

United States Forest Products

Annual Market Review

and Prospects, 2015-2019

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Abstract

This paper describes the current state and near term prospective of the United States 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 2017 with estimates for 2018 and forecasts for 2019.

Keywords: production, trade, prices, forest products

Executive Summary

Economic activity in the U.S. remained very robust over the first three quarters of 2018 as the economy continued to expand. The outlook for growth into 2019 is strong but also basically unchanged from 2018. This outlook is confirmed by the increase in the estimated annual rate of real gross domestic product (GDP) to 2.8% in 2018 up from the previously expected 2.6%. Economic activity during 2019 is projected to remain flat but grow at an annual rate of 2.8%. The rate of growth in the U.S. economy will likely remain flat in the first half of 2019 then increase slightly in the second half of 2019 as predicted by 38 forecasters surveyed by the Federal Reserve Bank of Philadelphia (FRB) (AUG 2018). The flat rate of growth in the U.S. economy predicted for 2018 is consistent with the growth in the forest sector as exports for the U.S. economy to China and Europe have increased. The indications are that global trade is increasing; but the prospects of exports buoying the U.S. economy in the coming months are dim as tariffs on exports to China could hinder economic growth. Growth in U.S. real output looks strong but inflation rising over the near term compared to previous estimates. Forecasters expect the labor market to remain nearly unchanged to slightly lower in 2018 and 2019, measured on an annual-average basis. Unemployment is expected to average 3.9% in 2018 and 3.6% in 2019. While unemployment remains at a low 3.9%, continuing to indicate full employment, the growing but still relatively weak hourly earnings indicate there remains some room in the US job market to support growth. The unemployment rate was 8.1% at the beginning of 2012 because

many unemployed stopped looking for work and the unemployment rate have declined on average a full percentage point each year since. The forecasters see prices unchanged in the fourth quarter of 2018 which is a slightly lower rate than previously expected, and then increasing slightly in the 1st and 2nd quarter of 2019 as measured by the Core Consumers Price Index (CPI). Housing starts in 2018 continued to be stronger than in 2017 on average through May, according to the US Census, but slowed significantly in June and July. Total housing starts reached 1.168 million units (SAAR) in July, up 0.9% from June's revised 1.158 million. On an annual basis, starts were down 1.4% from a year ago. Single-family starts were 0.9% higher than in June, while the highly volatile multifamily sector registered an increase of 3.1%. Total housing permits hit 1.311 million units (SAAR) in July, up 1.5% from the prior month and 4.2% higher than July 2017. The ongoing relative slowness in existing home sales has been, in large part, attributed to the limited inventory of homes for sale, especially at the lower end of the market, and to the tightness in the market due to increasing prices, which continue to restrict access to the market. Rising interest rates will add their contribution to the apparent slowness of the housing market, even though the economy is doing well.

The growth in the housing sector continued to have a positive effect on softwood lumber consumption in 2018. According to the Western Wood Products Association (WWPA 2018), during the first 6 months of 2018, softwood lumber consumption increased 2.0% from the same period in 2017, and shipments of softwood lumber from western mills increased 6.3% during the first 6 months of 2018 compared with the same period in 2017. During the first 6 months of 2018 the Western region produced and shipped softwood lumber above the production and shipment levels in the Southern region.

Total structural panel production increased 2.9 percent over the two quarters of 2018 when compared to the same time period in 2017. Structural panel consumption over the first two quarters in 2018 increased 1.2 million cubic meters when compared to the same time period of a year ago representing a 8.9 percent increase from 2017 (APA July 2018).

Roundwood production for pulp and wood-based panel mills was 143 million cubic meters in 2017 down slightly from 2016. It is forecast that roundwood pulpwood consumption will increase during 2018. Pulpwood supplied from residues could continue to increase in 2018 relative to Roundwood due to and increased housing construction and wood products industry. It is also possible that supply from residues could increase with increased competition for residues to produce pellets or biomass for power.

U.S. softwood lumber and log exports to China have followed a similar pattern, increasing throughout the first 6 months of 2018. U.S. timber product exports to China have increased when compared to the previous year. Softwood lumber exports to China over the first 6 months of 2018 were 34.6 percent above the 2017 and log exports to China was 27.1 percent compared to a year ago (WWPA Sept, 2018).

U.S. furniture production has essentially been flat since 2015. While the US furniture market has been expanding, domestic furniture producers have been losing market share as US furniture imports have grown to meet the increased demand. Production started 2017 very strong but faded throughout the year. January 2018 after revision now shows only a 2.1% drop from the January 2017 level.

