

# WOOD DEMAND REPORT

## SOUTH: GRADE CONSUMPTION INCREASES BUT STUMPAGE DIPS; PULPWOOD CONSUMPTION FLAT

### New this issue— Wood Demand Outlook

In this issue we introduce the **Wood Demand Outlook** to our Wood Demand Report. The Outlook is a result of our research on timber markets and utilizes statistical modeling and macroeconomic inputs from third-party sources. It addresses the question: *“What is a likely impact of GDP/Housing/Inflation or other factors on demand of timber products in my state?”* A short Outlook methodology, factors used in modeling, and the model’s historic fit are detailed on pages 6 and 7.

The Outlook is a work in progress. The model for each timber product will be revisited every quarter to confirm/re-estimate the best fit.

State-specific Wood Demand Outlook is a unique analytical product but we recognize its limitations as often procurement areas for many market participants do not fit within state boundaries. We are currently developing a research framework for a **market-specific Wood Demand Outlook**, typically capturing user-defined 80-100 mile radius wood procurement area (subject to strict demand data confidentiality). The market-specific Outlook will be able to better capture local demand dynamics and provide real-time demand analytics for private research and multi-client studies. For further information and pricing of this new product contact Dr. Tim Sydor.

### Macroeconomic Summary

**Economic growth** slowed in Q2 2012 following the downward revision of real GDP growth in Q1 to 1.7%. Expectation for the past quarter, according to the Consensus by Freddie and Fannie, is a strong 2.3%, but the preliminary reports indicate a much slower pace, in the 1.5-1.7% range. The economic growth outlook for the next four quarters forecast real annualized economic growth of 2.4-2.55% quarterly.

**Unemployment** remained largely flat during the quarter, at 8.2% and by year’s end only expected to decline to 8%. During the quarter the average monthly job growth was only about 1/3 of the job growth during Q1. Professional services, healthcare and manufacturing sectors added jobs during the quarter, but only professional services jobs growth broke 100,000 new jobs mark. The service sector, representing the largest portion of non-farm employment jobs, was flat during the quarter.

**Housing starts** were a somewhat bright spot for economic development during the last quarter. The starts reached 738,000 units s.a.a.r, beating analysts expectations by ~ 30,000 units. Analyst reports from last year suggested that housing, unlike after previous recessions, is likely to follow the current economic recovery. Some reports on economic recovery this quarter indicate that housing may return to its more “traditional” role of leading the economic recovery this time. At the same time Outlook Consensus forecasts a meager combined 5% housing starts growth over the next two quarters. Perhaps, as the saying goes “In the country of the blind, a one-eyed man is king”, and the one-eyed man in the current environment is housing.

### Region Summary

Pine grade demand during the first quarter increased 2.8% across the South, and unlike the previous quarter when the growth was mainly due to chip-n-saw, this quarter the demand growth was almost equally

split between sawtimber and chip-n-saw. Pine pulpwood and direct chips demand increased 1%, reversing the 1% decline during Q1. In a similar fashion, hardwood pulpwood and direct chips demand increased 1% during the last quarter.

### Wood Demand Index

The wood demand index for pine grade increased 0.71 on strong demand and was 4.3% higher than during Q2 2011. The index suggests that in Q2 2012 demand for pine grade across the South was 29% below the average quarterly demand during 2006. The pine grade index, again reached the highest point since Q4 2008, beating the number for Q1. Pine pulpwood and direct chips index increased 1% to 0.99 in the last quarter, the same level as in Q2 2011. The pine sawtimber stumpage index declined by 5% to the second lowest position on record. The pine pulpwood stumpage index declined 0.2% in the last quarter. Observed inconsistencies in demand increase and price decline by product in Q2 can be explained by 1) temporal lag in timber procurement (stumpage captured) and delivery (demand captured), and 2) increased available supply across the markets.

