2016 Hardwood Consumption

- Grade Lumber: 43.9%
- Pallet Lumber, Board Road/Mat Timbers, and Ties: 56.1%

Industrial Products: 4.704B
Grade Lumber: 3.681B
Total: 8.385B

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Hardwood Consumption 2005

- Grade Lumber: 59.7%
- Pallet Lumber, Cants, Board Road/Mat Timbers, and Ties: 40.3%

Grade Lumber: 6.9B Bd. Ft.
Total: 11.55B Bd. Ft.

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Industrial and Grade Lumber Groups as a Percentage of the Total US Hardwood Marketplace

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Industrial lumber
Grade Lumber (All)
Performance by the major market sectors for sawn hardwood products is influenced by:

1. The Economy
2. Residential construction
## IMF World Economic Outlook Update, January 2017

<table>
<thead>
<tr>
<th>Region</th>
<th>2017</th>
<th>2018</th>
<th>Emerging and Developing Asia</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Output</td>
<td>3.4</td>
<td>3.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Economies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>2.3</td>
<td>2.5</td>
<td>China</td>
<td>6.5</td>
<td>6.0</td>
</tr>
<tr>
<td>Euro Area</td>
<td>1.6</td>
<td>1.6</td>
<td>India 5/</td>
<td>7.2</td>
<td>7.7</td>
</tr>
<tr>
<td>Germany</td>
<td>1.5</td>
<td>1.5</td>
<td>ASEAN-5 6/</td>
<td>4.9</td>
<td>5.2</td>
</tr>
<tr>
<td>France</td>
<td>1.3</td>
<td>1.6</td>
<td>Emerging and Developing Europe</td>
<td>3.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Italy</td>
<td>0.7</td>
<td>0.8</td>
<td>Latin America and the Caribbean</td>
<td>1.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Spain</td>
<td>2.3</td>
<td>2.1</td>
<td>Brazil</td>
<td>0.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Japan 3/</td>
<td>0.8</td>
<td>0.5</td>
<td>Mexico</td>
<td>1.7</td>
<td>2.0</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1.5</td>
<td>1.4</td>
<td>Middle East, North Africa, Afghanistan, and Pakistan</td>
<td>3.1</td>
<td>3.5</td>
</tr>
<tr>
<td>Canada</td>
<td>1.9</td>
<td>2.0</td>
<td>Saudi Arabia 7/</td>
<td>0.4</td>
<td>2.3</td>
</tr>
<tr>
<td>Commonwealth of Independent States</td>
<td>1.5</td>
<td>1.8</td>
<td>Sub-Saharan Africa</td>
<td>2.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Russia</td>
<td>1.1</td>
<td>1.2</td>
<td>Nigeria</td>
<td>0.8</td>
<td>2.3</td>
</tr>
<tr>
<td>Excluding Russia</td>
<td>2.5</td>
<td>3.3</td>
<td>South Africa</td>
<td>0.8</td>
<td>1.6</td>
</tr>
</tbody>
</table>
The average homeownership rate in the US from 1965 through Q2 2016 is 65.3%.

Homeownership peaked in 2004 at 69.0%.

2016 average of 63.4% was marginally higher than 2015, which was the lowest rate of ownership since 1965.

Source: US Census Bureau

Graph: HMR Executive®
US Single Family Housing
Starts, Completions, and Units Under Various Stages of Construction

Source: US Census Bureau
Graph: Hardwood Market Report
US Domestic Consumption of Hardwoods

Sources: RTA and Hardwood Market Report
Graph: HMR Executive®
Board Road and Mat Timbers

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2015 to 2016 -2.2%

*B Most recent data*
US Wooden Packaging and Container Industry
Estimated Annual Consumption of Sawn Hardwoods

- HMR Estimated Consumption
- Consumption at the rate of US economic growth (Chained 2009 $)

GDP-Based Projection for 2016 was 641,000,000 BF more than HMR est.