General Economic and Major Market Trends

According to 38 forecasters surveyed by the Federal Reserve Bank of Philadelphia (FRB 2018) the U.S. economy grew during the 2nd and 3rd quarter of 2018 more than during the 1st quarter and the expectations of continued growth into 2019 are good. The forecasters expect real gross domestic product (GDP) to grow at an annual rate of 3.0% in 2018. The continued optimism about the labor market accompanies the outlook for stronger output growth. Average unemployment is forecasted to be 3.9% in 2018. The 38 forecasters expect unemployment to improve to 3.6% in 2019. This decline in unemployment equates to nonfarm payroll employment growing at a rate of 197,000 jobs per month during the third quarter 2018 and 173,300 jobs per month during the fourth quarter 2018. On an annual-average basis, the forecasters expect job gains of 194,800 per month in 2018 and 167,800 per month in 2019. 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 1930's Great Depression. Almost every sector experienced job cuts: construction lost 2 million jobs, financial services lost 800,000 jobs and the auto sector where thousands of jobs were lost. 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 maintained over the next in 2 years.

Core inflation, as measured by the Price Index for personal consumption expenditures, is expected to average 2.0% in 2018 then increase to 2.1% into 2019. On an annual-average over annual-average basis, inflation in the core consumer Price index is projected to remain around 2.3% in 2018 then increasing to 2.4% in 2019 (FRB 2018).

New housing construction held steady during the 3th quarter of 2018 when 1,168,000 units were started in July at a seasonally adjusted annual rate (NAHB 2018). The construction level in July was due to steady single and multi-family starts. For the 3th quarter Single family starts averaged an annual rate of 862,000 units, up .9 % from June. Multifamily starts in the 3rd quarter averaged an annual rate of 306,000 units in July basically unchanged from June. July was driven by an 19.6% drop in starts in the West. Starts in the South were up 10.4% in July. Builders remain upbeat because on a 4 month moving average basis there was an upward trend indicative of the strength in demand for rental housing. The authorization of multifamily permits was up in July, the increase occurred entirely in the West and South, where they were up 4.9% and 1.9% respectively from June. Otherwise, the number of permits were unchanged or down slightly in the other region of the U.S. New single-family units completed decreased slightly in July falling to 814,000 from June when 859,000 units were completed. Total housing starts for 2018 is forecast to grow to 1,330,000 units up 10.5% from 2017 and the expectations for 2019 are for continued improvement.

In July 2018, the annual rate for total value of all new construction in the U.S. was \$1,315 billion, \$72 billion above the annual July 2017 value of \$1,243 billion (NAHB 2018). When comparing 2018 to 2017 month over month the seasonally adjusted annual rate for the total value of new construction it was above the 2017 annual rate for each month through July in 2018. Residential construction was \$560 billion in July 2018, \$38 billion above the \$522 billion annual rate of residential construction in 2017. Nonresidential construction accounts for approximately 25 to 35 percent of all construction value in the U.S. It too was affected by the distant economic

recession but not so 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.) The construction of buildings, which are the largest market for wood in nonresidential construction, in 2018 was at an annual rate in January of \$310 billion, up from 2017. The highest rate ever achieved was in 2008 when the construction of nonresidential buildings was nearly \$409 billion. The National Association of Home Builders 2018 forecast calls for the housing sector to improve in the 3rd and 4th quarter and starts and sales overall for 2018 will end the year above 2017 levels (NAHB 2018).

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 products markets. The United States is a world leader in the consumption of paper and paperboard (about 71 million metric tons in 2018), which is mostly supplied by domestic production and imports from Canada (AF&PA 2018). Domestic paper and paperboard production for the first 7 months of 2018 was about 1.7% above the production for the first 7 months of 2017. 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 77 million cubic meters of lumber and 21 million cubic meters of structural panel products in 2017. For the first 6 months of 2018 softwood lumber production was 5.1% above 2017 production and for all of 2017, structural panel consumption was 3.9% above 2016 levels. The U.S. forest products industry's annual harvest was 446 million cubic meters in 2015, exceeding the 450 million cubic meters harvested in 2017. Domestic roundwood timber harvest in 2018 that supports domestic consumption is expected to be above the 2017 harvest level.

Table 1—Selected U.S. economic indicators, 2015–2019.

Indicator	Actual ^a			Estimate ^b	Forecast ^c
	2015	2016	2017	2018	2019
Gross domestic product (billion 2009 dollars)	16,349	16,400	16,701	17,500	18,000
New housing starts (million units)	1.112	1.1	1.133	1.285	1.311
Mobile home shipments (thousand units)	71	81	93	95	98
Total residential fixed investment (billion 2009 dollars)	530	507	515	530	540
Total nonresidential fixed investment (billion 2009 dollars)	2,224	2,210	2,314	2,400	2,450
Total industrial production (Index: 2012=100)	99.9	105.2	107.6	110.2	112.3
Furniture and related products (Index: 2009 = 100)	116.9	115.4	117.5	119.0	121.0
Paper products (Index: 2009 = 100)	103.3	100.7	100.5	98.0	96.0

Sources:

^aBoard of Governors of the Federal Reserve System. 2018, Council of Economic Advisors 2018. National Association of Home Builders. 2018, U.S. Department of Commerce, Bureau of the Census. 2018

^bForest Service estimates based on 2017 actual data and preliminary 2018 data.