### Capacity Utilization by End-use

South-wide the capacity utilization ratio among pulp/paper facilities was 89%, the highest among the timber-using industries and 1% higher since last quarter. Pulp/paper facilities in FL, GA and SC sub-region had the highest effective capacity utilization, at 97%. Lumber mills in the South had 79% effective capacity utilization, with AL, LA and MS having the lowest ratio among the sub-regions at 73%. The ratio among plywood mills in the South was flat at 67%. OSB facilities increased capacity utilization by 6% to 63% in the last quarter.

### Looking Ahead

The economic outlook for the next 3 quarters appears to be quite optimistic, given recent performance. Both GDP growth and housing are expected to grow, on average 2.5% per quarter by the end of the year. Unemployment is not expected to fall below 8% this year. All price expectations, framing lumber, pulp, diesel and gas, based on current futures, are projected to decline over the next 3-4 quarters, likely indicating analyst’s expectation of a positive supply impact.

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# WOOD DEMAND REPORT

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Pine grade demand is expected to increase 3.9% by year's end, and hardwood grade by 7.9% due to projected housing starts growth and expected both unemployment and diesel price declines.

Pine pulpwood and direct chips and hardwood pulpwood and direct chips are projected to grow 9.8% and 4.7%, respectively. In light of a rather low fit of some of our pulpwood demand models we consider this result unlikely and treat these numbers as **guidance** on maximum possible demand response to macroeconomic changes. Other factors, such as running inventory, availability and prices of substitute raw materials and weather patterns across the region can impact demand for aggregate pine and hardwood pulpwood demand. Pulpwood demand by OSB facilities is projected to grow 2.4% by year's end in response to improving housing demand and inflation.

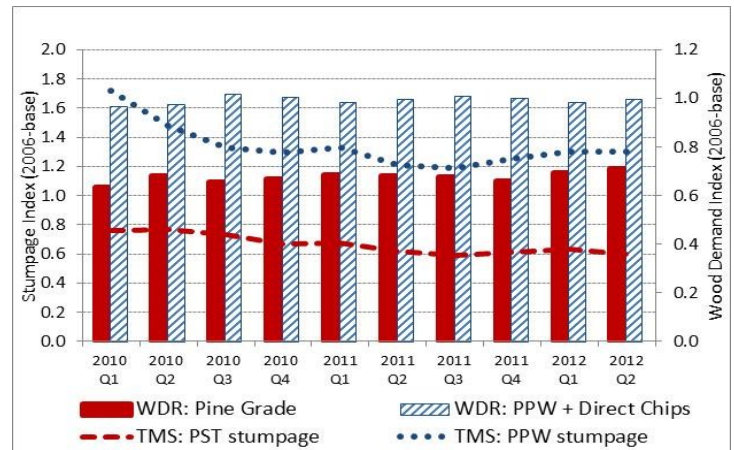
## WOOD DEMAND INDEX

The **Wood Demand Index** tracks changes in quarterly wood raw material receipts. The Demand Index is base-lined against average wood demand in 2006. The Stumpage Index is based on Timber Mart-South pine sawtimber and pine pulpwood stumpage prices. The Stumpage Index is base-lined against respective average stumpage prices in 2006.

- Pine Grade Demand Index increased to 0.71, beating the last quarters' index as the highest since Q4 2008. The increase in pine grade demand was split almost equally between pine sawtimber and pine chip-n-saw volumes.
- Pine Pulpwood and Direct Chips Index increased 1% from 0.98 to 0.99 in the last quarter. The increase in demand was almost equally split between roundwood and chips.
- Pine Sawtimber Stumpage Index declined to the second lowest level (and price) on record. In the absence of observed demand decline, we can attribute the price decline to increase in timber supply. Favorable weather (dry) conditions and low(er) energy prices may increase the available inventory or expand procurement area in effect increasing supply of timber.
- Pine Pulpwood stumpage Index declined slightly from the last quarter,

but still remained at the highest level since Q1 2011. Given a modest increase in demand for the product, the observed lower price indicates an increase in available supply across the Southern markets.

### Wood Demand Index: US South



## QUARTERLY EFFECTIVE CAPACITY UTILIZATION IN THE SOUTH

### About the Effective Capacity Utilization Ratio

Effective capacity utilization captures the ratio of actual raw material purchases in a quarter to the potential wood demand at full capacity. As such it is distinctly different from production-level capacity utilization ratio. As calculated, the effective capacity utilization may overstate actual utilization if the mill is building inventory. Conversely, if a mill produces end products mainly using existing inventory, the utilization will be under-estimated.

