construction.

Source: Naturally Wood, 2014.

Note: The statistical annex of the *Forest Products Annual Market Review 2013-2014* is available at: www.unece.org/forests/fpamr2014-annex.html

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11 HOUSING AND CONSTRUCTION

Lead author: ***Delton Alderman***

HIGHLIGHTS

- OECD economies, in aggregate, have been sluggish; unemployment remains high in several countries, and minimal gross domestic product gains are forecast for the Euro area through 2016.
- Recession, sovereign debt problems and lethargic economies continue to constrain Europe's housing construction market; no improvement is expected before 2015 or 2016; Germany's positive housing market is an exception.
- Housing completions in the Russian Federation achieved record levels in 2013, with a total of 912,100 new dwellings built, an increase of 10.3% over 2012 and the largest number of new dwellings built in a single year for more than 20 years.
- The US housing market was mixed in 2013: there was substantial improvement in the first half of the year but waning sales in the second half. Within this overall picture there was an improved but subdued single-family market; an expanding multi-family market; and decreasing sales of lower-priced houses versus increasing sales of higher-priced houses.
- The annual rate of formation of new US households decreased by about 800,000 between 2009 and 2014; overall, there has been a 59% decline from the 2000–2006 average of 1.35 million per year.
- Investor purchases, a substantial influence in the improvement of housing sales in the US, decreased in the latter half of 2013.
- North American building-material demand and prices increased substantially in early 2013 but declined in the latter half of the year due to a sluggish world economy and a tepid US housing market.
- The economic situation in Canada improved in late 2013 and is expected to continue to improve in 2014 and 2015. Forecasts suggest modest housing demand and starts in Canada in 2014 and 2015.

11.1 A BRIEF ON THE ECONOMIC SITUATION IN THE UNECE REGION IN 2013-2014

In general, the economic condition of a country has a significant effect on its housing and construction markets. For example, housing construction and sales usually increase in more prosperous economic times because people tend to purchase houses. The reverse also is true: in less prosperous economic periods, housing construction and sales usually decline. The International Monetary Fund (IMF) and the World Bank foresee lacklustre economic performances for both the US and the Euro area (also called the Eurozone) in 2014 and 2015. The IMF (2014a) forecast overall growth in gross domestic product (GDP) in the advanced economies[24] of 2.2% in 2014, increasing to 2.3% in 2015. Estimates for the US were somewhat more than this, at 2.3% in 2014 and 3.0% in 2015, and lower for the Euro area, at 1.2% in 2014 and 1.5% in 2015. The outlook is also disappointing for the Organisation for Economic Co-operation and Development (OECD) countries as a whole, with a forecast increase in GDP of 1.5% in 2014 and 1.9% in 2015 (IMF, 2014a). According to the World Bank (2014), "Developing countries are headed for a third consecutive year of disappointing growth below 5% … the Euro area is on target to grow by 1.1% and the US by 1.9% in 2014". Fragile consumer and business confidence, high unemployment in some member countries, continued banking-sector and fiscal restructuring, and lingering sovereign debt problems restrain economic growth in developed and high-income regions such as Europe. The Euro area is still suffering from the after-effects of the 2008 global financial crisis. The US economy appears to be improving slowly, but several of the uncertainties affecting the Euro area, particularly business uncertainty, also are affecting the US.

The prospects for the Russian Federation's economy were downgraded in 2014 (in the wake of the Ukraine crisis and other factors), with the IMF estimating GDP growth at 0.2% in 2014 and 2.3% in 2015 (IMF, 2014b). The World Bank (2014) projected GDP growth in the Russian Federation of 1.1% in 2014 and 2.1% in 2015 on the assumption that the political situation does not worsen.

[24] The IMF list of advanced economies includes: Andorra, Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Faroe Islands•, Finland, France, Germany, Greece, Holy See, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Latvia, Liechtenstein•, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Portugal, San Marino, Singapore, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Taiwan, United Kingdom, United States.

11.2 EUROPEAN CONSTRUCTION MARKET

11.2.1 Review and outlook

In 2010, about 42% of EU27 citizens lived in flats, nearly 34% lived in detached houses, and 23% lived in semi-detached houses. Nearly 28% of the EU27 population lived in owner-occupied homes with outstanding loans or mortgages, while about 43% lived in owner-occupied homes without loans or mortgages (Eurostat, 2014).

Source: proHolz Austria, 2014.

The Euroconstruct[25] region's housing market is mixed. Housing is "strongly influenced by macroeconomic events" (Euroconstruct 2013a), and the forecast is for "slim growth" in 2014 and in the near future (Euroconstruct 2013b). Another potentially adverse factor is demographics: in the future, the aging of the population may have substantial negative consequences for several OECD housing markets because older people are more likely to downsize than to invest in new housing, and fewer young people are projected to form households.

Prospects for the Euroconstruct region's housing markets have therefore been revised downward from previous forecasts. This is illustrated by a change in the countries that lead the Euro area in construction. In the first decade of the current century, the top five construction countries were Germany, France, Italy, Spain, and the UK (Euroconstruct, 2013a). In the 76th Euroconstruct (2013b) report, countries were segmented into six groups, ranging from Group 1 (the highest-rated countries with the best prospects for housing and construction) to Group 6 (countries with the weakest prospects for housing and construction). Austria, Belgium and Germany were in Group 1 and Finland, Norway, Poland and Switzerland were in Group 2; France, Italy, Spain and the UK (all previously among the top five construction countries in the Euro area) were all downgraded into lower groups. Perhaps the most obvious example of the housing crash is Spain. Significant construction occurred in

[25] 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.