^cNational Association of Home Builders. 2018, Federal Reserve Bank of Philadelphia. 2018, and Forest Service estimates.

Expenditures for residential repair and remodeling increased in 2017 and is projected to increase in 2018 to \$158.8 billion (2005 dollars) up 6.6% from one year ago and well below the record high years of 2006 and 2007. In 2007 the U.S. Department of Commerce stopped collecting residential repair and remodeling data. The estimates for 2018 and 2019 presented here are Forest Service estimates based on private residential construction expenditures. The National Association of Home Builders Remodeling Market Index (RMI) increased to 60.0 in the 4th quarter 2017 with home maintenance and repair at 61. This index level is above the record level in 2004 prior to the housing market crash. During this same period new residential construction exhibited strength and continues to do so into the 3rd quarter 2018. Expenditures for maintenance and repairs to all existing residential properties have averaged about 33% of total expenditures, with the remaining 67% for improvements. Expectations are for continued investments in existing residential properties as low mortgage rates keep new home buying attractive.

The three major indicators of demand for wood products—furniture and related products, paper products output, and total industrial production—were mixed during the first 6 months of 2018 relative to 2017.

- Industrial production, an important demand determinant for pallet lumber, containerboard, and some grades of paper, increased 3.6% during the first 6 months of 2018 when compared to the annual level for 2017.
- Furniture and related products output, a determinant of high-grade lumber production, was up 0.1% during the first 6 months of 2018.
- Paper products output, a determinant of pulpwood and wood residue use, as well as recycled fiber availability and use, decreased during the first 6 months of 2018 compared with the 2017 average. The index (2012 = 100) of paper products output for the first 6 months of 2018 was 1.1% below the 2017 average for the comparable time period.

In summary, the housing sector continued to strengthen during the first 2 quarters of 2018 but weakened somewhat in the 3rd quarter of 2018. This strength is expected to continue into 2019. Housing starts in 2018 will probably exceed year-ago levels. With the increasing rate of growth in GDP 2018 the full year of 2018 is projected to be a good year overall as noted by the growth in timber markets. Selected U.S. economic indicators are shown in Table 1.

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 cubic meters. Data for 2017 are preliminary estimates, data for 2018 are forecasts.

Table 2—Prospects and statistics for wood and wood products, 2016-2018^a

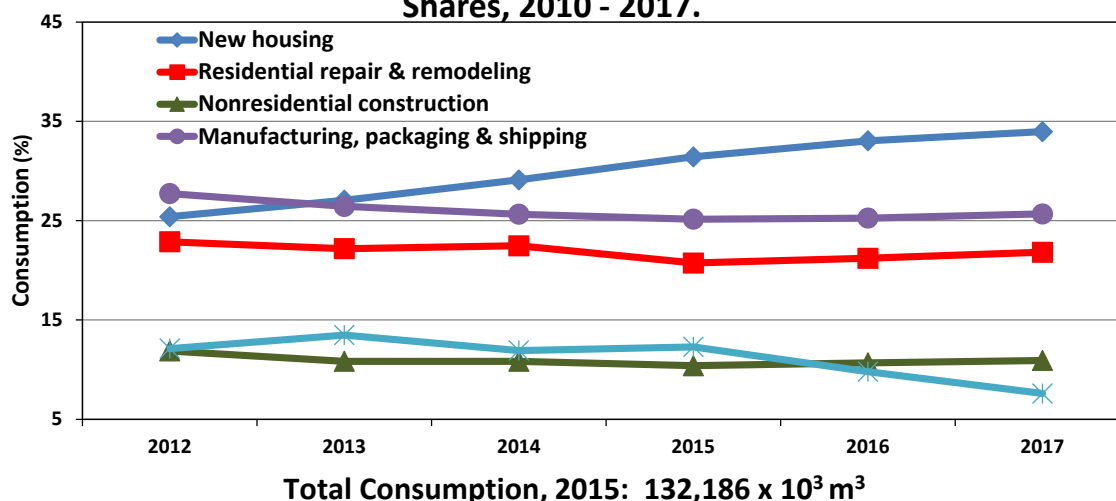
Sawn softwood				Oriented strandboard (OSB)			
	2016	2017	2018		2016	2017	2018
Production	53,804	57,600	58,401	Production	12,321	12,930	13,000
Imports	38,522	37,061	38,000	Imports	5,068	5,000	5,500
Exports	3,781	4,012	4,100	Exports	224	164	236
Consumption	88,545	90,649	92,301	n	17,165	17,766	18,264
Coniferous logs				Particleboard			
	2016	2017	2018		2016	2017	2018
Production	149,751	155,911	158,661	Production	4,370	4,450	4,465
Imports	525	530	540	Imports	608	622	651
Exports	8,304	8,350	8,565	Exports	290	304	333
Consumption	141,972	148,091	150,636	n	4,688	4,768	4,783
Sawn hardwood				Medium density fiberboard (MDF)			
	2016	2017	2018		2016	2017	2018
Production	19,597	19,622	19,990	Production	3,001	3,226	3,333
Imports	961	836	944	Imports	119	110	136
Exports	1,888	1,888	2,000	Exports	265	209	250
Consumption	18,670	18,570	18,934	n	2,855	3,127	3,219
Hardwood logs				Insulation board			
	2016	2017	2018		2016	2017	2018
Production	30,667	41,231	42,000	Production	2,755	2,755	2,755
Imports	1,575	1,625	1,625 #	Imports	150	177	177
Exports	3,900	3,800	4,201	Exports	129	140	140
Consumption	28,342	39,056	39,424	n	2,776	2,792	2,792
Coniferous plywood				Roundwood pulpwood			
	2016	2017	2018		2016	2017	2018
Production	7,796	7,988	7,970	Production	149,437	151,116	152,000
Imports	1,224	1,749	1,660	Imports	533	533	533
Exports	543	581	590	Exports	446	446	446
Consumption	8,477	9,156	9,040	n	149,524	151,203	152,087
Non-coniferous plywood				Hardboard			
	2016	2017	2018		2016	2017	2018
Production	1,602	1,602	1,602	Production	390	400	425
Imports	2,260	2,270	2,300	Imports	248	308	325
Exports	227	235	255	Exports	545	520	540
Consumption	3,635	3,637	3,647	n	93	188	210

