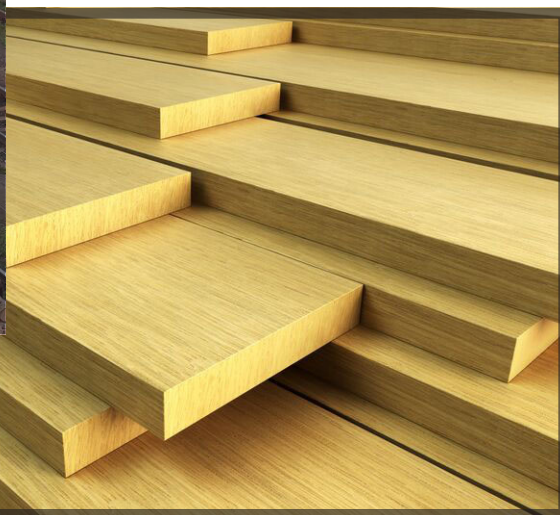
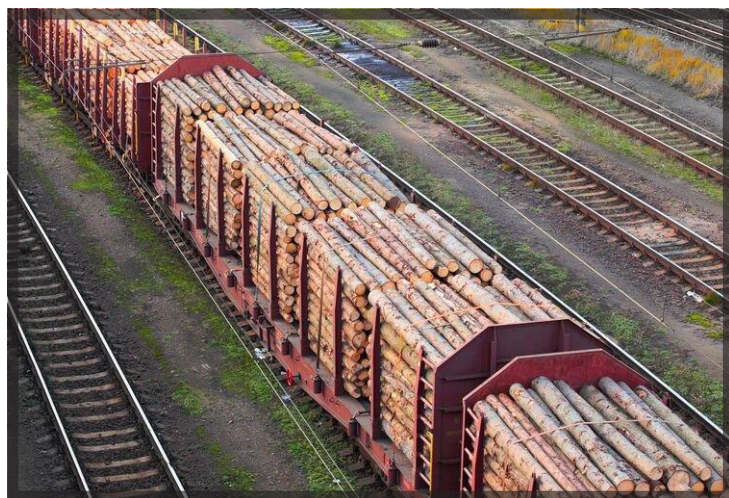




United States Department of Agriculture

U.S. Forest Products Annual Market Review and Prospects, 2012–2016

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Abstract

This report describes the current state and near-term prospective of the U.S. economy supported by general and statistical information on forest products markets in terms of production, trade, consumption, and prices. Market developments are described for sawn softwood, sawn hardwood, softwood log trade, wood-based panels, paper and paperboard, fuelwood, forest product prices, and housing starts. Policy initiatives that can affect domestic markets and international trade in wood products are also discussed in some detail. Data are provided through the end of the year 2014 with estimates for 2015 and forecasts for 2016.

Keywords: production, trade, prices, forest products

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U.S. Forest Products Annual Market Review and Prospects, 2012–2016

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Executive Summary

Economic activity in the United States exhibited resiliency during 4th quarter 2015, and the outlook for growth into 2016 is stronger than previously forecasted. This outlook is confirmed by the increase in the estimated annual rate of real gross domestic product (GDP) to 2.4% in 2015 up from the previously expected 2.3%. Economic activity during 2016 is projected to increase to an annual rate of 2.6%. The rate of growth in the U.S. economy will probably increase slightly in the first half of 2016 then flatten out as predicted by 45 forecasters surveyed by the Federal Reserve Bank of Philadelphia (FRB) (FRB 2015). The flat growth rate in the U.S. economy predicted for 2016 results partly from decreasing growth in exports for the U.S. economy as Chinese imports decline. Indications are that global trade is decreasing, diminishing the prospects that exports will buoy the U.S. economy in the coming months as exports to China have declined. Growth in U.S. real output looks weaker and inflation looks low over the near term compared with previous estimates. Forecasters expect the labor market to remain nearly unchanged to slightly improved in 2015, measured on an annual-average basis. Unemployment is expected to fall from 5.0% in 4th quarter 2015 to 4.9% in 1st quarter 2016, then decline further to 4.8% in 2nd quarter 2016. The unemployment rate was 8.1% at the beginning of 2012 because many unemployed stopped looking for work, and the unemployment rate declined, on average, a full percentage point each year since. The forecasters predicted unchanged prices in 1st quarter 2016, which is a slightly lower rate than previously expected, and then flat prices in 2nd and 3rd quarter 2016. New and existing home sales were weaker during the first 11 months of 2015 than the previous year; the housing recovery lost momentum during the 2nd half of 2015. New home sales through the 2nd half of the year have averaged an annualized rate of 482,000 homes, down almost 5% from the 1st half average sales rate of 507,000 homes. Sales of existing single-family homes, condominiums, and townhouses fell 10.5% in November to an annual rate of 4.76 million units (NAHB 2015). The industry finds this decrease discouraging, although total housing starts in 2015 exceeded starts in 2014.

Growth in the housing sector continued to have a positive effect on softwood lumber consumption in 2015. According to the Western Wood Products Association (WWPA 2016),

during the first 10 months of 2015, softwood lumber consumption increased 1.2% compared with the same period in 2014 and shipments of softwood lumber from western mills declined 0.5% during the first 10 months of 2015 compared with the same period in 2014. The South continues to have higher levels of softwood lumber production and shipments than any other region.

Total structural panel production increased by just 0.2% in 2015 compared with 2014. Structural panel consumption in 2015 was 1.0 million m³ greater than the same time period of a year ago, representing a 4.5% increase compared with 2014. Overall, structural panel consumption increased to 27.2 million m³ in 2015 (APA 2016).