Spain in the early 2000s: for example, the country accounted for 20% of all Euro-area housing under construction in that period. In 2014, however, Spain's construction forecast was severely downgraded, and now Spain is in Group 6, along with Ireland and Portugal (Euroconstruct, 2013b).

In 2013, nearly 46% of all construction activities were associated with residential building: new construction accounted for 18% and renovation and maintenance for 28% (Euroconstruct 2014). Allen (2014) reported that construction increased by 8.0% in the Euro area and by 7.2% in the EU28 between April 2013 and April 2014. The gains in both these groupings were due primarily to improvements in the building construction sector, with only a slight increase in the civil-engineering sector.

On a monetary basis, remodelling is the largest expenditure in Euro area construction. In the immediate future, however, new residential construction is forecast to increase more than remodelling in percentage terms. Total new residential construction spending is forecast to increase by an average of 3.2% (inflation adjusted) between 2014 and 2016. In eastern Europe, new construction accounts for about 66% of building activity, compared with just under 33% in western European countries (Euroconstruct 2014).

11.2.2 European construction trends

11.2.2.1 New housing

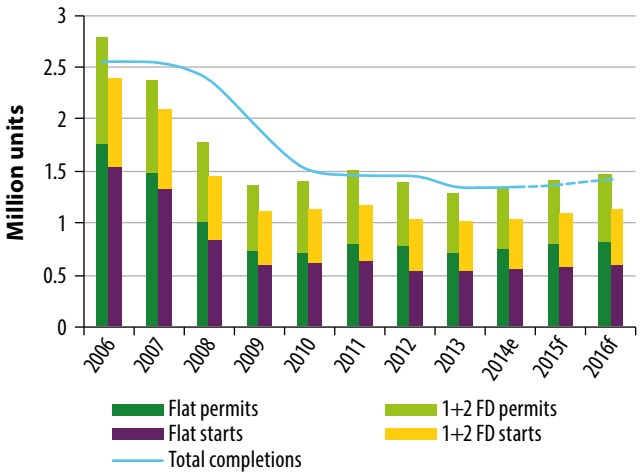
The projected number of new housing permits and starts in 2015 is 1.46 million and 1.14 million units, respectively – nearly the same quantities as in 2010 (Euroconstruct, 2014). A record 2.77 million construction permits for homes were issued in 2006, compared with 1.28 million units in 2013, a 53.8% decrease. Nearly 562,500 flats and 480,000 single and multi-unit structures that also are referred to as 1 + 2 family dwellings (meaning detached or semi-detached) starts are forecast for 2014. Moreover, 631,200 1 + 2 (single and multi-units) and 716,000 flats are projected to be finished in 2014 (graph 11.2.1) (Euroconstruct 2014).

Germany's housing market is an exception to the aggregate building trends in the Euro area. Möbert (2014) projected an improvement in the German housing market through most of 2014, with permits exceeding completions in that year. Germany's issued building permits and completions will approach equivalency in 2015 or 2016 at the earliest.

In Euroconstruct's projection of the top five countries for new construction and remodelling in 2014 (table 11.2.1), Germany ranked first in both categories (Euroconstruct, 2014).

GRAPH 11.2.1

Building permits, housing starts and completions in the Euroconstruct region, 2006-2016



Notes: FD=family dwellings. e=estimate. f=forecast.
Source: Euroconstruct, 2014.

TABLE 11.2.1

Residential new construction and remodelling forecast for top five countries in the Euroconstruct region, 2014-2015

(billion €)					
New construction			*Remodelling*		
Country	*2014*	*2015*	*Country*	*2014*	*2015*
Germany	46.5	48.9	Germany	113.0	113.0
France	41.0	41.8	Italy	66.9	68.0
UK	33.3	36.0	France	53.3	53.6
Switzerland	18.5	18.8	UK	35.7	37.0
Italy	18.0	17.9	Spain	14.8	14.5

Notes: In 2013 prices. Data published in June 2014.
Source: Euroconstruct, 2014.

11.2.2.2 Non-residential buildings and civil engineering

Construction demand in the Euroconstruct region is being depressed by a number of factors, including: government budget reductions (Euroconstruct, 2014); business deleveraging and decreased spending; consumer deleveraging; and the economic climate, including the effects of the global financial crisis.

Non-residential construction comprised nearly 33% of all construction in 2013, and housing and civil engineering accounted for 45% and 22%, respectively. Non-residential construction is predicted to increase by 1.0% in 2014, by a further 1.6% in 2015, and by an additional 1.9% in 2016 (table 11.2.2). Germany, France, the UK, Italy, and Spain (in that order) were the five largest non-residential markets in 2013 (Euroconstruct, 2014).

TABLE 11.2.2

Non-residential construction spending forecast in the Euroconstruct region, 2014-2016

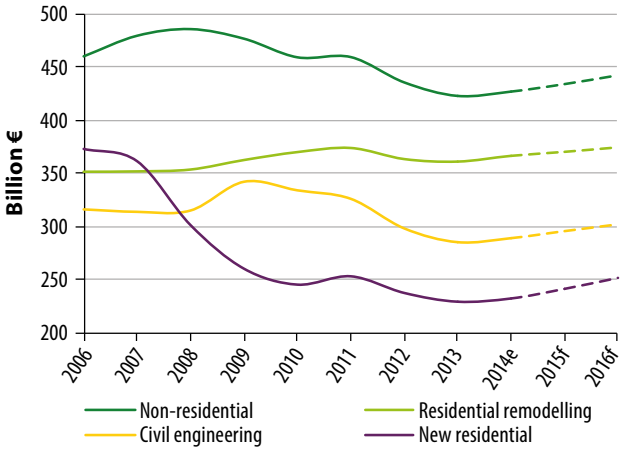
(billion €)			
Year	*New construction*	*Remodelling*	*Total non-residential*
2014	219.1	207.6	426.7
2015	223.3	210.4	433.7
2016	228.2	213.8	442.0

Notes: In 2013 prices. Data published in June 2014.
Source: Euroconstruct, 2014.