^aAll volumes are reported in 1,000 cubic meters. Figures for 2016 and 2017 are actuals and Forest Service linear extrapolated estimates, 2018 are Forest Service linear extrapolated forecasts.

[†]Revised.

U.S. Wood Product Market Shares

Figure 1 - Solidwood Timber Products Consumption Market Shares, 2010 - 2017.



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 over time (Howard 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 & 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 percent 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 developed. These estimates provide a consistent, reliable look at solid wood products markets in the U.S. (McKeever and Howard 2011).

Table 3 presents annual balanced wood products consumption by end use for sawn wood, structural panels, and nonstructural 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 2018 but showed weakness into the 3rd quarter 2018. The housing market is likely to finish the year at a higher level than recorded a year ago. 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 6 months of 2018, softwood lumber consumption increased 2.0% from the same period last year, and shipments of softwood lumber from western mills also increased 2.1% during the first 6 months of 2018 compared with the

same period in 2017 (WWPA 2018). Production increased during this period in the South 3.5%. Apparent consumption for the first 6 months of 2018 was 57.5 million cubic meters, 2.0% above the 56.4 million cubic meters for the first 6 months of 2017. As predicted, the U.S. housing construction industry grew over the 1st half of 2018. Timber production as a result of a strengthening domestic market continued to increase in 2018 slightly above the 2017 timber growth level. Production of sawn softwood for 2018 is forecast to exceed 2017 levels, and then continue to rebound with a gradual increase in 2019.

Sawn softwood imports decreased 2.7% during the first 6 months of 2018 relative to the same time period a year ago. The volume of Canadian imports, which constituted 98% of all sawn softwood imports, decreased by 6.0% over this period. Total sawn softwood imports were 36.5 million cubic meters in 2017.

During the first 6 months of 2018, U.S. sawn softwood exports increased 13.3% compared with exports for the same period in 2017. Exports to Canada increased by 22.1%, while exports to China increased 34.6 % and exports to Mexico decreased 15.0%.

Sawn Hardwood

Sawn hardwood production is expected to decrease to 19.0 million cubic meters in 2018. Imports in 2018 are expected to decrease from one year earlier. Given the decrease in U.S. production and imports and despite a strengthening housing market, apparent consumption for 2018 is forecast to fall below the 2017 volume.

Softwood Log Trade

Softwood log exports to China increased over the first 6 months of 2018 when compared with exports in the same period of 2017 increasing by 27.1%. Softwood log exports to Canada decreased by 21.8% in the same period. Softwood log exports to all other countries increased by 7.7% during the first 6 months of 2018 when compared with the same time period of one year ago. Most of the U.S. export increase has been centered in Asia. Overall, the volume of U.S. logs shipped to China increased by 549,700 cubic meters in 2018 about 51% of the region's total log production. Softwood log imports decreased by 23.8% over the first 6 months of 2018 compared with a year earlier. During 2017, the timber harvest surpassed the 2016 harvest and the forecast calls for a further rise in harvest in 2018.