Roundwood production for pulp and wood-based panel mills was 141 million m³ in 2014, which was up slightly from 2013. It is forecast that roundwood pulpwood consumption will increase during 2015. Pulpwood supplied from residues could continue to increase in 2015 relative to roundwood because of the increased housing construction and wood products industry. It is also possible that supply from residues could decrease with increased competition for residues to produce pellets or biomass for power.

U.S. exports of all timber products combined to China fell throughout the first 11 months of 2015 compared with the same time period in 2014. Unlike all timber products combined, lumber exports to China increased during the first 11 months of 2015, totaling 46 million m³, a 1.8% increase compared with the same period in 2014 (WWPA 2016).

U.S. furniture industry production was up 11.0% in 4th quarter 2015 compared with 3rd quarter 2015, at an annualized rate. The domestic industry share of U.S. consumption stabilized after eroding because of low-cost furniture imports, a sluggish global economy, and a need for the industry to become more consumer-focused. Employment in the domestic furniture industry has fallen more than 50% since 1999.

General Economic and Major Market Trends

According to 45 forecasters surveyed by the Federal Reserve Bank of Philadelphia (FRB 2015), the U.S. economy grew at a weaker rate during 4th quarter 2015 than during

3rd quarter but the expectations of continued growth into 2016 are good. The forecasters expect real GDP to grow at an annual rate of 2.4% in 2015. The increased optimism about the labor market accompanies the outlook for stronger output growth. Average unemployment was 6.3% in 2014. The 45 forecasters expect unemployment to decline to 5.3% in 2015. This decline in unemployment equates to nonfarm payroll employment growing at a rate of 201,500 jobs per month during 3rd quarter 2015 and 188,200 jobs per month during 4th quarter 2015. On an annual-average basis, the forecasters expect job gains of 241,800 per month in 2015 and 197,000 per month in 2016. During the recession from 2007 to 2009, the impact on the job market was 8 million jobs lost in the worst economic downturn since the 1930s Great Depression. Almost every sector experienced job cuts: construction lost 2 million jobs, financial services lost 800,000 jobs, and the auto sector lost thousands of jobs. There were already about 7 million adults looking for full-time employment before the recession hit in December 2007. The U.S. economy must create about 125,000 new jobs per month just to keep up with population growth and to prevent unemployment from rising. The strength of GDP growth will be the major determinant of when the U.S. economy reaches full employment. With strong GDP growth, full employment could be reached in 2 years. But if GDP growth is weak, reaching full employment could take several years.

Core inflation, as measured by the price index for personal consumption expenditures, is expected to average 1.5% in 2015 then increase to 1.6% into 2016. On an annual-average over annual-average basis, inflation in the core consumer price index is projected to remain around 1.9% in 2015 and stay level at 2.0% in 2016 (FRB 2015).

New housing construction slowed during 4th quarter 2015, when 1,149,000 units were started in December at a seasonally adjusted annual rate (NAHB 2015). The decline in December was caused by lower single and multifamily starts. For the 4th quarter, single-family starts averaged an annual rate of 759,000 units, up from 745,000 units in the 3rd quarter. Multifamily starts in the 4th quarter averaged an annual rate of 374,000 units, down from the 3rd quarter rate of 414,000 units. All regions in the United States contributed to the increase in the level of housing starts in December of 2015. December single-family permit estimates were up 3.7% in the Northeast and the South and were down 0.9% in the Midwest and 1.2% in the West. Despite these small downturns, builders remain optimistic for continued strength in the single-family housing market. The South is the largest region for multifamily starts, and the annual rate decreased 1.0% in December 2015. Although the authorization of multifamily permits was off in December, the 4-month moving average increased to an annualized rate of 476,000 units. New single-family units completed increased

in November to 632,000 units, from 630,000 in October. Total housing starts for 2015 were 1,111,000 units, up 10.8% from 2014, and expectations for 2016 are for slight improvement.

In November 2015, the annual rate for total value of all new construction in the United States was \$1,122 billion, \$106 billion higher than the annual November 2014 value of \$1,016 billion (NAHB 2015). Month over month, the 2015 seasonally adjusted annual rate for the total value of new construction was higher than the 2014 annual rate for each month through November 2015. Residential construction was \$428 billion in November 2015, \$42 billion above the \$386 billion annual rate of residential construction in 2014. Nonresidential construction accounts for approximately 25% to 35% of all construction value in the United States. It too was affected by the distant economic recession, but not as severely as residential construction. Nonresidential construction is typically divided between the construction of buildings (stores, offices, schools, etc.) and structures other than buildings (dams, bridges, etc.). In 2015, construction of buildings, which is the largest market for wood in nonresidential construction, was at an annual rate of \$386 billion, compared with \$330 billion in 2014 and \$303 billion in 2013. The highest rate ever achieved was in 2008 when the construction of nonresidential buildings was nearly \$409 billion. The National Association of Home Builders 2016 forecast calls for the housing sector to improve in the 1st quarter and starts and sales overall for 2016 to end the year above 2015 levels (NAHB 2015).

With a large forest resource and high production and consumption of wood products, the United States continues to play an important role in world forest product markets. For the past three years, the U.S. role on the world stage has grown as a result of the on-going recovery in the construction sector. The United States is a world leader in the consumption of paper and paperboard (about 72 million metric tons in 2014), which is mostly supplied by domestic production and imports from Canada (AF&PA 2015). Domestic paper and paperboard production for the first 11 months of 2015 was about 1.0% below the production for the first 11 months of 2014. This decline is mainly reflected in the printing and writing grades of paper, as electronic media continues to grab market share from printed media. The U.S. solid wood industry manufactured about 73 million m³ of lumber and 20 million m³ of structural panel products in 2014. For the first 10 months of 2015, softwood lumber production was 1.2% above 2014 production, and for all of 2015, structural panel consumption was 4.5% above 2014 levels. The U.S. forest products industry's annual harvest was 414 million m³ in 2014, exceeding the 388 million m³ harvested in 2013. Domestic roundwood timber harvest in 2015, which supports domestic consumption, is expected to be above the 2014 harvest level.