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19.6% variance
Furniture

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2008 to 2016  -36.9%
2015 to 2016  -6.2%
Moulding and Millwork

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2008 to 2016 -38.9%
2015 to 2016 +5.4%
Flooring

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2008 to 2016 -9.4%
2015 to 2016 +9.2%
Exports

2008 to 2016  +84.3%

2015 to 2016  +11.2%

Source: USDA FAS
Graph: Hardwood Market Report
US Hardwood Lumber Exports to China vs the Rest of the World

Source: USDA FAS
Graph: Hardwood Market Report

* 2016 Annualized through October
US Exports of Hardwood Lumber to China

- **2009 - Current**: China's Growing Middle and Upper Classes Consuming US Hardwoods.

Export volumes increased 760%

US Exports to China in 2016 (850.7 million b.f.) surpassed 2015 volume by 24%.

Export volumes increased 324%

Source: USDA FAS

Graph: HMR Executive®
Types of Businesses Having Problems With Residual Wood Waste

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Sawmills: 69%
Yards: 20%
Secondary Manufacturers: 0%
Types of Businesses Not Having Problems With Residual Wood Waste

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- Sawmills: 31%
- Yards: 80%
- Secondary Manufacturers: 100%
Makeup of Businesses Having Problems or Acknowledging Problems Exist With Residual Wood Waste

Sawmills 92%

Yards 8%

Secondary Manufacturers 0%

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Reasons for Reduced Sales and Values of Residuals

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- Low Cost Fossil Fuels: 40%
- Unusually Warm Temperatures: 20%
- Decreased Paper and Pulp Production: 30%
- Fewer or Limited Market Outlets: 15%
Companies Having Positive Results With Residual Wood Materials

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<table>
<thead>
<tr>
<th>Material</th>
<th>Sawmills</th>
<th>Yards</th>
<th>Secondary Mfgs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chips</td>
<td>13%</td>
<td>6%</td>
<td>40%</td>
</tr>
<tr>
<td>Dust</td>
<td>19%</td>
<td>31%</td>
<td>40%</td>
</tr>
<tr>
<td>Bark</td>
<td>31%</td>
<td>19%</td>
<td>40%</td>
</tr>
<tr>
<td>Shavings</td>
<td>19%</td>
<td>31%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Spanning 13 Southern States from Texas to Virginia, southern forests include a diversity of dynamic landscapes and ecosystems, and play a vital role in the region's culture and economy. The forests are highly productive, providing raw materials that fuel regional, national, and global economies.

Southern forests, known as the “wood basket” of the Nation, accounted for 63% of the total timber volume harvested in the United States in 2011 (Oswalt and others 2014). Primary wood-processing plants in the South produced 45% of the saw-log products, 63% of veneer products, 74% of the pulpwood, and 64% of all composite products in the Nation in 2011 (Oswalt and others 2014). The South’s forests are so productive that, while they makeup only 2% of the global forest cover, they produce 12% of the world’s industrial roundwood and 19% of its pulp and paper products—greater production than that of any other nation.

Southern Forest Products
An Economic Engine

Southern forests provide a significant portion of the forest product output of the United States while only having 32% of the forests of the US.
<table>
<thead>
<tr>
<th>SUM: Total (cuft)</th>
<th>SUM: Total (cuft) Softwood only</th>
<th>SUM: Total (cuft) Hardwood only</th>
<th>SUM: Sawlog (cuft) Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,795,452,000</td>
<td>5,162,148,000</td>
<td>1,633,304,000</td>
<td>2,174,120,000</td>
</tr>
</tbody>
</table>
terawatthours

- 2005: 54.3 terawatthours
  - Midwest: 26.7
  - West: 9.4
  - Northeast: 9.9
  - South: 12.2

- 2010: 56.1 terawatthours
  - Midwest: 25.6
  - West: 12.8
  - Northeast: 9.9
  - South: 12.2

- 2015: 64.2 terawatthours
  - Midwest: 31.1
  - West: 13.5
  - Northeast: 11.4
  - South: 8.3
Seasonal Temperature (T2m) Anomalies valid for month: January 2017
based on ECMWF Seasonal Forecast System (S4) initiated on 01 October 2016
Estimated deviation (anomaly) of the mean from model climate in Celsius degrees
Export Demand for US Wood Pellets Could be As Much As 20% to 40% Greater Than 2016 Sales.
Industrial and Grade Lumber Groups (All)
Shown in Billion Board Feet

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