Global Fluff Pulp Outlook

San Diego, USA
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Market Background
Fluff Pulp Overview

• What is fluff pulp?
  ▪ Wood pulp produced mainly from softwood fiber
  ▪ Used in the absorbent core of hygiene products
    ▪ E.g., baby diapers and feminine care products
    ▪ Primarily produced in the US South

• Accounts for a little less than 10% of total world market wood pulp supply

• Demand growth driven by emerging markets
  • Low market penetration rates
  • Favorable demographic and economic factors
End Uses for Fluff Pulp
Disposable Absorbent Hygiene Products
Fluff Pulp Demand by End Use
Percent of Total, 2015 Estimate

- Disposable Diapers: 38%
- Adult Incontinence: 26%
- Feminine Hygiene: 24%
- Airlaid/Other: 12%

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Demand Overview

• World demand growth continues to be moderate
  ▪ 2015 global consumption estimated at 5.8 million tonnes
  ▪ Forecast to grow 3.7% annually in 2016-2020
  ▪ Mild slowdown in demand growth in 2016-2017 due to weak global economic conditions

• Emerging markets will dominate demand growth
  ▪ Disposable absorbent hygiene product use grows with income
  ▪ 93% of total demand growth to come from emerging markets in 2015-2020

• Mature markets will see little consumption growth
Mature Market Demand Growth Relatively Flat

* USA, Canada, Western Europe, Japan, Oceania
Changing Landscape for Demand
Share of Fluff Pulp Demand by Region

2002
- North America: 26%
- Western Europe: 29%
- Latin America: 10%
- China: 6%
- Japan: 7%
- Other Asia: 9%
- Eastern Europe: 6%
- Oceania: 2%

2015
- North America: 18%
- Western Europe: 19%
- Latin America: 15%
- China: 16%
- Japan: 11%
- Other Asia: 9%
- Eastern Europe: 6%
- Oceania: 2%

Africa/Middle East: 5%
Africa/Middle East: 8%
Demographics and Income Drive Demand

• Potential Absorbent Hygiene Product Users (PAHU) fall into three major categories
  ▪ Children age 0-2.5 (potential diaper consumer)
  ▪ Women age 15-49 (potential feminine care consumer)
  ▪ Adults age 65 and older (potential AI product consumer)

• Per capita income drives fluff consumption per PAHU
  ▪ As income levels rise, more can be spent on convenience goods such as disposable absorbent hygiene products
  ▪ As an economy reaches high levels of income, fluff pulp consumption per user levels off
Global Fluff Demand Curve

2000-2015 Real Income per Capita vs Kilograms of Fluff Consumed per Potential Absorbent Hygiene User*

*Potential absorbent hygiene users (PAHU) include the population 0-2.5 years old, females 15-49 and 65+ years old.
Income Levels on the Rise in Emerging Markets

GDP per Capita, 2005 US Dollars at Purchasing Power Parity
## Large Consumer Base in Emerging Markets

### 2015 Estimate, Millions

<table>
<thead>
<tr>
<th></th>
<th>0-2.5 Years Old</th>
<th>Females 15-49 Years Old</th>
<th>65+ Years Old</th>
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</thead>
<tbody>
<tr>
<td>China</td>
<td>46.8</td>
<td>363.0</td>
<td>41.5</td>
</tr>
<tr>
<td>India</td>
<td>62.2</td>
<td>336.7</td>
<td>73.6</td>
</tr>
<tr>
<td>Other Asia (excl. India)</td>
<td>64.0</td>
<td>354.2</td>
<td>78.9</td>
</tr>
<tr>
<td>Brazil</td>
<td>7.3</td>
<td>56.7</td>
<td>16.3</td>
</tr>
<tr>
<td>Other Latin America</td>
<td>19.1</td>
<td>113.0</td>
<td>32.0</td>
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<tr>
<td>Africa</td>
<td>100.7</td>
<td>284.3</td>
<td>41.5</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>12.1</td>
<td>99.0</td>
<td>54.3</td>
</tr>
<tr>
<td>Middle East</td>
<td>10.6</td>
<td>42.6</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>332.8</strong></td>
<td><strong>1,736.7</strong></td>
<td><strong>345.0</strong></td>
</tr>
</tbody>
</table>
Supply