Table 1—Selected U.S. economic indicators, 2012–2016

Indicator	Actual ^a			Estimate ^b	Forecast ^c
	2012	2013	2014	2015	2016
Gross domestic product (billion (10 ⁹) 2009 dollars)	16,245	16,768	17,420	17,600	17,905
New housing starts (million units)	0.781	0.925	1.003	1.1	1.133
Mobile home shipments (thousand units)	55	60	64	65	67
Expenditures for private residential improvements (million 2009 dollars)	110	112	119	126	130
Total private residential fixed investment (billion (10 ⁹) 2009 dollars)	437	478	486	530	538
Total private nonresidential fixed investment (billion (10 ⁹) 2009 dollars)	1,964	2,024	2,148	2,209	2,253
Total industrial production (Index: 2012 = 100)	100.0	101.9	104.9	105.2	108.0
Furniture and related products (Index: 2009 = 100)	84.8	73.1	78.1	80.0	81.0
Paper products (Index: 2009 = 100)	83.7	75.5	82.7	84.0	85.0

^aBoard of Governors of the Federal Reserve System (2016); Council of Economic Advisors (2015); NAHB (2015); U.S. Department of Commerce, Bureau of the Census (2016); U.S. Department of Commerce, Bureau of Economic Analysis (2016).

^bForest Service estimates based on 2014 actual data and preliminary 2015 data.

^cNAHB (2014); FRB (2015); and Forest Service estimates.

Expenditures for private residential improvements increased to \$119 billion (2009 \$) in 2014 and to nearly \$126 billion in 2015, up in excess of 5% per year from 2013 (Table 1). Despite these increases, expenditures are still below record highs achieved in 2005 through 2007 when improvement expenditures averaged more than \$140 billion (2009 \$) per year. The continued recovery in the housing market is also reflected in residential improvements as expenditures are expected to reach \$130 billion (2009 \$) in 2016. The National Association of Home Builders Remodeling Market Index (RMI) climbed to 59.0 in 2nd quarter 2015, up from 57.0 in the 1st quarter, and then dropped to 58 in 4th quarter 2015. This index level is above the record level in 2004 prior to the housing market crash. During this same period, new residential construction exhibited continuing strength, which will continue into 2016. Since 2000, expenditures for maintenance and repairs to existing private residential properties are estimated to be about one half that of improvements to residential properties. The housing recession which hit the United States in 2007 had a delayed impact on residential improvements. Unprecedented levels of home foreclosures initially helped residential improvements and residential maintenance and repairs capture a larger share of the housing market. Many existing home owners who were unable to sell in need of larger or updated homes chose to improve their existing homes rather than try to sell in the depressed housing market. At the same time, many of the foreclosed homes needed significant maintenance to become marketable. Expenditures were eventually affected by the recession with steady declines occurring through 2010. As the economy improved and the housing market rebounded, expenditures for residential improvements also improved. Expectations are for continued modest investments for residential improvements.

Two of the three major indicators of demand for wood products—furniture and related products, paper products output, and total industrial production—were lower during the first 8 months of 2015 compared with 2014.

Industrial production, an important demand determinant for pallet lumber, containerboard, and some grades of paper, increased about 2.5% per year, on average, from 2011 through 2014. In 2015, growth slowed to just 0.3%. Industrial production increased 0.9% in January 2016 after decreasing 0.7% in December 2015. Industrial production then fell by 0.5% in February. Expectations are for modest increases in industrial production throughout 2016.

Furniture and related products output (a determinant of high-grade lumber production) and industrial grades of plywood and OSB for upholstered furniture frames were up 2.9% during the first 8 months of 2015.

Paper products output (a determinant of pulpwood and wood residue use), as well as recycled fiber availability and use, decreased during the first 8 months of 2015 compared with the 2014 average. The index (2007 = 100) of paper products output for the first 8 months of 2015 was 0.8% below the 2014 average for the comparable time period.

In summary, the housing sector gained strength during the first three quarters of 2015 but weakened somewhat in 4th quarter 2015. This sector is expected to stay strong into 2016. Housing starts in 2015 exceeded levels of the year before by almost 11%. Even with a slow rate of GDP growth, 2015 has been a good year overall as noted by the growth in timber markets. Selected U.S. economic indicators are shown in Table 1.

Table 2—Prospects and statistics for wood and wood products, 2014-2016 (in 1,000 m³)^a

	2014	2015	2016		2014	2015	2016
Sawn softwood				Oriented strandboard (OSB)			
Production	53,543	53,804	54,000	Production	11,512	11,755	11,950
Imports	21,639	21,705	21,802	Imports	3,982	4,539	4,650
Exports	2,948	2,922	2,906	Exports	286	225	200
Consumption	72,234	72,587	72,896	Consumption	15,208	16,070	16,400
Coniferous logs				Particleboard			
Production	129,124	130,000	130,026	Production	4,225	4,300	4,370
Imports	448	575	700	Imports	520	599	608
Exports	7,534	7,600	7,643	Exports	327	335	304
Consumption	122,038	122,975	123,083	Consumption	4,418	4,564	4,674
Sawn hardwood				Medium-density fiberboard (MDF)			
Production	19,600	18,900	18,804	Production	2,949	3,200	3,275
Imports	980	970	950	Imports	1,425	1,475	1,500
Exports	3,300	3,200	2,900	Exports	330	350	360
Consumption	17,280	16,670	16,854	Consumption	4,044	4,325	4,415
Hardwood logs				Insulation board			
Production	37,451	37,500	37,450	Production	2,755	2,755	2,755
Imports	1,500	1,550	1,575	Imports	150	177	177
Exports	3,952	3,966	3,800	Exports	129	140	140
Consumption	34,999	35,084	35,225	Consumption	2,776	2,792	2,792
Coniferous plywood				Roundwood pulpwood			
Production	7,952	7,745	7,700	Production	139,771	139,822	138,878
Imports	635	943	1,100	Imports	533	533	533
Exports	689	564	500	Exports	446	446	446
Consumption	7,898	8,123	8,300	Consumption	139,858	139,909	138,965
Nonconiferous plywood				Hardboard			
Production	1,600	1,775	1,800	Production	620	670	705
Imports	2,310	2,260	2,270	Imports	172	150	135
Exports	222	227	235	Exports	166	142	135
Consumption	3,688	3,808	3,835	Consumption	626	678	705