- Lumber/pallet capacity utilization increased 2.6% in the last quarter and reached 79%. Capacity utilization increased 3.4% at AR, OK, TX and AL, LA, MS sub-regions.
- Capacity utilization at plywood/veneer facilities remained generally flat (a small 0.1% increase) in the last quarter at 67%.
- Pulp and paper mills across the South increased capacity utilization 1% and reached 89%. The highest pulp/paper capacity utilization was in the AR, OK, TX sub-region, and a slight decline was captured in the FL, GA, SC sub-region.

- OSB facilities increased capacity utilization across the South 5.4% and reached 63%. The largest increases were observed in the NC, TN, VA sub-region. Capacity utilization declined in the FL, GA, SC sub-region.

### Effective capacity utilization, Q2 2012

Sub-region	Lumber/	Plywood	OSB/Panel	Pulp/paper
NC, TN, VA	87%	81%	86%	83%
AR, OK, TX	78%	72%	63%	81%
AL, LA, MS	73%	68%	39%	88%
FL, GA, SC	81%	55%	71%	97%
South	79%	67%	63%	89%

## MACROECONOMIC OUTLOOK

Macro Indicators—Source	Q4 2011	Q1 2012	Q2 2012	Q3 2012 <sup>1</sup>	Q4 2012	Q1 2013	Q2 2013	% change
GDP Growth, % —Freddie Mac		1.9	2.3	2.5	2.7	2.8	2.8	21.1%
GDP Growth, % —Fannie Mae		1.9	2.3	2.3	2.4	2.3	2.3	21.1%
Actual / CONSENSUS	3.1	1.7	2.3	2.4	2.55	2.55	2.55	35.3%
Unemployment, %—Freddie Mac		8.3	8.1	8.1	8	8.1	7.8	-2.4%
Unemployment, %—Fannie Mae		8.2	8.1	8.1	8	7.9	7.7	-1.2%
Actual / CONSENSUS	8.70	8.27	8.17	8.10	8.0	8.0	7.75	-1.2%
Housing Starts, '000—Freddie Mac		720	700	740	780	830	880	-2.8%
Housing Starts, '000—Fannie Mae		712	710	750	775	800	842	-0.3%
Actual / CONSENSUS	670	687	738	745	777.5	815	861	7.5%
End-product, Commodity Prices			July/Aug <sup>2</sup>		Nov	Jan/Mar		
RL Softwood Lumber, \$/MBf <sup>3</sup>		\$287.67	\$324.00	\$287.80	\$281.50	\$290.50	\$295.00	12.6%
Softwood Pulp (NBSK), \$/ metr.ton <sup>4</sup>		\$832.51	\$845.78	\$839.17	\$837.50			1.6%
Gulf Coast Gasoline, retail \$/gal. <sup>5</sup>	\$3.25	\$3.48	\$3.60	\$3.01	\$2.88	\$2.87	\$2.97	3.4%
Gulf Coast UL Sulfur Diesel, retail \$/gal <sup>5</sup>	\$3.78	\$3.89	\$3.86	\$3.36	\$3.32	\$3.32	\$3.26	-0.8%

<sup>1</sup> Blue fields indicates outlook or preliminary numbers; <sup>2</sup> CME contract dates, settle price as of 7/17/2012; <sup>3</sup> Source: Random Lengths. Used with permission granted by publisher; <sup>4</sup> Source: FOEX. PIX NBSKP Europe Index. Used with permission. <sup>5</sup> Source: EIA, futures—CME.

### Economic growth

According to economic consensus (see table above) the economy is expected to grow 2.3% in the Q2 2012, as measured by real GDP growth. Preliminary reports indicate that economic growth slowed further compared to Q1, and, we think will likely be within 1.5-1.7% range. The real economic growth in Q1 was revised 0.2% downward to 1.7%. Quarterly growth during the year is not expected to break the 3% mark according to the consensus, and IMF is projecting 2.1% average US GDP growth in 2012.