Hardwood Log Trade

Hardwood log exports increased by 2.5% and imports rose by 0.5% during 2017 compared with 2016. Canada traditionally provides about 95% of U.S. imports. The trend in hardwood log exports was up from a year ago through the first 6 months of 2018. Hardwood log imports were also up slightly through the first 6 months of 2018 when compared to 2017.

Pulpwood

Roundwood production for pulp and wood-based panel mills was 120 million cubic meters in 2017, down slightly from 2016. Roundwood pulpwood consumption is expected to increase during 2018 as indicated by a 1.7 % increase in paper and paperboard production over the first 6 months of 2018. Pulpwood supplied from residues continued to decrease relative to roundwood. This is a result of declining residual production and competition for residuals for pellets and biomass and not out of preference on the part of pulp producers. The residue portion of pulpwood was 85.0 million cubic meters in 2017, down slightly from 2016 (Howard 2015). 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 due to a downturn in consumer spending associated with the United States and global recession. Exports of paper, paperboard, and converted products increased by 5.0% to 11.1 million metric tons, while imports of paper and paperboard decreased by 0.5% to 9.4 million metric tons in 2017 compared to 2016. Paper and paperboard production increased by 1.0 % in 2017 to 71.1 million metric tons. The production of paper and paperboard in 2018 is forecast to be down from 2017 production as reflected in the annual year to date rate for July 2018 of 41.1 million metric tons, which is down 1.7% from 2016 when paper and paperboard was produced at a level of 41.3 million metric tons.

Structural Panels

Structural panel production in 2017 increased from 2016, while consumption in 2017 was 6.4% above consumption in 2016 (APA 2018). Structural panel production during the first 2 quarters of 2018 was 11.9 million cubic meters which is 8.9 percent above the first 2 quarters of 2017. Structural panel market shares move in the same direction as any economic upturn. New residential construction which, in 2006, captured 46% of all structural panel consumption, fell to 35% in 2011, but has rebounded and continue increasing in 2018 (Table 3)

In 2017, 12.9 million cubic meters of oriented strandboard (OSB) were produced (APA 2018) (Table 2). OSB consumption totaled 18.4 million cubic meters in 2017 and constituted 60% of the structural panel market (Table 3). This represented a 4% share increase from 2008. Consumption is expected to further increase in 2018. OSB consumption increased 8.9 percent over the first two quarters of 2018. The continuing economic growth and growing residential construction sector is expected to increased OSB consumption in 2018 to 19.0 million cubic meters.

Softwood plywood production was 7.9 million cubic meters in 2017 (Table 2) (APA 2018). This level of production was above 2016 the first increase in four years. The volume of softwood plywood production fell throughout the 1990s, and the decline continued into 2012 before improving in 2013 before declining in 2014. Softwood plywood imports increased in 2017 by 42.0% compared with 2016 data, while softwood plywood exports in 2017 increased by 6.9% compared to that of 2016. Plywood exports to Canada increased by 13.5% during the first 2 quarters in 2017 compared with a year earlier, and plywood imports from Canada increased 16.5%. Softwood plywood consumption was 14.4 million cubic meters at the end of the 2nd quarter 2018 which was 8.9% above last year. Apparent consumption of softwood plywood increased 6.4% in 2017 compared to 2016.

Hardwood Plywood

Hardwood plywood production, including core material such as particleboard and medium density fiberboard, was estimated at 1.8 million cubic meters in 2017, up slightly from 2016 production. Hardwood plywood imports decreased 5.7% in 2017 falling to 2.9 million cubic meters when compared to 2016. Hardwood plywood exports rose in 2017, increasing 2.3% to 179 thousand cubic meters. Production and consumption of hardwood plywood in 2018 and 2019 is forecasted to steadily rise (Table 2). These increases are a result of rising Total Industrial Production and Furniture and Related Products production (Table 1), coupled with the U.S. housing market rebound.

Particleboard and Medium Density Fiberboard

Information from the Composite Panel Association (CPA 2018) indicates that both particleboard and medium density fiberboard (MDF) production decreased in 2017 compared to 2016. Particleboard production was 3.9 million cubic meters, a decrease of 3.8%; MDF production was 3.0 million cubic meters, an decrease of 2.5% (Table 2). Both imports and exports of particleboard and MDF increased in 2017 over 2016, resulting in decreased total consumption in 2017 when compared to 2016. Particleboard and MDF account for well over one-half of all nonstructural panels consumed in the U.S., being used principally for furniture, fixtures, millwork and other manufactured products. Markets for particleboard and MDF are expected to increase modestly in 2018 (Table 3).

Hardboard

Based on data from the Composite Panel Association (CPA 2017), 796 thousand cubic meters of hardboard were produced in 2017 in the U.S and Canada; this level of production is expected to increase slightly in 2018. Hardboard imports and exports are expected to remain flat over the next two years.