^aData for 2015 are final annual estimates or Forest Service linear extrapolated estimates; 2016 data are Forest Service linear extrapolated forecasts.

Timber Products Production, Trade, and Consumption

Statistics and Prospects

Prospects for wood and wood products are shown in Table 2. All volumes are reported in 1,000 m³. Data for 2015 are preliminary and/or final estimates; data for 2016 are forecasts.

U.S. Wood Product Market Shares

Annual U.S. solid wood products production and foreign trade data are collected annually by governmental agencies and industry associations. This information provides an overview of how robust the wood-using sectors of the U.S. economy are and how their performance has changed with

time (Howard and Jones 2016). It does not provide detailed information specific to individual end-use markets needed to further evaluate changing patterns of consumption. End-use markets of interest include new single-family, multifamily, and mobile home construction, repair and remodeling of existing residential structures, low-rise nonresidential building and other types of nonresidential construction, furniture and other manufactured wood products, and packaging and shipping. These end-use markets typically account for 80% to 90% of all solid wood products consumption. Market share estimates presented here are based on findings from limited public and private research reports that were related to more readily available, annual economic indicator data specific to each end-use market. Consumption was balanced over all end uses, and market shares were developed. These esti-

mates provide a consistent, reliable look at solid wood products markets in the United States (McKeever and Howard 2011).

Table 3 presents annual balanced wood products consumption, by end use for sawn wood, structural panels, and non-structural panels for the period 2010 through 2014, with preliminary estimates for 2015 and forecasts for 2016. Figure 1 shows market shares for all solid wood products combined for the same time period.

Sawn Softwood

Housing and other construction markets started off strong in 2015 and strengthened in 4th quarter 2015. The housing market is likely to finish the year at a higher level than recorded the year before. The housing sector is improving as evidenced by its overall increasing market share and is having a positive effect on softwood lumber consumption (Fig. 1; Table 3). According to the Western Wood Products Association, during the first 11 months of 2015, softwood lumber consumption increased 4.7% from the same period the year before and shipments of softwood lumber from western mills also increased 0.2% during the first 11 months of 2015 compared with the same period in 2014 (WWPA 2016). Production increased 3.0% during this period in the South. Apparent consumption for the first 11 months of 2015 was 69.3 million m³, 4.7% above the 66.1 million m³ for the first 11 months of 2014. As predicted, the U.S. housing construction industry grew during the first half of 2015. As a result of a strengthening domestic market, timber production continued to increase in 2015 slightly above the 2014 timber growth level. Production of sawn softwood in 2015 exceeded 2014 levels and is expected to continue to gradually increase throughout 2016.

Sawn softwood imports increased 34.9% during the first 11 months of 2015 relative to the same time period the previous year. The volume of Canadian imports, which constituted 98% of all sawn softwood imports, increased by 5.6% during this period. Total sawn softwood imports were 21.7 million m³ in 2014.

During the first 6 months of 2015, U.S. sawn softwood exports decreased 13.6% compared with the same period in 2014. Exports to Canada decreased 34.5%, exports to China decreased 30.5%, and exports to Mexico increased 8.9%.

Sawn Hardwood

Sawn hardwood production is expected to decrease to 18.9 million m³ in 2015. Imports in 2015 are expected to decrease from the previous year. Given the decrease in U.S. production and imports and despite a strengthening housing market, apparent consumption for 2015 is forecast to fall below the 2014 volume.

Softwood Log Trade

Softwood log exports to China decreased 31.4% during the first 11 months of 2015 compared with the same period of 2014. Softwood log exports to Canada increased by 13.3% in the same period. Softwood log exports to all other countries decreased by 49.1% during the first 11 months of 2015 compared with the same time period of the previous year. Fueling the decrease in softwood log exports especially during 4th quarter 2015 is the decreased exports to China as China's economy continues a period of contraction. Most of the U.S. export increase has been centered in Canada. Overall, the volume of U.S. logs shipped to China fell by 1.1 million m³ in 2015 to an estimated 2.1 million m³ in 2015, or about 51% of the region's total log production. Softwood log imports in 2015 totaled 575,000 m³, 28% greater than 2014. Nearly all softwood log imports, in excess of 98%, were from Canada. Expectations are for continued growth softwood log imports in 2016.

Hardwood Log Trade

During 2014, hardwood log exports decreased by 0.4% and imports rose by 3.3% compared with 2013. Canada traditionally provides about 95% of U.S. imports. The trend in hardwood log exports was down from the previous year through the first 6 months of 2015. Hardwood log imports were also up slightly through the first 6 months of 2015 compared with 2014.