Spending projections for new residential and non-residential buildings, civil engineering and residential remodelling illustrate the overall construction malaise in the Europe area (graph 11.2.2). Spending in the educational and miscellaneous non-residential building sectors is forecast to decrease in 2014 because of prevailing economic conditions. Expenditures on warehouse, agricultural, commercial, health and office buildings are forecast to increase, albeit minimally (Euroconstruct, 2014).

GRAPH 11.2.2

European construction spending, 2006-2016



Notes: e=estimate. f=forecast.
Source: Euroconstruct, 2014.

The value of residential construction is forecast to be 1.4% higher in 2014 than in 2013, with gains of 2.1% and 2.4% projected for 2015 and 2016, respectively. Total residential construction in 2014 is forecast to reach a value of €598.4 billion ($797.9 billion), increasing to €625.7 billion ($834.3 billion) in 2016 (table 11.2.3). On average, total new residential construction is forecast to increase by 3.2% (in real terms) between 2014 and 2016, somewhat below the earlier Euroconstruct (2013b) forecast of 3.4%.

Residential remodelling is projected to remain the most important construction activity in the Euro area, increasing from €366.3 billion ($488.3 billion) in 2014 to €374.3 billion ($499.0 billion) in 2016. Housing renovation forecasts are all positive: a 1.5% increase in 2014, a 1.0% increase in 2015 and a 1.1% increase in 2015. Renovation and home repair figures have been steady since the global financial crisis. Historically, home renovation projects have been supported by government programmes (Euroconstruct, 2014).

TABLE 11.2.3

Residential new construction and remodelling spending forecast in the Euroconstruct region, 2014-2016

(billion €)			
Year	*New construction*	*Remodelling*	*Total residential*
2014	232.1	366.3	598.4
2015	241.2	370.0	611.2
2016	251.5	374.3	625.7

Notes: In 2013 prices. Data published in June 2014.
Source: Euroconstruct, 2014.

Civil engineering has declined overall in the Euro area since 2009; output was about 13% less in 2013 than in 2010. Note, however, that public civil-engineering spending varies greatly between countries. Projections for 2016 indicate that civil-engineering spending will surpass that for 2012, increasing by 5.9% over 2013 from €285.1 billion ($380 billion) to €301.8 billion ($402.4 billion) (Euroconstruct, 2014).

11.2.2.3 Construction sector shares and growth: contrasting Western and Eastern Europe

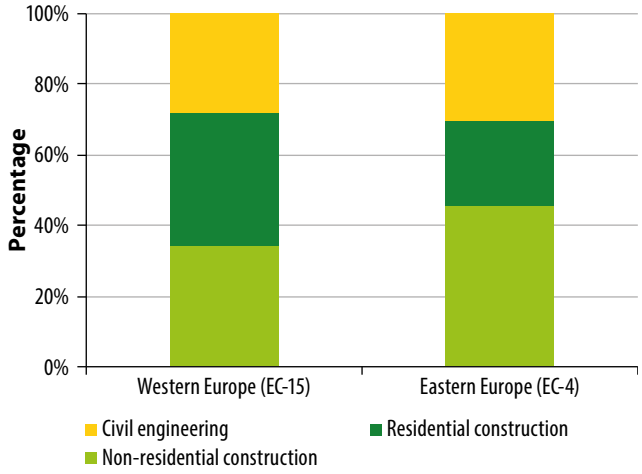
In Euroconstruct's western subregion, total residential construction is predicted to increase from €589.9 billion ($786.5 billion) in 2014 to €625.7 billion ($834.3 billion) in 2016. Euroconstruct's eastern subregion is forecast to increase residential construction from €16.7 billion ($22.3 billion) to €18.2 billion ($24.3 billion) in the same period (Euroconstruct, 2014).

According to Euroconstruct (2014), total construction spending (measured in constant prices) in 2013 was at its lowest level since 1993, at €1.3 trillion ($1.7 trillion). About two-thirds of European construction is forecast to occur in Germany, France, the UK, Italy, and Spain (in order of magnitude) (Euroconstruct 2014).

In Euroconstruct's western subregion, new residential construction is the leading sector in terms of spending, followed closely by new non-residential building (37.6% and 34.2%, respectively). Spending in the eastern subregion comprises about 6% of total Euroconstruct region construction expenditure; there, new civil engineering and new non-residential construction comprise 75.5% of expenditure on new construction (graph 11.2.3) (Euroconstruct, 2014).

GRAPH 11.2.3

Euroconstruct sector shares for new construction, 2013



Source: Euroconstruct, 2014.

11.3 CIS CONSTRUCTION MARKET, WITH FOCUS ON THE RUSSIAN FEDERATION

11.3.1 Housing construction in the Russian Federation , 2013-2014

There were record housing completions in the Russian Federation in 2013. A total of 912,100 new dwellings were built, an increase of 10.3% over the previous year and the largest number of new dwellings for more than 20 years (Sosna, 2014). Residential space construction totalled 69.4 million m^2 in 2013, an increase of 5.6% over 2012.