Insulation Board

Information from the American Forest & Paper Association (AF&PA 2015) showed that 2.7 million cubic meters of insulation board was produced in 2017, unchanged from 2016. Production of insulation board has been flat for several years, resulting in a stable level of apparent annual consumption of about 3.0 million cubic meters.

Table 3.--Wood product market shares in the U.S, by end use, 2012 - 2017

Year ^a	Residential construction														Pack-aging & shipping	Total, reported use	Other
	New housing				Repair & remodeling	Nonresidential construction			Total construction	Manufacturing							
	New single family	New multi-family	Manu-factured housing	Total		Build-ings	Other	Total		Furni-ture	Other mfg						
					Total												
Sawn softwood ^b																	
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	
2017	30	7	1	38	27	65	7	2	9	74	3	5	8	9	91	9	
Sawn hardwood																	
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	
2017	4	1	0	5	6	11	4	10	14	25	10	10	20	44	89	11	
Total sawnwood																	
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	23	5	1	29	22	51	6	3	9	61	4	6	10	15	86	14	
2016	24	6	1	31	22	54	6	3	10	63	4	6	10	15	88	12	
2017	25	6	1	32	23	56	6	3	10	66	4	6	10	15	91	9	
Coniferous plywood																	
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	
2017	15	3	0	18	30	48	17	3	20	68	5	17	21	8	97	3	
Oriented strandboard (OSB)																	
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	
2017	52	8	3	63	17	80	12	2	15	95	0	0	1	3	99	1	
Total, structural panels																	
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	38	6	2	47	20	67	13	2	16	82	2	6	8	5	95	5	
2016	39	6	2	48	21	69	14	3	16	85	2	6	8	5	97	3	
2017	40	6	2	49	21	69	14	3	16	86	2	6	7	5	98	2	
Nonstructural panels ^c																	
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	
2017	14	6	1	22	14	36	9	0	9	45	23	22	44	2	92	8	

^a2012 - 2015 revised, 2016 preliminary, 2017 forecast.

^bIncludes laminated veneer lumber.

^cIncludes particleboard, medium density fiberboard, insulation board, hardboard and non-coniferous plywood.

Fuelwood

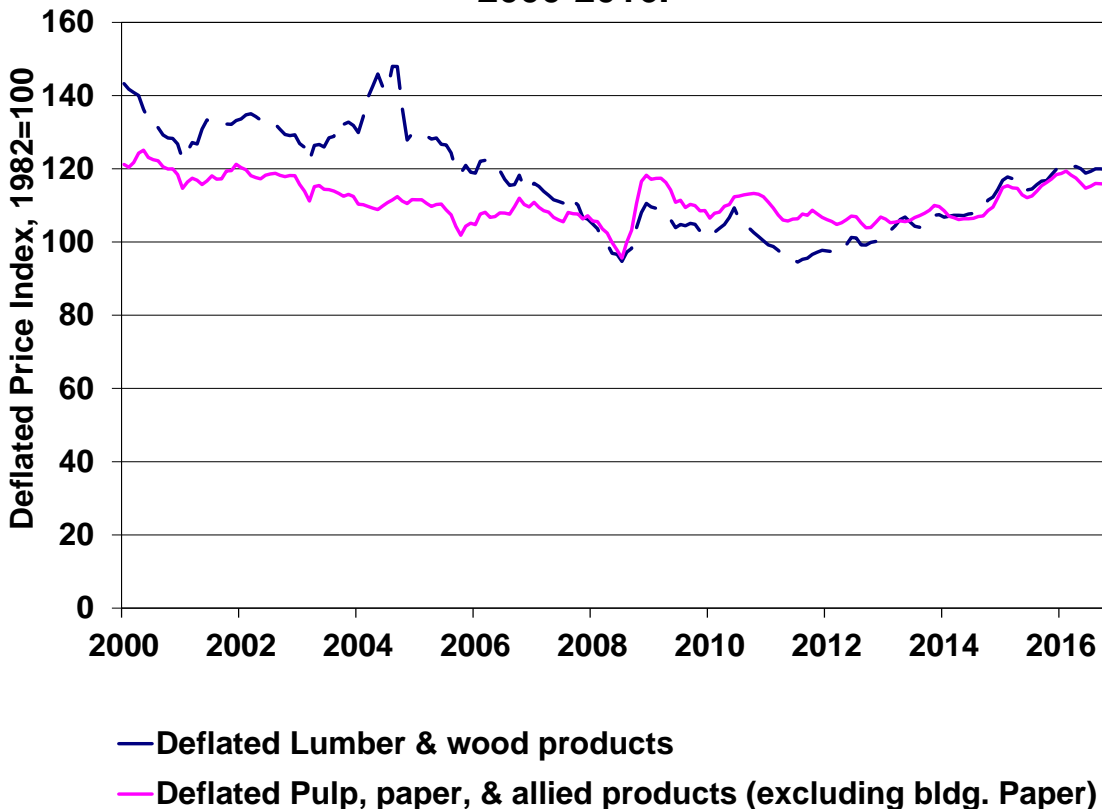
Using data from the 2017 Energy Information Administration report (EIA 2017) and adjusting for the 2017 winter weather and an increasing trend in fuelwood use per household, fuelwood consumption estimated to be 64.0 million cubic meters in 2017—a increase of 3.5% from 2016.