Pulpwood

Roundwood production for pulp and wood-based panel mills was 139 million m³ in 2014, down slightly from 2013. Roundwood pulpwood consumption is expected to decrease during 2015 as indicated by a 0.2% decline in paperboard production during the first 7 months of 2015. Pulpwood supplied from residues continued to decrease relative to roundwood. This is a result of declining residual production caused in part by increased production efficiencies and competition for residuals for pellets and biomass, not out of preference on the part of pulp producers. The residue portion of pulpwood was 23.0 million m³ in 2014, up slightly from 2013 (Howard and Jones 2016). Trade patterns have continued to have a significant impact on paper and paperboard production and have affected pulpwood use, but the significant decline in U.S. paper and board production and consumption that occurred over the past decade was largely caused by a downturn in consumer spending associated with the U.S. and global recession. Electronic media has also negatively impacted paper and board consumption. Dramatic decreases continue to erode the use of paper for bill receipt and paying, advertising, and personal communications. Since 2000, the volume of first class mail has fallen from 104 billion pieces to 62 billion pieces in 2015 (USPS 2015). Exports of paper, paperboard, and converted products

Table 3—Wood product market share percentages in the United States, by end use, 2010–2016

Year ^a	Table 3. Wood product market share percentages in the United States, by end use, 2010-2016															
	Residential construction															
	New housing				Repair & remodel- ing	Total	Nonresidential construction			Total construc- tion	Manufacturing			Packaging & shipping	Total reported end uses	Other
	New single family	New multi-family	Manu- factured housing	Total			Build- ings	Other	Total		Furni- ture	Other mfg.	Total			
Sawn softwood ^b																
2010	22	2	2	26	29	54	9	2	11	65	3	6	9	11	85	15
2011	20	3	2	25	30	55	8	2	10	65	3	6	10	11	86	14
2012	23	4	1	29	28	57	8	2	10	66	3	6	9	10	86	14
2013	25	5	1	31	27	59	7	2	9	67	3	6	9	10	86	14
2014	25	6	1	32	27	59	7	2	9	68	3	6	8	10	86	14
2015	28	6	1	35	26	61	7	2	9	70	3	5	8	9	87	13
2016	29	7	1	37	26	63	7	2	9	72	3	5	8	9	89	11
Sawn hardwood																
2010	2	0	0	2	6	8	4	13	17	25	11	11	22	43	90	10
2011	2	0	0	2	6	8	4	11	14	22	10	11	21	47	90	10
2012	2	1	0	3	6	8	4	11	15	24	10	10	20	46	90	10
2013	2	1	0	3	5	8	3	10	13	21	8	9	17	41	79	21
2014	2	1	0	3	5	8	3	9	13	21	8	9	17	41	79	21
2015	2	1	0	4	5	9	3	9	12	21	8	8	17	41	79	21
2016	3	1	0	4	6	10	4	10	14	24	9	9	18	43	85	15
Total sawnwood																
2010	19	2	1	22	25	48	8	4	12	59	4	7	11	16	86	14
2011	17	3	1	22	26	47	7	3	11	58	4	7	11	17	86	14
2012	21	4	1	25	25	50	7	3	10	61	4	7	11	15	86	14
2013	22	4	1	28	24	52	7	3	10	62	4	6	10	15	86	14
2014	22	5	1	28	24	52	7	3	10	62	4	6	10	15	86	14
2015	24	5	1	31	23	53	6	3	9	63	4	6	9	14	86	14
2016	24	6	1	31	22	53	6	3	10	63	4	6	10	16	88	12
Coniferous plywood																
2010	10	1	0	12	30	42	18	3	21	63	5	17	22	8	93	7
2011	10	1	0	12	32	43	18	3	21	64	6	18	24	8	96	4
2012	12	2	0	14	30	44	17	3	20	64	5	18	23	7	95	5
2013	14	2	0	16	30	46	17	3	20	66	5	17	22	7	96	4
2014	13	3	0	16	29	46	17	3	20	65	5	17	22	7	95	5
2015	15	3	0	18	29	47	17	3	19	67	5	16	21	7	95	5
2016	15	3	0	18	30	48	17	3	20	68	5	17	21	8	97	3
Oriented strandboard (OSB)																
2010	40	3	3	46	19	64	13	3	16	80	0	1	1	4	86	14
2011	37	4	4	45	20	64	14	2	16	80	0	1	1	4	86	14
2012	45	5	3	54	19	73	14	2	16	89	0	1	1	4	95	5
2013	46	6	3	55	18	73	13	2	15	87	0	1	1	4	92	8
2014	47	7	3	58	17	75	13	2	15	90	0	1	1	4	95	5
2015	50	8	3	61	16	77	12	2	14	90	0	1	1	4	95	5
2016	51	8	3	62	17	79	12	2	15	93	0	0	1	3	97	3
Total structural panels																
2010	27	2	2	32	23	55	15	3	18	73	2	8	10	6	89	11
2011	26	3	2	31	25	56	15	3	18	74	3	8	11	6	90	10
2012	29	4	2	35	24	59	15	3	18	78	3	9	12	6	95	5
2013	30	4	2	36	24	60	15	2	17	77	3	9	11	5	94	6
2014	31	5	2	38	23	61	15	2	17	78	3	9	11	5	95	5
2015	33	5	2	41	22	63	14	2	16	79	3	8	11	5	95	5
2016	39	6	2	48	21	69	14	3	16	85	2	6	7	5	97	3
Nonstructural panels ^c																
2010	12	2	1	15	14	29	10	1	10	40	22	22	44	2	85	15
2011	10	3	1	14	15	29	9	0	10	38	22	24	46	2	85	15
2012	12	4	1	16	14	30	9	0	9	40	21	23	45	1	86	14
2013	13	4	1	18	14	33	9	0	9	42	22	23	44	1	88	12
2014	14	5	1	20	14	34	9	0	9	43	22	22	44	1	89	11
2015	14	6	1	21	14	35	9	0	9	44	23	22	44	1	89	11
2016	14	6	1	22	14	36	9	0	9	45	23	22	44	2	92	8