In the first quarter of 2014, 178,000 apartments were commissioned in the Russian Federation, with a total area of 13.6 million m^2. This is nearly 31% greater than commissioned during the same time-period o 2013, when 10.4 million m^2 was commissioned. In the first quarter of 2014, individual developers built 47,600 residential houses with a total area of 6.4 million m^2, an increase of 19.2% above the total for the same period in 2013 (Russian Federation Federal State Statistics Service, 2014).

11.4 NORTH AMERICAN CONSTRUCTION MARKET

11.4.1 The US housing market

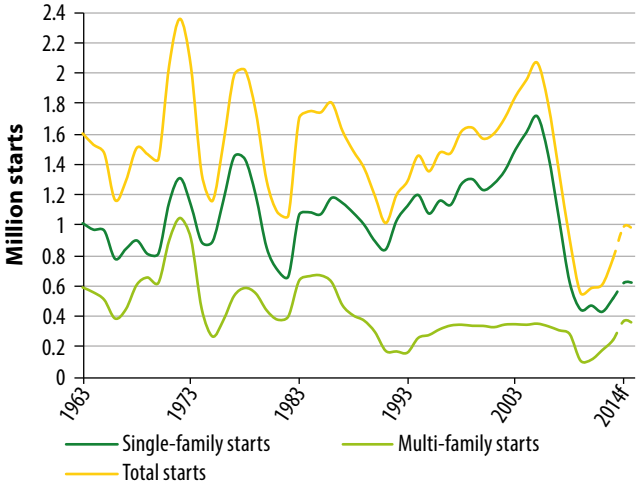
The US housing market experienced modest growth in 2013 – although annual starts were much lower than the 1963-to-2013 average of 1.46 million units. The overall market improved in the first half of 2013 but has waned since. Total starts increased marginally and were sustained by multi-family starts. Housing starts were estimated at a seasonally annualized adjusted rate (SAAR) of 1.01 million in May 2014, 9.4% more than in May 2013. Yet, single-family starts (graph 11.4.1) are less than the 1963 level (US Census Bureau, 2014a).

The house sales market did not improve, either. In May 2014, 4.89 million existing (previously owned, annualized figures) houses were sold, compared with 5.15 million in May 2013 – a 5.0% decrease. In May 2014, the median existing house sales price was $209,917, 0.3% lower than in May 2013 (National Association of Realtors, 2014).

New home sales (newly constructed) averaged 431,000 units per month between January and April 2014 (all SAAR). The volume of new-house sales is similar to those in 1966-1970. The median new-house sale price was $277,397 in May 2014, 6.9% higher than in May 2013 (US Census Bureau, 2014b).

GRAPH 11.4.1

US housing units and starts, 1963-2014



Notes: f=forecast (May 2014 data). Seasonally annualized adjusted rate.
Source: US Census Bureau, 2014a.

The substantial number of houses with negative equity in the US also is affecting new housing construction, existing and new house sales and the use of wood products. Hopkins (2014) reported that about 9.7 million houses had negative equity as of May 2014, meaning that the owners of those houses owed more on their mortgage than the house's current appraised value. Some analysts speculate that the high level of negative equity is a reason for the middling housing market – owners of houses with negative equity are reluctant to purchase new houses because of their debt and because of future-financing fears.

Source: UNECE/FAO, 2014.

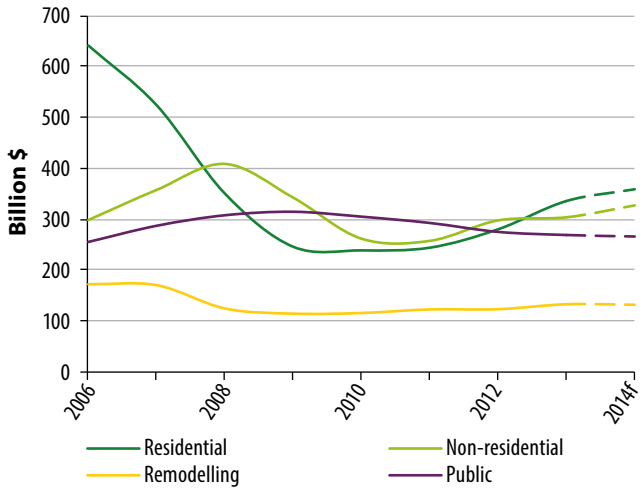
Another factor for the slow-moving housing market is a decline in the formation of households. Household formations are important to housing because, when families are formed, the new households typically rent a dwelling or purchase a house. US annual household formation has decreased by 800,000 in recent times, a 59% decrease from the 2000-2006 average of 1.35 million household formations per year (US Census Bureau, 2014c). The increase in the number of 18-30-year-olds living at home – 45% in 2012, compared with 39% in 1980 (Federal Reserve Bank of Atlanta, 2014) – provides further evidence of this decline. An estimated 1.2 million more young adults were living with their parents in 2012 than in 2006 (Porter, 2014).

The number of households in mortgage arrears and foreclosure decreased in the past year (from April 2013 to April 2014) as a result of increasing numbers of foreclosure sales and housing price gains that resulted in some housing valuations increasing to above the loan amount. The national foreclosure inventory was about 694,000 homes in April 2014 (1.8% of all houses with a mortgage), a decline of 35% compared with April 2013, when 1.1 million homes were in foreclosure (CoreLogic®, 2014).