Households use most 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 electric power is limited by the low cost of coal and natural gas alternatives.

Fuelwood consumption for 2017 was above the level for 2016 and the forecast calls for increased fuelwood consumption through 2018. Renewable Fuel Standards and other biomass-related energy policies are unlikely to increase the growth rate for fuelwood production and consumption, but likely to increase other forms of wood energy use such as Pellets. The U.S. produced 8.0 million tonnes of wood pellets in 2017, of which about 42% was consumed domestically (UNECE/FAO, 2017).

Forest Products Prices

Figure 2 - Wholesale Prices of Forest Products, 2000-2016.



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 of lumber and wood products as reflected by the producer price index (PPI) continued to fluctuate around a level reached by the mid-1990s

before peaking during the second half of 1999 (USDL 2017). The PPI for lumber and wood products continued to decrease during the 1st quarter of 2008, but rose and peaked in the 3rd quarter, and then declined again in the 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 throughout 2000 and into 2011. The PPI for both lumber and pulp paper and allied products have been increasing since 2011, throughout 2017, and into 2018. 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 of prices 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 the third quarter of 2008 that became flat in the first quarter of 2009 before fluctuating throughout 2015 before increasing in 2016 and 2017. The first two quarters of 2018 lumber and paper and paperboard prices are have been steady to increasing.

Energy Policy Initiatives

Wood Energy

The wood energy market in the US is composed of four major sectors: industrial (68%), residential (20%), electricity (9%), and commercial (3%). The industrial sector represents the wood products, pulp and paper industry; and the amount of wood energy it consumes has been mainly linked to wood product output rather than public policies. The other three sectors have been where public policy is focused at the state and federal level. Historically, public policy was focused on promoting the use of biomass for electricity while, 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 et al., 2011). All of these incentives are tailored to the electricity generation sector. Recent publications also suggest that the eligibility of open-loop biomass plants (i.e. not relying on bioenergy dedicated crops, but instead on material harvested from working forest and industry co-products) for Renewable Energy production Tax Credits have favored the 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 US Federal Renewable Fuel Standards, mandates increased national biofuel use to reach 36 billion gallons a year by 2022, with 21 billion gallons per year from advanced biofuels (US Public Law 110-140).

Wood pellet manufacturing is the most dynamic wood energy sector in the US 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 energy results in real GHG emission reductions and do not imperil the sustainability of bioenergy feedstock. US export capacity has increased from less than 100,000 tonnes in 2008 to more than 3 million tonnes 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) www.woodprices.com. U.S. pellet exports increased for 3 consecutive quarters in 2017 from 1.1 million metric tonnes in the 2nd quarter to 1.5 million tonnes in the 4th quarter 2017. The US overseas pellet exports are nearly all flowing to Europe, principally to the UK from the US South industrial pellet sector. North American overseas pellet exports increased to a new quarterly high with Canada exports leading the way. In the 1st quarter of 2018 North American exported 1.80 million tonnes of pellets overseas. This is a 10 percent decrease from the record high of 2.0 million tonnes in the 4th quarter of 2017. A decrease in exports from North America to Asia, together with a decrease in US exports to Europe, was responsible for this decline (North American Wood Fiber Review September 2018).

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 pulpmills are returning to use of less expensive natural gas instead of woody biomass, slowing the utilization of that material. Reduced 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 with the near-term future of U.S. wood and energy markets tied to the United States domestic recovery from the recession that started in 2008. The growing concern about greenhouse gas (GHG) emissions along with their effect on climate change and its effect on energy investment decisions, the increasing use of renewable fuels, the increasing production of unconventional natural gas, the shift in the transportation fleet to more efficient vehicles, and improved efficiency in end-use appliances are the result of U.S. energy concerns. 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 Greenhouse Gas (GHG) emissions. Whether power generation using woody feedstock is considered a GHG carbon-neutral option is undergoing debate. On January 12, 2011, the US Environmental Protection Agency (EPA) announced its plan to defer for three years the requirement for GHG permits for CO₂ emissions from biomass-fired and other biogenic sources (EPA, 2011b). Since the deferral in 2011 Electricity and Heat Production is 25% of GHG emissions, Industry 21%, Agriculture, Forestry, and Other Land use is 24%, Transportation is 14%, Buildings 6% and Other Energy is 10%, each is a percent of the 2010 GHG emissions (IPCC 2014).