^a2010–2014 revised, 2015 preliminary, 2016 forecast. 2010–2015 taken from Howard and McKeever (2015) (some minor revisions). 2016 estimated.^bIncludes laminated veneer lumber.^cIncludes particleboard, medium-density fiberboard, insulation board, hardboard, and nonconiferous plywood.

decreased by 3.0% to 9.3 million metric tons, whereas imports of paper and paperboard decreased by 1.2% to 8.1 million metric tons during the first 8 months of 2015. Paper and paperboard production decreased by 1.2% in 2014 falling to 72.4 million metric tons. The production of paper and paperboard in 2016 is forecast to be down from 2015 production as reflected in the annual year-to-date rate for August 2016 of 47.3 million metric tons, which is down 1.1% from 2015 when paper and paperboard was produced at a level of 47.3 million metric tons. Paper and paperboard imports were at an annual rate in August 2016 of 7.8 million metric tons, which is down 4.4% from the previous year.

Structural Panels

Structural panel production in 2015 was basically unchanged from 2014, whereas consumption was 4.5% higher than consumption in 2014 (APA 2016; Elling 2015). Structural panel production in 2015 was 19.5 million m³, which is about level with 2014. Structural panel market shares were negatively affected by the recent economic downturn. New residential construction, which in 2006 captured 46% of all structural panel consumption, fell to 35% in 2011, but it is expected to rebound and continue increasing in 2016 (Table 3). In 2015, U.S. producers also felt the impact of the surge in plywood imports from South America caused by the strength of the U.S. dollar.

In 2015, 11.8 million m³ of OSB were produced (APA 2016) (Table 2). In 2015, OSB consumption was 16.1 million m³ and constituted 67% of the structural panel market. This represented a 6% share increase compared with 2008. Consumption is expected to further increase in 2016. The continuing economic recovery and growing residential construction sector is expected to increase OSB consumption in 2016 to 16.4 million m³.

Softwood plywood production was 7.7 million m³ in 2015 (Table 2) (APA 2016). This level of production was slightly below that of 2014 and substantially below previous years. Softwood plywood production has fallen fairly steadily since the late 1980s when it totaled nearly 19.6 million m³ in 1987. Expectations are for production to remain at about 7.7 million m³. Because of a strong U.S. dollar, softwood plywood imports increased substantially in 2015 by nearly 50% compared with 2014. Conversely, softwood plywood exports in 2015 declined by just under 500 million m³, an 18% decrease from 2014. Plywood exports to Canada increased by 3.2% during the first two quarters in 2015 compared with the previous year, and plywood imports from Canada decreased 21.6%. Softwood plywood consumption was 4.0 million m³ at the end of 2nd quarter 2015, which was 2.8% higher than the previous year. Apparent consumption of softwood plywood increased by about 2.0% in 2015 compared with 2014.

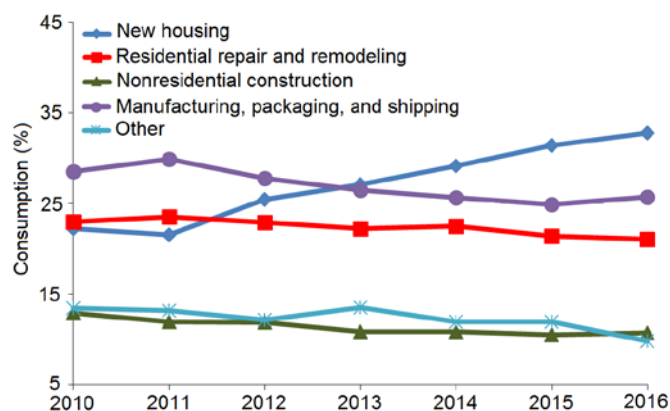


Figure 1. Solid wood timber products consumption market shares, 2010–2016.

Hardwood Plywood

Hardwood plywood production, including core material such as particleboard and medium-density fiberboard (MDF), was estimated at 1.6 million m³ in 2014, up slightly from 2013 production. Hardwood plywood imports increased 4.1% in 2014 climbing to 2.3 million m³ compared with 2013. Hardwood plywood exports rose in 2014, increasing 7.8% to 222,000 m³. Production and consumption of hardwood plywood in 2015 and 2016 are forecasted to steadily rise (Table 2). These increases are a result of rising total industrial production and production of furniture and related products (Table 1) coupled with the U.S. housing market rebound.

Particleboard and Medium-Density Fiberboard

Information from the Composite Panel Association (CPA 2015) indicates that both particleboard and MDF production increased in 2015 compared with 2014. In 2015, particleboard production was 4.3 million m³, an increase of nearly 2%, and MDF production was 3.2 million m³, an increase of nearly 9% (Table 2). Both imports and exports of particleboard and MDF increased in 2015 compared with 2014, resulting in increased total consumption in 2015 compared with 2014. Particleboard and MDF account for well over one-half of all nonstructural panels consumed in the United States, being used principally for furniture, fixtures, millwork, and other manufactured products. Markets for particleboard and MDF are expected to increase modestly in 2016 (Table 3).

Hardboard

Based on data from the Composite Panel Association (CPA 2015), 780,000 m³ of hardboard were produced in 2014 in the United States and Canada; this level of production is expected to increase slightly in 2015. Hardboard imports and exports are expected to remain flat during the next 2 years.

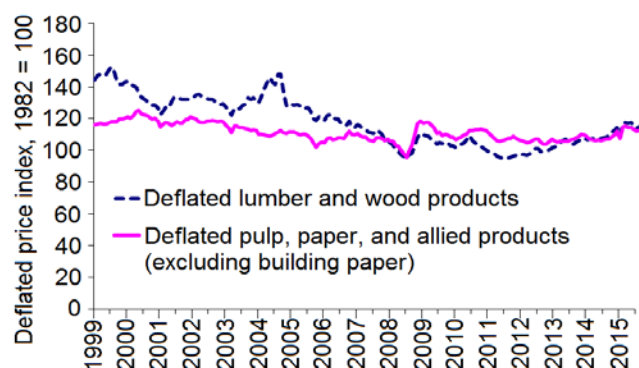


Figure 2. Wholesale prices of forest products, 1999–2015.