Housing construction spending is gradually improving (graph 11.4.2), with total private residential construction spending increasing by 7.5% year-over-year from May 2013 to May 2014, to $354.8 billion. Single-family construction spending increased by 10.9% year-over-year, to $187.5 billion; multi-family expenditure increased by 30.7% year-over-year, to $40.4 billion; and house remodelling spending decreased by 2.4% year-over-year, to $126.7 billion (all SAAR) (US Census Bureau, 2014d). Harvard's Leading Indicator of Remodelling Activity (2014) projected that an average $149.5 billion would be spent on remodelling in 2014.

GRAPH 11.4.2

US construction spending, 2006-2014



Notes: f=forecast (May 2014 data). Residential, non-residential and remodeling represent private sector.
Source: US Census Bureau, 2014c.

Historically, US housing has been a major component of US GDP – typically averaging 17-19%. Housing's portion includes: residential investment (construction of new single- and multi-family houses, residential remodelling, production of manufactured homes, and brokers' fees); housing services spending (rent, owner's equivalent rent, and utilities); and expenditure on furnishings and durable goods. Housing-related GDP was 17.6% in the first quarter of 2014, compared with 20.6% in the third quarter of 2005. For construction purposes, residential investment is the most critical component – the best year was 2005, when it was 6.2% of GDP. Residential investment was 3.1% in the fourth quarter of 2013 and in the first quarter of 2014 (US Bureau of Economic Analysis, 2014).

11.4.2 United States construction outlook

The US housing market has stabilized, and data from some sectors indicate an improvement. However, a more robust housing construction and sales market may be hindered by: a tendency for "millennials" (adults born in 1982 or later) to live with their parents; a relatively low level of household formation; student debt; under-employment and stagnant-to-declining median incomes; negative equity; banking regulations (including stringent down-payment requirements); a constrained housing inventory; and a fragile economy. Another potential impediment is a change in attitudes towards home ownership, including a developing trend to rent rather than buy. Attention to such factors is needed because they have major implications for the housing and wood products industries. Several agencies, including the Federal Housing Finance Agency (2014), have projected that a moderate to robust housing recovery is still several years away.

Source: APA, 2014.

11.4.2.1 United States and Canada construction materials

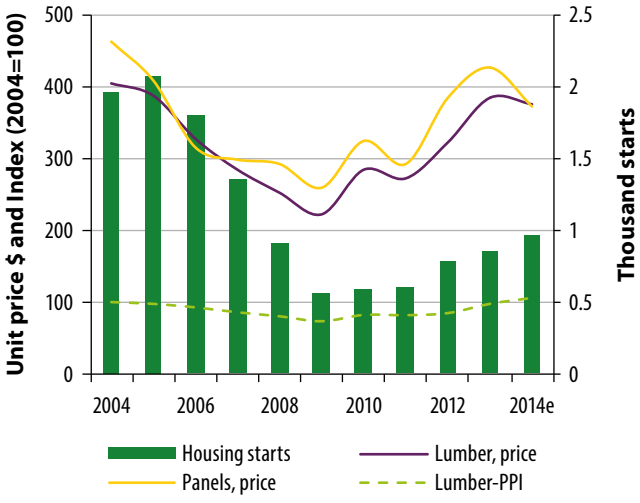
Traditionally, North American sawn softwood, structural panels and associated usage and pricing are greatly influenced by US housing starts. North American houses – particularly single-family houses – have been the primary market for sawn softwood and structural panels. In 2006, about 39% of all solid wood products consumed in the US, and 28% of all solid wood products consumed in Canada, were used in new residential construction. Single-family houses use about 14,800 board feet (25.1 m^3) of lumber products and 16,000 square feet (14.2 m^3) of panel products; by comparison, a typical multi-family unit uses 2,400 board feet (4.1 m^3) of lumber and 1,750 square feet (1.5 m^3) of panel products (Adair and McKeever, 2006). Building-material prices improved dramatically in late 2012 and through mid-2013, in part because of improving housing starts. Due to a subdued housing market (in late 2013) and a sluggish world economy, however, wood-material prices declined in late 2013 (graph 11.4.3).

US lumber consumption is projected to reach 29.6 billion board feet (50.3 million m^3) in 2014, of which about two-thirds will be used for residential housing construction and remodelling. Of the total, 46% will be used for new residential construction. In comparison, new residential lumber consumption was, on average, almost 40% higher in the 1990s (RISI, 2014). Because the US repair and remodelling market uses more lumber than new construction, consumption is forecast to increase by 7.4% in 2014 (Random Lengths, 2014a).

The consumption of wood-based panels also is increasing with improvement in the housing sector, following a similar pattern to sawnwood. The relationship between the demand for housing and prices for panels and sawnwood is linked closely to the number of housing starts (graph 11.4.3).

GRAPH 11.4.3

US building material prices and housing starts, 2004-2013



Notes: e=estimate (May 2014 data). Structural panel composite price unit=1000 square feet, framing lumber composite price unit=1,000 board feet, lumber composite price unit=1,000 board feet, lumber PPI index (2004=100).
Sources: US Bureau of Labor Statistics, 2014; US Census Bureau, 2014a; Random Lengths, 2014b.