### Unemployment

The employment situation did not change significantly in the second quarter, with the unemployment rate declining slightly from 8.27% in Q1 to 8.17% in Q2. Employment growth averaged 75,000 per month in Q2, significantly below the 226,000 per month average job growth in Q1. Summer season is typically slow on employment growth, and this year is no different. The sectors that added the most jobs in Q2 were: professional business services (+107,000), health care (+65,000) and manufacturing (+39,000). At the same time, the construction sector lost 28,000 jobs in April. The service sector jobs, representing the bulk of non-farm employment, were flat during the last quarter.

The unemployment Outlook (Consensus) from Freddie and Fannie projects a slight decline in unemployment to 8% by the year's end.

### Housing Starts

Housing starts in the Q2 grew at an annualized rate of 738,000 units, a 7% increase from the first quarter. The quarter started with a strong growth in April at 744,000 units s.a.a.r, the highest rate since October 2008. In May, housing starts declined 4.4 % to 708,000 units s.a.a.r. In

June, preliminary reports indicate a strong 6.9% growth to 760,000 units s.a.a.r. Housing starts in Q2 beat analysts' expectations by almost 30,000 units. Housing permits, an indication of future construction, beat analyst's expectations and grew in May to 780,000 s.a.a.r, but declined to 755,000 s.a.a.r in June.

A recent report by the NAHB indicates a growing builders' confidence in the last quarter. The index that measures builders' confidence increased to 35 and generally resembles the PMI index. An index value above 50 would indicate an anticipated expansion by a majority of industry participants. At 35, the outlook is still gloomy, but a sharp increase in confidence suggests a positive and optimistic trend.

Random Lengths softwood framing lumber prices increased 12.6% in Q2 2012 since the previous quarter on strong housing starts and lumber demand. However, lumber futures indicate a substantial (11.2%) decline in July/August and a slight further decline in November closing dates. Framing lumber futures are expected to grow 3.2% by the Q1 2013. Despite strong housing starts, growth in Q2 and further growth for the rest of the year, lumber traders do not project lumber prices to increase substantially. This may be due to expectation of slower lumber demand from reduced expectations for housing starts growth, or increased lumber supply from mills ramping-up lumber production.

Pulp prices (NBSK Europe, softwood pulp) increased \$13.27/ton or 1.6 % in Q2 2012. Pulp price futures indicate a slow decline by the year's end and likely mirror the declining demand outlook for pulp and paper products.

Gulf Coast gasoline futures indicate decline in demand and are projected to fall through Q1 2013. Gulf Coast diesel futures are expected to decline next quarter and remain flat through Q1 2013.

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## PINE AND HARDWOOD GRADE PRODUCT WOOD DEMAND DATA BY MARKET

### Pine Grade Demand in Green Tons, Outlook and % Change, Q1 2012-Q2 2012

STATES	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	% change
AL	2,207,568	2,523,562	2,565,325	2,744,278	2,760,078	2,800,032	2,886,031	1.7%
AR	2,062,177	2,061,486	2,162,591	2,204,622	2,214,642	2,239,945	2,294,228	4.9%
FL	822,866	839,658	840,727	912,413	917,617	930,774	959,091	0.1%
GA	2,832,445	2,990,437	3,037,184	3,068,073	3,076,281	3,096,959	3,141,063	1.6%
LA	1,547,259	1,557,234	1,663,678	1,702,006	1,712,711	1,739,796	1,798,179	6.8%
MS	2,089,850	2,082,975	2,151,455	2,283,142	2,297,922	2,335,324	2,415,986	3.3%
NC	2,003,991	2,050,013	2,127,925	2,167,192	2,175,240	2,195,545	2,238,998	3.8%
OK	155,586	151,680	153,978	166,838	167,938	170,720	176,724	1.5%
SC	1,375,794	1,420,558	1,433,129	1,476,145	1,479,812	1,489,048	1,508,732	0.9%
TN	10,119	10,119	10,119	10,236	10,242	10,257	10,288	0.0%
TX	1,727,960	2,157,976	2,211,474	2,254,898	2,261,392	2,277,755	2,312,681	2.5%
VA	865,762	782,335	787,702	806,959	808,539	812,517	820,976	0.7%
<b>SOUTH</b>	<b>17,701,377</b>	<b>18,628,033</b>	<b>19,145,287</b>	<b>19,796,802</b>	<b>19,882,415</b>	<b>20,098,672</b>	<b>20,562,977</b>	<b>2.8%</b>