Insulation Board

Information from the American Forest & Paper Association (AF&PA 2015) showed that 2.7 million m³ of insulation board were produced in 2015, which was unchanged from 2014. Production of insulation board has been flat for several years, resulting in a stable level of apparent annual consumption of about 3.0 million m³.

Fuelwood

With data from the 2015 Energy Information Administration report (EIA 2015) and adjusting for the 2015 winter weather and an increasing trend in fuelwood use per household, fuelwood consumption was estimated to be 44.0 million m³ in 2015, an increase of 2.4% compared with 2014. Households mostly use fuelwood for heating and aesthetic enjoyment. Some forest products manufacturing facilities use mill residues rather than roundwood for fuel. A small portion of roundwood fuelwood is used for electric power production. Use for heat and/or electricity production is limited by the low cost of coal and natural gas alternatives. Fuelwood consumption for 2015 was higher than the level for 2014, and the forecast calls for increased fuelwood consumption through 2015. Renewable fuel standards and other biomass-related energy policies are unlikely to increase the growth rate for fuelwood production and consumption but are likely to increase other forms of wood energy use such as pellets. The United States produced 6.9 million metric tons of wood pellets in 2014, of which about 42% were consumed domestically (UNECE/FAO 2015).

Forest Products Prices

Trends in the wholesale price of forest products are different across two broad categories: lumber and wood products (such as lumber and wood-based panels) and pulp and paper products (Fig. 2). Throughout the late 1990s, the producer price index (PPI) continued to fluctuate around a level reached by the mid-1990s before peaking during the second half of 1999 (U.S. Department of Labor, Bureau of Labor Statistics 2015). The PPI for lumber and wood products

continued to decrease during 1st quarter 2008 but rose and peaked in 3rd quarter and then declined again in 4th quarter. The PPI for lumber was down 7.3 points in 2009 from 2008. Changes in the price of softwood lumber and a depressed lumber market accounted for much of this change and most of the volatility in the index. In 1999, the deflated composite price index reached an all-time high (at a level more than 50% higher than that of the base year, 1982), followed immediately by a sustained decline that continued from 2000 to 2011. The PPIs for both lumber and pulp, paper, and allied products have been increasing since 2011, throughout 2015, and into 2016. Because of these sustained low prices, U.S. demand for lumber and wood products during 2000 and into 2005 remained near record levels. But the current strengthening in the housing market has caused an uptick in the price levels and has fueled the current resurgence in lumber and wood products demand. In contrast, the PPI in the pulp and paper sector has exhibited considerably less short-term volatility. In deflated terms, the composite index began 2008 with a flat to declining trend, before undergoing an upturn in 3rd quarter 2008 that became flat in 1st quarter 2009 before fluctuating throughout 2013, increasing in 2014, and then declining into 2015.

Energy Policy Initiatives

Wood Energy

The wood energy market in the United States is composed of four major sectors: industrial (68%), residential (20%), electricity generation (9%), and commercial (3%). The industrial sector represents wood products and the pulp and paper industry; the amount of wood energy it consumes has been mainly linked to wood product output rather than public policy. In the other three sectors, public policy has been focused at the state and federal level. Historically, public policy has been focused on promoting the use of biomass for electricity, but in recent years, there has been a shift to greater support for liquid fuels for transport.

The most effective federal incentives introduced since 2004 according to recent publications appear to be (a) the renewable energy production tax credits, (b) clean renewable energy bonds, (c) qualified energy conservation bonds, (d) investment tax credits (Aguilar and others 2011). All of these incentives are tailored to the electricity generation sector. Recent publications also suggest that the eligibility of open-loop biomass plants (that is, not relying on bioenergy-dedicated crops but instead on material harvested from working forests and industry coproducts) for renewable energy production tax credits have favored greater use of woody materials, especially in the electricity sector.

Biomass Crop Assistance Program (BCAP) implementation guidelines (section 9.4.1.2) have been recently updated. BCAP, a policy established to help meet U.S. federal renewable fuel standards, mandates increased national biofuel use

to reach 36 billion gallons (136.3 GL) a year by 2022, with 21 billion gallons (79.5 GL) per year from advanced biofuels (Energy Independence and Security Act 2007) (1 billion = 10⁹).

Wood pellet manufacturing is the most dynamic wood energy sector in the United States because of increases in capacity and production of industrial pellets for export in the European Union (EU). EU bioenergy demand and supply are influenced by policies that seek to ensure use of biomass for real greenhouse gas (GHG) emission reductions and do not imperil the sustainability of bioenergy feedstock. U.S. export capacity has increased from less than 100,000 metric tons in 2008 to more than 3 million metric tons in 2015 coming from the newly operating regional pellet plants in the U.S. Gulf Coast region, according to the North American Wood Fiber Review (NAWFR 2015).

North American overseas pellet exports declined in 1st quarter 2015, falling 14% from the previous quarter to 1.2 million metric tons, but rebounded in the 4th quarter. In the United States, pellet exports to Europe, which had been growing in volume increases for 12 consecutive quarters, declined 15% to 875,000 metric tons in 1st quarter 2015 (NAWFR 2015).

The Pellet Fuels Institute was created as a North American trade association to promote energy independence through the efficient use of densified biomass fuel.