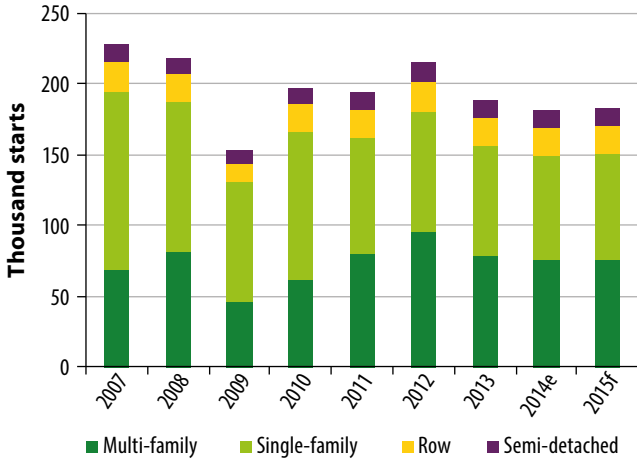
For more information on the effects of housing and construction on sawn softwood and wood-based panels markets, see Chapter 5 (sawn softwood) and Chapter 7 (wood-based panels) of this publication.

11.4.3 Canadian housing construction market

The Canadian housing market is relatively stable, with 187,923 starts estimated for 2013 and 181,100 starts expected in 2014 (Canada Mortgage and Housing Corporation, 2014). Of the expected starts in 2014, 73,000 are forecast to be single-family units and 108,100 to be multi-family. Some 74,500 single-detached unit and 107,600 multi-family unit starts are projected for 2015 (graph 11.4.4) (Canada Mortgage and Housing Corporation, 2014). Despite Canada's lacklustre job growth and record high home prices, home purchasing is stable, with home buyers attracted by near-record low mortgage costs and discounted interest rates (Warren, 2014). The Royal Bank of Canada (2014) expects the Canadian housing market to enter a slow growth phase in 2014 when long-term interest rates begin to rise, projecting home resales to increase by 0.8% in 2014, to 461,000 units. The Canada Mortgage and Housing Corporation (2014) projected moderately increasing home sales of 457,900 units in 2014 and 471,100 units in 2015.

GRAPH 11.4.4

Housing starts in Canada, 2007-2015



Notes: e=estimate. f=forecast.
Source: Canadian Mortgage and Housing Corporation, 2014.

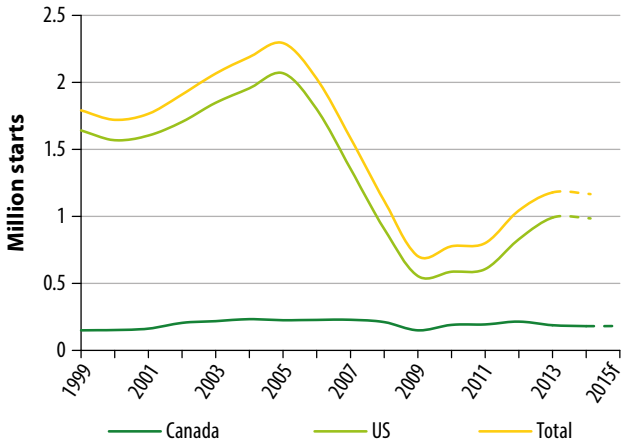
The Canadian economy has been forecast to improve in 2014 and 2015, with GDP increasing to 2.2% in 2014 and 2.5% in 2015. Bendiner (2014) expected real GDP growth to average 2.2% in 2014 and 2.6% in 2015. Employment was forecast to increase by 1.2% in 2014 and by 1.9% in 2015; although modest, this increase in employment would aid the housing market (Canada Mortgage and Housing Corporation, 2014).

11.4.4 US and Canadian housing

The combined housing markets for the US and Canada (graph 11.4.5) still exhibit the after-effects of the housing crash and global recession. Although both markets have improved, there is much room for further improvement.

GRAPH 11.4.5

Housing starts in North America, 1999-2015



Notes: 2014 is an estimate. f=forecast.
Sources: US Census Bureau, 2014c; Canada Mortgage and Housing Corporation, 2014.