**Pine Grade** Pine grade demand increased 2.8% South-wide, driven by a strong demand early in the quarter. Lumber markets have slowed down in June according to several reports. "Lumber markets falling" appears to be the general theme this quarter. The largest quarterly pine grade demand increases were observed in LA and AR, 6.8% and 4.9%, respectively. Lumber mills demand for PST increased 2.9% and for PCNS 2.6%.

**Hardwood Grade** Hardwood grade demand increased 1% in the quarter. Hardwood pallet wood demand increased 0.6% and HST demand increased 1.1% in the quarter. The largest demand increases were reported in AR and TN. Several reporters indicated strong lumber demand for hardwood sawtimber during the quarter. A strong increase in demand is expected by Q4 on housing growth, falling unemployment and low diesel prices.

### Hardwood Grade Demand in Green Tons, Outlook and % Change, Q1 2012-Q2 2012

STATES	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	% change
AL	652,380	641,442	641,442	679,325	653,859	681,924	660,181	0.0%
AR	418,592	385,728	419,574	429,248	429,883	432,007	438,058	8.8%
FL	55,680	55,680	55,680	64,296	65,604	65,748	67,807	0.0%
GA	536,507	535,405	536,139	595,099	604,647	604,673	618,876	0.1%
LA	202,734	202,734	202,734	245,441	251,755	252,985	263,377	0.0%
MS	817,674	811,164	811,164	860,591	870,339	868,324	881,281	0.0%
NC	1,006,977	1,013,681	1,006,130	1,103,644	1,119,965	1,119,310	1,143,049	-0.7%
OK	11,259	11,259	11,259	11,350	11,421	11,366	11,431	0.0%
SC	192,123	192,123	192,123	215,967	219,726	219,884	225,592	0.0%
TN	898,062	873,954	906,574	947,463	956,752	953,808	965,402	3.7%
TX	416,791	414,591	416,015	430,985	434,832	433,304	437,881	0.3%
VA	768,982	764,940	764,679	807,719	816,507	814,434	825,926	0.0%
<b>SOUTH</b>	<b>5,977,761</b>	<b>5,902,701</b>	<b>5,963,513</b>	<b>6,391,128</b>	<b>6,435,291</b>	<b>6,457,766</b>	<b>6,538,860</b>	<b>1.0%</b>

# WOOD DEMAND REPORT

## PINE AND HARDWOOD PULPWOOD PRODUCT WOOD DEMAND DATA BY MARKET

### Pine Pulpwood and Direct Chips Demand in Green Tons and % Change, Q1 2012-Q2 2012

STATES	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	% change
AL	4,423,049	4,433,101	4,640,755	5,516,408	5,308,134	* pulp futures do not extend past Q4 2012		4.7%
AR	1,354,747	1,346,573	1,421,650	1,533,669	1,517,370			5.6%
FL	2,479,281	2,517,633	2,510,769	2,688,507	2,658,653			-0.3%
GA	5,654,961	5,761,003	5,533,906	6,251,236	6,102,924			-3.9%
LA	2,747,153	2,575,445	2,434,173	2,588,662	2,561,489			-5.5%
MS	2,677,596	2,676,664	2,705,323	3,306,298	3,160,882			1.1%
NC	1,398,114	1,072,525	1,370,541	1,426,934	1,428,885			27.8%
OK	397,386	421,051	413,770	431,423	433,286			-1.7%
SC	3,037,558	3,053,089	3,004,284	3,245,992	3,208,561			-1.6%
TN	751,287	735,027	730,596	837,287	812,583			-0.6%
TX	1,679,303	1,557,425	1,682,032	2,038,102	1,967,972			8.0%
VA	1,177,201	1,207,905	1,190,675	1,270,016	1,267,594			-1.4%
<b>SOUTH</b>	<b>27,777,636</b>	<b>27,357,441</b>	<b>27,638,474</b>	<b>31,134,536</b>	<b>30,428,332</b>			<b>1.0%</b>