It has become clear that falling oil prices have affected the forest products and bioenergy sector, because a number of pulp mills are returning to the use of less expensive natural gas instead of woody biomass, slowing the use of that material. Decreased diesel prices for harvest and transportation resulting in lower delivered wood costs is a positive result from the drop in fossil fuel prices.

Biomass Energy

The renewed growth in the world economy has had a significant impact on wood and energy demand, and the near-term future of U.S. wood and energy markets are tied to the U.S. domestic upturn from the recession that started in 2008. There is growing concern about GHG emissions along with their effect on climate change, and this in turn has had an effect on energy investment decisions such as the increased use of renewable fuels, the increased production of unconventional natural gas, the shift in transportation fleets to more efficient vehicles, and improved efficiency in end-use appliances. The continued improvement of the world's financial markets is especially important for the wood and energy supply outlook, because the capital-intensive nature of most large projects makes access to financing a critical necessity.

Although the electricity sector has been a major beneficiary of federal public policy support, it has recently been facing increased scrutiny because of GHG emissions.

Debate is ongoing as to whether power generation using woody feedstock is considered a GHG carbon-neutral option. On January 12, 2011, the U.S. Environmental Protection Agency (EPA) announced its plan to defer for 3 years the requirement for GHG permits for CO₂ emissions from biomass-fired and other biogenic sources (EPA 2011a). Since the deferral in 2011, electricity and heat production account for 25% of GHG emissions, industry for 21%, agriculture, forestry, and other land use for 24%, transportation for 14%, building for 6%, and other energy for 10%. These are percentages of the 2010 GHG emissions (IPCC 2014).

The EPA has been developing guidelines to restrict emissions from certain stationary sources, such as electric power plants. The EPA has suggested that emissions from biomass might be treated on the same terms as emissions from fossil fuels. At the same time, it recognized the uncertainty about the carbon offset benefits of wood and other biomass sources (EPA 2010). Biogenic CO₂ emissions being reviewed include diverse sources such as those derived from combustion of biological material, including all types of wood and wood coproducts, forest residues, and agricultural material (EPA 2011b).

The U.S. Energy Information Administration's short-term Energy Outlook (EIA 2015) predicts that total renewables used in the electric power generation sector will decrease by 2.6% in 2015. Across all sectors, the United States is expected to consume 2.005 quad of wood biomass in 2015, down from 2.214 quad in 2014. Consumption is expected to fall to 1.933 quad in 2016. Across all sectors, the United States is also expected to consume 0.498 quad of waste biomass in 2015, up from 0.488 quad in 2014. In 2016, consumption of waste biomass is expected to increase to 0.508 quad.

Softwood Lumber Agreement

On October 12th 2015, the Softwood Lumber Agreement (SLA) ended except for a clause prohibiting the filing of a new trade case for 1 year. An immediate renewal of the agreement does not seem to be in the works. Without a renewal, Canadians have at least 1 year of unfettered access to the U.S. lumber market. In North America, U.S. mills continue to outperform Canadian mills in overall earnings, which has been occurring since 2008 and for which managed trade under the SLA appears to be a key factor. Sawmills in the U.S. West performed well in 2014 and 2015, but earnings were lower than in the U.S. South and were more similar to the earning results achieved by Canadian mills (Spelter 2015).

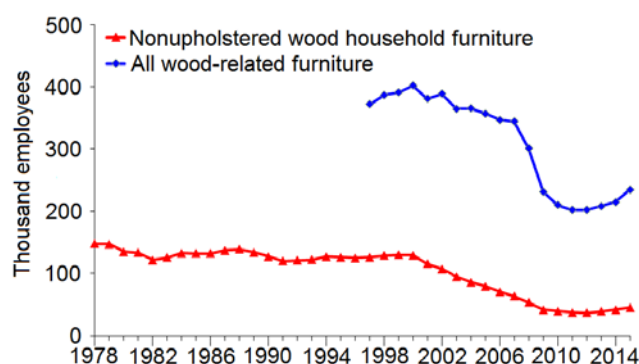


Figure 3. Employment in the wood furniture industries, 1978–2015.

Summary of Timber Products and Energy Policy

The past year (2015) has been less volatile for the U.S. wood and energy markets, with oil prices rising throughout 2014 before declining in 2015. Those markets became more stable into 2014 and 2015 with wood markets gaining strength. Economic activity in the United States improved in 2015 and has shown strength during the first two quarters of 2015 as evidenced by the increase in real GDP growth to 2.3% in 2nd quarter 2015, signaling renewed strength in major sectors of the economy. With stronger GDP growth during the first half of 2015, resulting partly from continued improvement in the housing sector as reflected in the rise in building permits, increasing employment, and renewed confidence about the financial system, there is increased enthusiasm and expectations for better economic conditions into 2016. Also, with more new home purchases instead of home refinancing and stronger GDP growth, which is an indicator of employment growth, the recovery of the U.S. economy seems on track. The current inflationary pressures remain in check and unemployment is falling, leading to higher expectations for the U.S. economy. The future strength for other domestic and foreign trade sectors of the wood products industry also depends on the general economy, future lumber prices (which were stronger in 2015), the improving housing sector, and the value of the dollar. In 2014, U.S. timber exports to China were strong but fell during the last half of 2014 into 2015. The future strength of the U.S. trade sector is also buoyed by surging exports to Mexico. If the surge in exports to Mexico is sustained and if the housing market continues to rebound throughout 2015, 2016 could be a good year for the U.S. wood industry.

The U.S. furniture industry, in retreat since 1999, continued declining in 2011 as low-cost furniture imports and the global economic recession continued to erode the domestic industry market share. Employment in the domestic furniture industry has fallen more than 50% since 1999 (Fig. 3). The U.S. furniture industry stabilized in 2012 and has shown continued strength into 2015 with production growing about 2.9% at an annual rate.

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