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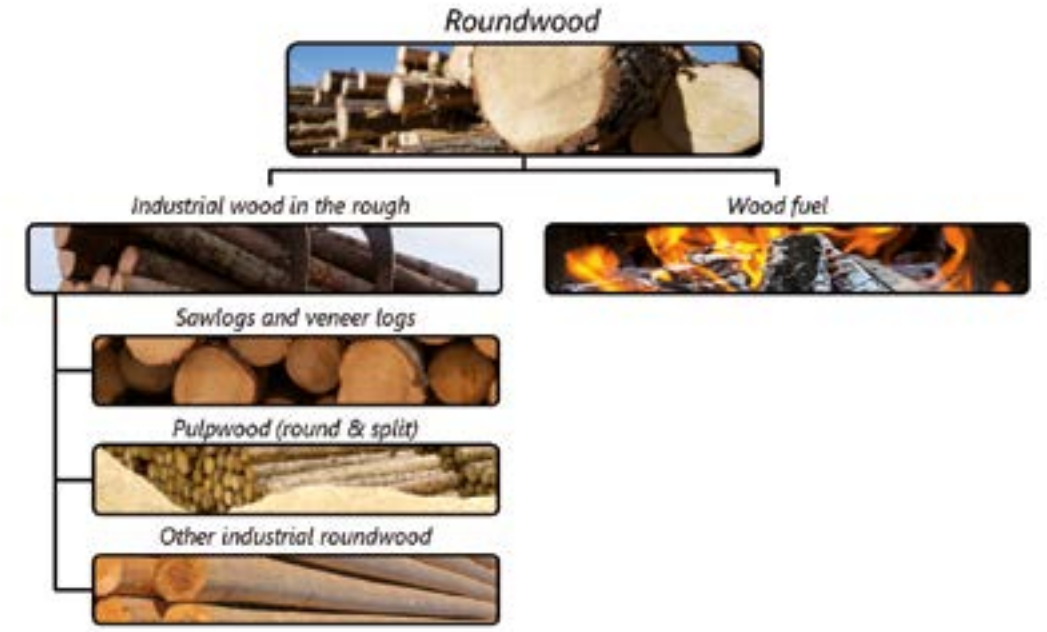
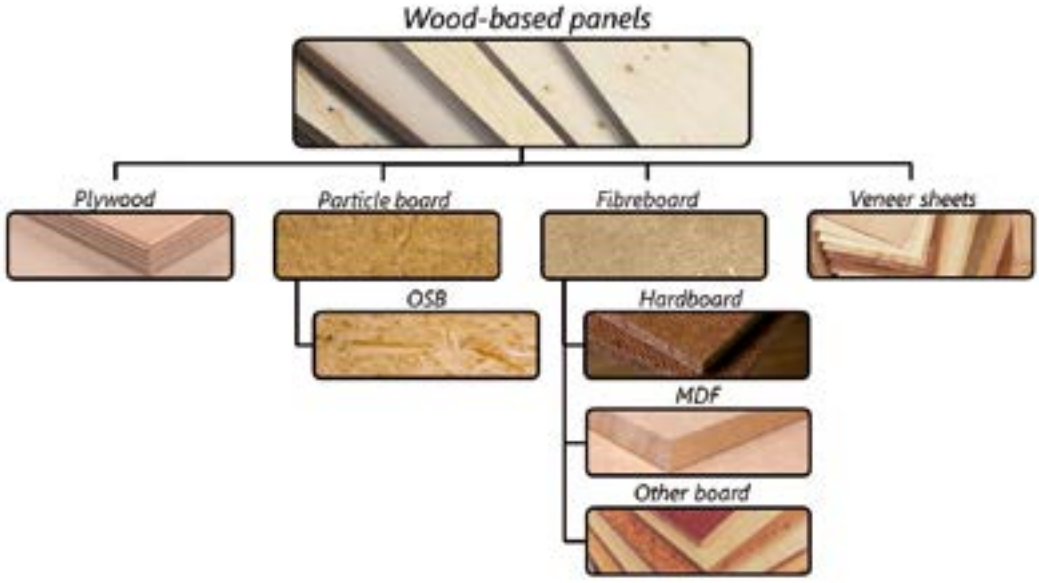
ANNEXES