**Pine Pulpwood and Direct Chips** Demand increased 1.03% across the South with log portion increasing ~1%. The top 3 states by consumption (NC, TX and AR) reported strong consumption increase. PPW and direct chips demand declined in LA, GA and OK. PPW and direct chips demand was only slightly (0.3%) higher than in Q2 2011. The outlook for strong growth is a result of low-fitting model and is likely a maximum possible scenario.

**Hardwood Pulpwood and Direct Chips** Demand for hardwood pulpwood and direct chips increased 1.12% in Q2 2012. In this quarter all of the demand increase is attributed to roundwood; direct chips declined slightly. The largest demand increase was reported in AL and MS. Consumption declined in SC and TN. The strong demand outlook relies on low-fitting model and should be considered as a maximum growth of the timber product given macroeconomic projections.

### Hardwood Pulpwood and Direct Chips Demand in Green Tons and % Change, Q1 2012-Q2 2012

STATES	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	% change		
AL	2,488,101	2,474,868	2,534,560	2,979,484	2,658,658	* pulp futures do not extend past Q4 2012		2.4%		
AR	984,330	994,257	994,257	1,176,574	1,041,697			0.0%		
FL	Omitted due to confidentiality									
GA	945,752	941,594	936,564	1,104,043	986,032			-0.5%		
LA	695,681	688,301	698,622	819,861	727,726			1.5%		
MS	508,881	458,180	468,847	548,604	488,883			2.3%		
NC	431,996	432,102	432,707	511,724	455,923			0.1%		
OK	Omitted due to confidentiality									
SC	693,705	693,457	675,591	809,875	711,194			-2.6%		
TN	360,922	399,954	369,093	454,642	397,530			-7.7%		
TX	586,528	488,424	488,424	574,590	513,891			0.0%		
VA	Omitted due to confidentiality									
<b>SOUTH</b>	<b>8,937,965</b>	<b>8,891,791</b>	<b>8,978,219</b>	<b>10,562,709</b>	<b>9,406,701</b>			<b>1.0%</b>		

# WOOD DEMAND REPORT

## WOOD DEMAND OUTLOOK OVERVIEW

The Wood Demand Outlook is a set of statistical models that forecasts likely Southern demand for 4 primary timber products from forecasted third-party macroeconomic inputs. Estimated by product at the regional level the demand outlook is scaled down to individual states with individual state region-state demand historic elasticity.

### Grade (Pine and Hardwood) Demand:

Pine Grade Demand = f (macroeconomic factors)

The Pine Grade (includes pine sawtimber and pine chip-n-saw) Demand outlook projects regional product demand by all users from a set of macroeconomic factors.

Hardwood Grade Demand = f (macroeconomic factors)

The Hardwood Grade (includes hardwood sawtimber and hardwood pallet wood) Demand outlook projects regional product demand by all users from a set of macroeconomic factors.

### Pulpwood (Pine and Hardwood) and Direct Chips Demand:

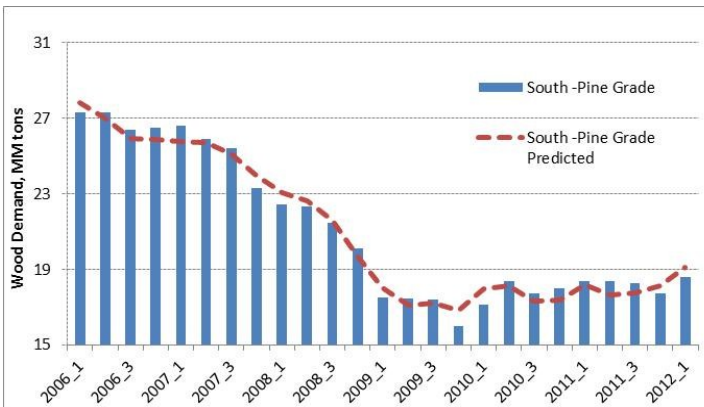
Pine Pulpwood & Dir. Chips Demand (PPWD) = Pine Pulpwood (pulp/paper, chip) + Pine Pulpwood (OSB) + Pine Pulpwood (other)+ Pine Dir. Chips