• Total fluff pulp capacity in 2015 estimated at just under 6.3 million tonnes

• Concentrated industry
  ▪ Top five producers by capacity in 2015 are Georgia-Pacific (G-P), Weyerhaeuser, International Paper (IP), Domtar and Resolute Forest Products
  ▪ These five producers account for over 80% of the market

• Currently large increases in capacity
  ▪ Riegelwood, Ashdown, Ortiguiera and Suzano collectively adding over 1 million tonnes of capacity in one year

• Hardwood fluff may prove to be disruptive
  ▪ BEK production costs are significantly lower than SBSK
  ▪ If product performance proves good, this could put pressure on traditional producers in the future
IP/Weyco Deal Increases Consolidation
Market Share of Top Five Producers by Capacity

2016 Pre-Acquisition

- Georgia-Pacific: 31%
- Weyerhaeuser: 22%
- International Paper: 17%
- Domtar: 8%
- Resolute Forest Products: 4%
- All Other: 18%

2016 Post-Acquisition

- Georgia-Pacific: 31%
- International Paper: 39%
- Resolute Forest Products: 4%
- Domtar: 8%
- All Other: 14%
- Stora Enso: 4%
# New Pulp Capacity

## Fluff Pulp Capacity Projects, 2015-2018

**Thousand Tonnes**

<table>
<thead>
<tr>
<th>Company (Mill)</th>
<th>Location</th>
<th>Country</th>
<th>Market Capacity</th>
<th>Date</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suzano</td>
<td>Suzano</td>
<td>Brazil</td>
<td>100</td>
<td>2015 4Q</td>
<td>Fluff/BHK</td>
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<tr>
<td>Klabin</td>
<td>Paraná</td>
<td>Brazil</td>
<td>400</td>
<td>2016 Q2</td>
<td>Fluff/BSK</td>
</tr>
<tr>
<td>International Paper</td>
<td>Riegelwood</td>
<td>United States</td>
<td>360</td>
<td>2016 Q2</td>
<td>Fluff/BSK</td>
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<tr>
<td>Domtar</td>
<td>Ashdown</td>
<td>United States</td>
<td>515</td>
<td>2016 Q3</td>
<td>Fluff/BSK</td>
</tr>
<tr>
<td>Stora Enso</td>
<td>Skutskär</td>
<td>Sweden</td>
<td>160</td>
<td>2018 Q2</td>
<td>Fluff/BSK</td>
</tr>
</tbody>
</table>
US South Still Dominating Supply
Fluff Pulp Capacity by Major Region

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Fluff Pulp Price

• Strong relationship between paper grade and fluff
  ▪ Large portion of fluff producers can swing between paper grade and fluff
  ▪ Swing to fluff pulp as relative profitability of the grade rises in relation to paper grade

• Prices peaked in 2014-2015
  ▪ Q1 2015 prices reached $1,050/tonne
  ▪ Have declined to current price of $1,010/tonne as operating rates dropped from 94% to 92%

• New supply putting downward pressure on prices
Strong Relationship with Slight Lag
Fluff Pulp and Southern Bleached Softwood Kraft Pulp List Price
Prices Are More Stable
Percentage Change in Paper Grade Pulp Prices and Fluff Pulp Prices

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Thank you for your attention!

For more information:

World Pulp & Recovered Paper Forecast
www.risi.com/WPRP5

World Pulp Monthly
www.risi.com/WPM

Outlook for the World Fluff Pulp Market: Special Market Analysis Study
www.risi.com/fluffpulp16