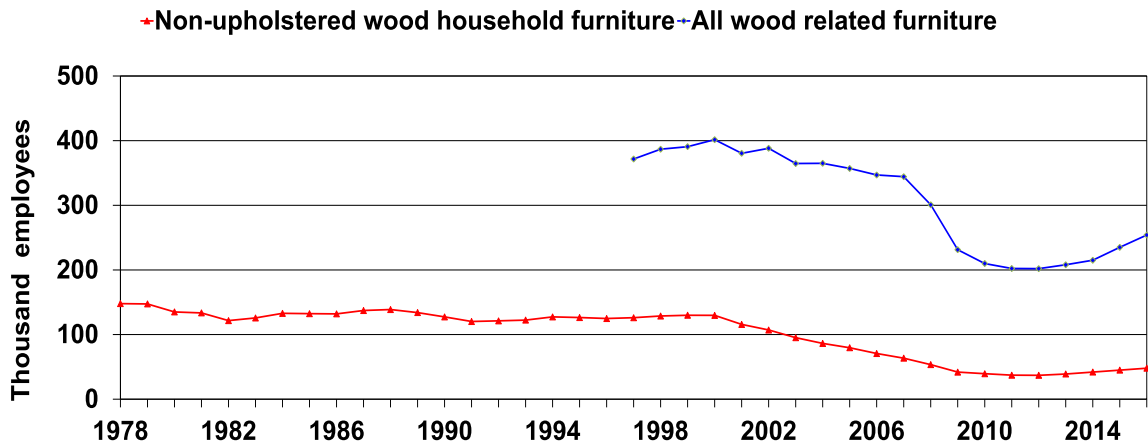
The EPA has been developing guidelines to restrict emissions from certain stationary sources, such as electric power plants. The EPA has suggested the possibility that emissions from biomass might be treated on the same terms as emissions from fossil fuels. At the same time it recognized the uncertainty 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 co-products, forest residues, and agricultural material (EPA, 2011a).

The U.S. Energy Information Administration has released the August edition of its short-term Energy Outlook, predicting total renewables used in the electric power generation sector will increase by 1.2 percent this year. Across all sectors, the U.S. is expected to consume 1.980 quad of wood biomass this year, down from 2.041 quad last year. Consumption is expected to fall to 1.998 quad in 2017. Across all sectors, the U.S. is also expected to consume 0.502 quad of waste biomass this year, up from 0.494 quad last year. In 2018, consumption of waste biomass is expected to increase to 0.750 quad.

Summary of Timber Products and Energy Policy

The U.S. economy continued strong showing strength during the first three quarters of 2018 as evidenced by the increase in real GDP growth of 3.0 % in the 3rd quarter 2018, signaling renewed strength in major sectors of the economy. With continued GDP growth during the first 3 quarters of 2018, resulting partly from the 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 to expect good economic conditions into 2019. 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 is steady but not robust. The current inflationary pressures are increasing and unemployment is falling, leading to higher expectations for the U.S. economy. The biggest near term impact from improving U.S. economic activity in 2018 is the fallout from rising bond rates resulting in the strengthening of the dollar, this could be a challenge U.S. manufacturers. 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 are stronger in 2018), the improving housing sector, and the value of the dollar. U.S. timber exports to China were strong in 2017 and is showing continued strength over the first 6 months of 2018. The future strength of the U.S. trade sector is also buoyed by surging exports to China and Japan. If the surge in exports to China and Japan is sustained and if the housing market continues to rebound throughout 2018, 2019 could be a good year for the U.S. wood industry. As the world works to replace fossil fuels, wood pellets are playing a key role in decarbonizing power grids. European nations, in particular, have invested heavily in pellets for both heating and electricity generation. To supply this increased demand, global trade in pellets has doubled since 2012 with the U.S. playing a key role.

Figure 3 - Employment in the Wood Furniture Industries, 1978 to 2016.



United States furniture industry, in retreat since 1999, continued declining in 2017 as low-cost

The

furniture imports and the global economic recession eroded the domestic industry market share. Employment in the domestic furniture industry has fallen more than 50% since 1999 (Fig. 3). Imports continue to penetrate the U.S. market. Upholstered furniture imports through June 2018 were up 10 percent from the first 6 months of 2017. Cabinet imports have also gained share in the U.S., which were up 22 percent through the first half of 2018 compared to the first half of 2017.

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Figure Captions

Figure 1—Solidwood timber products consumption market shares, 2000 - 2017.

Figure 2—Wholesale prices of forest products, 1999 - 2017.

Figure 3—Employment in the wood furniture industries, 1978 - 2017.