The PPWD demand outlook aggregates projected pulpwood demand by three types of pine pulpwood and direct chips facilities: pulp/paper and chip facilities, OSB facilities, and other facilities (e.g. mulch and lumber) with projected pine direct chips demand by all users.

Hardwood Pulpwood & Direct Chips (HPWD) = Hardwood Pulpwood (pulp/paper, chip) + Hardwood Pulpwood (other)+ Hardwood Direct Chips

The HPWD demand outlook aggregates projected pulpwood demand by two types of hardwood pulpwood and direct chips facilities: pulp/paper and chip facilities, and other facilities (e.g. mulch and lumber) with projected hardwood direct chips demand by all users.

### Pine Grade Demand Outlook—Model fit



**Pine Grade Demand** = f (Housing Starts, Framing Lumber price, Unemployment, Diesel price)

**Select stats:**

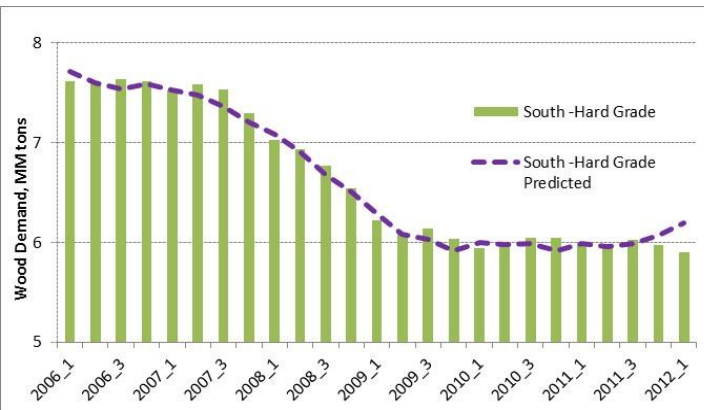
$R^2 = 0.979$

F= 239.22

N= 25

The 4-factor model for Pine Grade Demand has a good fit and explains most of variability in quarterly demand over the past 6 years. Both indicators of timber demand—housing starts and lumber prices tend to lift demand for softwood timber with parameter elasticity 8.7% and 20.9%, respectively. Unemployment and diesel prices (-6.9% parameter elasticity) put downward pressure on regional pine grade demand.

### Hardwood Grade Demand Outlook—Model fit



**Hardwood Grade Demand** = f (Housing Starts, Unemployment, Diesel price)

**Select stats:**

$R^2 = 0.979$

F=340.02

N=25

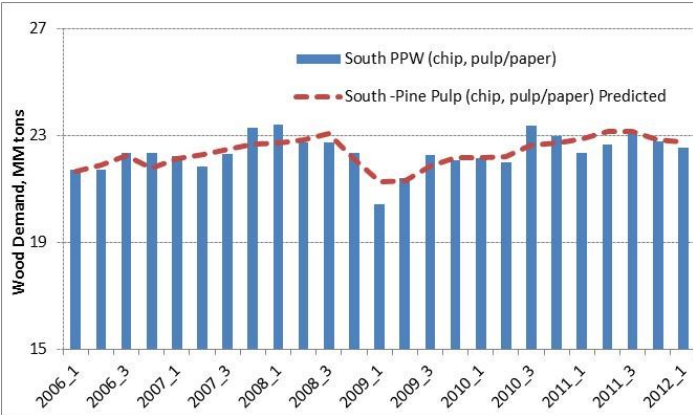
The 3-factor model for Hardwood Grade Demand has a good fit and explains most of variability in quarterly demand over the past 6 years. Housing starts, an indicator of timber demand tend to lift demand for hardwood timber with 8.4% parameter elasticity. Unemployment and diesel price (-6.2% parameter elasticity) put downward pressure on regional hardwood grade demand.