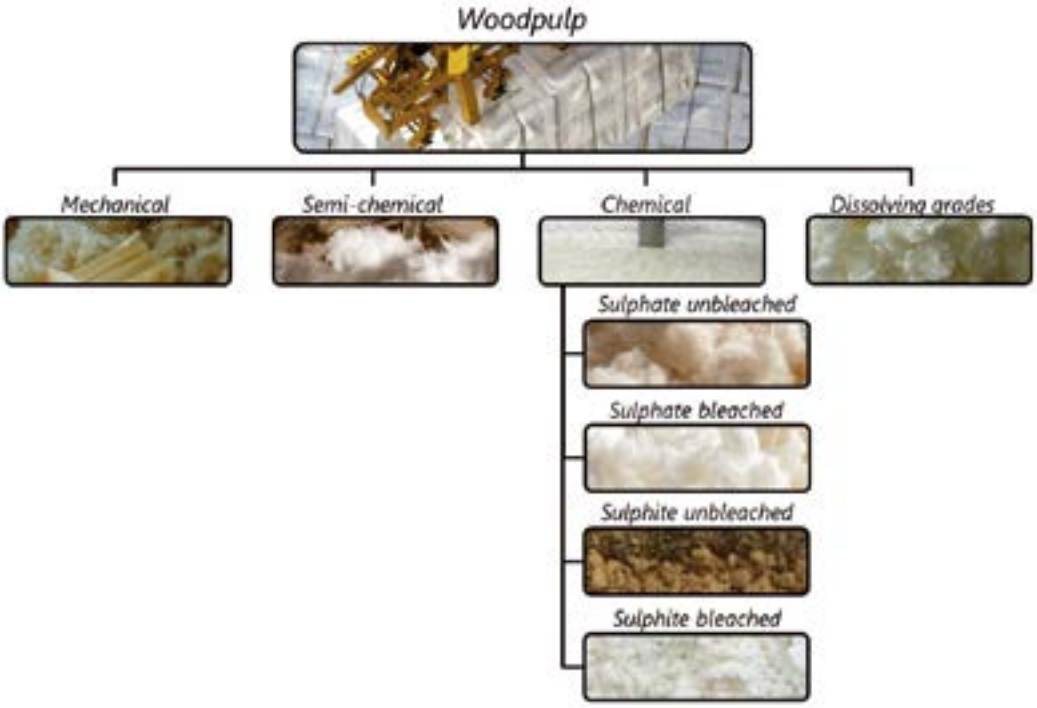
COMPONENTS OF WOOD PRODUCTS GROUPS

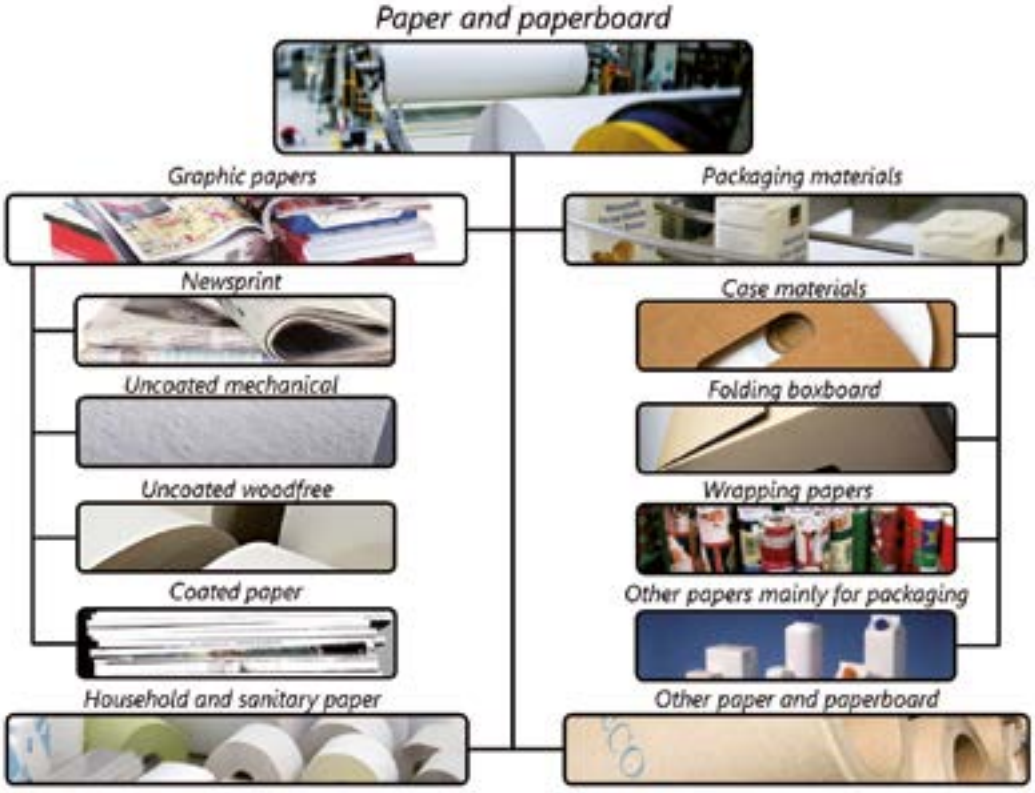
(Based on Joint Forest Sector Questionnaire nomenclature)

The important breakdowns of the major groups of primary forest products are diagrammed below. In addition, many sub-items are further divided into softwood or hardwood. These are: all the roundwood products; sawnwood; veneer sheets; and plywood. Items that do not fit into listed aggregates are not shown. These are wood charcoal; wood chips and particles; wood residues; sawnwood; other pulp; and recovered paper. The sources for pictures used in these diagrams are databanks of Metsä Group (2012), Raunion Saha (2012), Stora Enso (2012) and UPM (2012).






Woodpulp
Mechanical
Semi-chemical
Chemical
Dissolving grades
Sulphate unbleached
Sulphate bleached
Sulphite unbleached
Sulphite bleached


Paper and paperboard
Graphic papers
Packaging materials
Newsprint
Uncoated mechanical
Uncoated woodfree
Coated paper
Household and sanitary paper
Case materials
Folding boxboard
Wrapping papers
Other papers mainly for packaging
Other paper and paperboard

COUNTRIES IN THE UNECE REGION AND ITS SUBREGIONS

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

North America
Canada
United States of America

Europe		
European Union		***Other countries***
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Belgium	Latvia	Andorra
Bulgaria	Lithuania	Bosnia and Herzegovina
Croatia (1.7.2013-)	Luxembourg	Iceland
Cyprus	Malta	Israel
Czech Republic	Netherlands	Liechtenstein
Denmark	Poland	Monaco
Estonia	Portugal	Montenegro
Finland	Romania	Norway
France	Slovakia	San Marino
Germany	Slovenia	Serbia
Greece	Spain	Switzerland
Hungary	Sweden	The former Yugoslav Republic of Macedonia
Ireland	United Kingdom	Turkey

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The UNECE Committee on Forests and the Forest Industries is a principal subsidiary body of the UNECE (United Nations Economic Commission for Europe) 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 Industries 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, 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 the facilitation of 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 the framework for cooperation e.g. by organising 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 to 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 Industries 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;
5. It should also keep under review its structure and priorities and cooperate with other international and intergovernmental organizations active in the sector, and in particular with the FAO (the Food and Agriculture Organization of the United Nations) and its European Forestry Commission, and with the ILO (the International Labour Organisation), in order to ensure complementarity and to avoid duplication, thereby optimizing the use of resources.

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Study Papers are usually based on statistics, forecasts and information submitted by country correspondents in the UNECE region (Europe, North America and the Commonwealth of Independent States). The basic information is often submitted via agreed questionnaires and then complemented by expert analysis from outside and within the secretariat. Study Papers are issued on the responsibility of the secretariat, although the studies most often are the work of many contributors outside UNECE/FAO.

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Forest Products Annual Market Review 2013-2014

The *Forest Products Annual Market Review 2013-2014* 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 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. Other chapters analyse policies, innovative wood products and markets for wood energy, value-added wood products and housing. 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* is a key background document for the Market Discussions held at the annual session of the UNECE Committee on Forests and the Forest Industry, and it also 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 a statistical annex, which is available at: www.unece.org/forests/fpamr2014-annex.html.

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