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# WOOD DEMAND REPORT

## WOOD DEMAND OUTLOOK OVERVIEW—CONTINUED

### Pine Pulpwood (pulp/paper, chip) Demand Outlook—Model fit



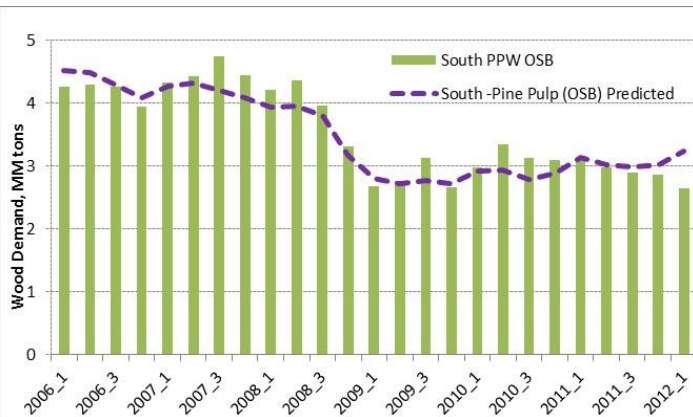
**Pine Pulpwood Demand (pulp/paper, chip) = f (GDP, Gas price (lag), Pulp Price, Inflation)**

**Select stats:**

$R^2=0.655$   
F=9.49  
N=25

The 4-factor model for Pine Pulpwood Demand by pulp/paper and chip facilities has a moderately good fit and explains more than half of quarterly variability in quarterly demand over the past 6 years. Low predictive power is due to high influence of unexpected (e.g. weather related or unobserved) factors on pulpwood demand. GDP (16.7% elasticity) and end-use price (8.7% elasticity) are primary statistically significant predictors.

### Pine Pulpwood (OSB) Demand Outlook—Model fit



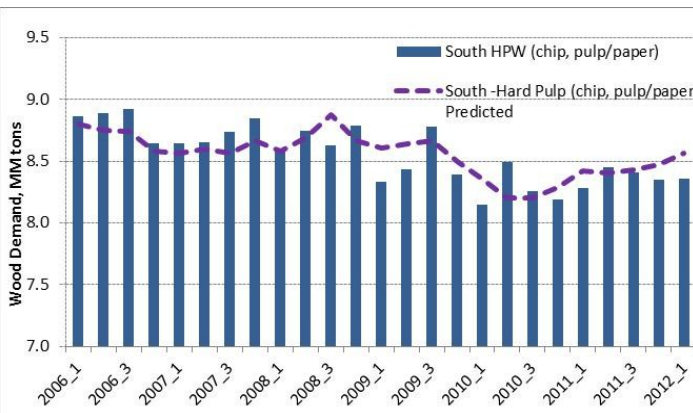
**Pine Pulpwood Demand (OSB) = f (Framing Lumber price, Unemployment, Inflation)**

**Select stats:**

$R^2=0.863$   
F=44.14  
N=25

The 3-factor model for Pine Pulpwood Demand by OSB facilities has a good fit and explains most of quarterly variability in quarterly demand over the past 6 years. Framing Lumber price (21.3% elasticity) serves as a proxy for end-use demand indicator for housing and, along with inflation tend to lift demand for pine pulpwood. Unemployment puts downward pressure on regional pine pulpwood demand for pulpwood from OSB consumers.

### Hard Pulpwood (pulp/paper, chip) Demand Outlook—Model fit



**Hardwood Pulpwood Demand (pulp/paper, chip) = f (GDP, Gas price (lag), Pulp Price, Inflation)**

**Select stats:**

$R^2=0.562$   
F=6.41  
N=25

The 3-factor model for Hardwood Pulpwood Demand by pulp/paper and chip facilities has a low predictability and explains slightly more than half of quarterly variability in quarterly demand over the past 6 years. Due to low predictive power this outlook's results should only be considered as **guidance**. GDP and own end-use price are primary predictors.

#### SUBSCRIPTION INFORMATION:

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