For More Information

World Pulp & Recovered Paper
5-Year and 15-Year Forecasts
www.risi.com/forecasts

World Pulp Monthly
www.risi.com/wpm
2016-17 Forecast Drivers: Macro, Paper and Board
GDP Growth to Remain Muted in ‘17?
US Dollar Expected to Remain Strong
World Production of Paper and Board: Accelerating, but Very Slowly

Graphic, Packaging and Specialty and Tissue; Percentage Change

2011-2015: 0.7% per year
Most of the Growth in the World Paper Industry Is in Packaging
Why Did World Graphic Paper Demand Not Recover after the Great Recession?

Global Smartphone Shipments Forecast

Billions

Source: BI Intelligence Estimates

6% CAGR 2016-2021

We Are Here
Key End Uses For Market Pulp Looking Flattish in 2017, with Risks.
Outlook for Fiber Markets
World Usage of Recovered Paper and Wood Pulp

Million Tonnes
World Wood Pulp Demand by Major Grade: Bleached Hardwood Still Gaining Market Share Million Tonnes
Despite the Flattening of P&W Production in China, Pulp Imports Remain on an Upward Trend

Pulp Imports per Day, Thousand Tonnes
What Are the Sources of China’s Incremental Pulp Demand?

- Tissue production is rising by about 7% or 600,000 tpy
- Policy closures of “backward” pulp and paper capacity favors BHK consumption growth (at the expense of local fiber, including nonwood)
  - *Based on our study, consumption of straw pulp in tissue and P&W will fall by >1.0 million tonnes between 2015 and 2020*
- Rising demand for higher quality paper raises BHK demand
- Continuing move toward more BHK, less BSK, as new paper machines are installed
- BSK demand for absorbent applications is growing
- Conclusion: Net imports of BHK into China will continue to show solid growth
Supply-Side Changes Are Creating Considerable Pricing Volatility

- APP OKI mill startup (Sumatra) lis imminent
  - 2 x 1.4 million tonnes, assuming starting up two months apart. First runs in November?
- Fourth-quarter 2017:
  - Fibria Tres Lagoas (1.95 million tonnes) BEK
  - Metsa Fibre Aanekoski (700,000 tonnes NBSK, 100k BHK.
In Indonesia, APP’s South Sumatra BHK Project Will Open in Late 2016/Early 2017

- 2.0-2.8 million tonnes per year of BEK and BAK
- Acacia from plantations in South Sumatra
- Unexpected shortfall of woodfiber in Sumatra
- May include paper machines eventually
In Brazil, Five Large BEK Lines Will Be Started Up in 2014-2018

- Suzano Maranhao
  - 1.5 MTPY, 2014
- CMPC Guaiba
  - 1.3 MTPY, 2015
- Klabin Ortigueira
  - 1.1 MTPY, 1Q 2016
- Fibria Tres Lagoas
  - 1.95 MTPY, 4Q 2017
- Eldorado Tres Lagoas
  - ~2.2 MTPY, 2019
Key BSK Capacity Developments

• 2016
  - Klabin Ortigueira, March: 400,000 tonnes fluff/SBSK
  - IP Riegelwood, 2Q16: 360,000 tonnes fluff/SBSK
  - Domtar Ashdown, 3Q16: >300,000 tonnes fluff/SBSK
  - Sodra Varo, 2H16: 275,000 tonnes
  - Asia Symbol (RGE/APRIL) Rizhao mill: BSK on 300,000 tonne pulp line (~250,000 BSK)

• 2017
  - Metsa Fibre, 3Q17-4Q17: 700,000 tonnes BSK
  - Domtar Plymouth: -90k fluff
  - Belarus mill could be delayed again to late in 2017 (300k)
Key BHK Capacity Developments

• 2016
  ▪ Klabin Ortigueira, March: 1.1 million tonnes
  ▪ APP Sumatra (OKI), 4Q16 (?) 2.0-2.8 million tonnes
  ▪ Rizhao: Small line switching to BSK (-300k)
  ▪ APRIL Kerinci: New PM (-250k market, +250k integrated)
    • Minor effect overall, Same for Other “market to integrated) conversions.

• 2017
  ▪ Fibria, 4Q17: 1.95 million tonnes
  ▪ Metsa Annekoski: +100k, 3Q17
  ▪ APRIL Kerinci: Conversion to DP (-200-300k 2017 to 2018)
Chinese BHK Prices Rebounded in the First Half, Then Lost Momentum
BHK “Cash” Cost Curve Nov. 2Q16
Mill level costs. No D, I, SG&A, or logistics
BSK Prices Weakened in 2H, with New Capacity Running, as Expected.
Mill level costs. No D, I, SG&A, or logistics

Cash Cost Graph

Asia

Europe

South Amer.

North America

NZ
Global OCC Market

Domestic OCC Prices

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Global ONP Market
Global High Grades Market

[Graph showing trends of US SOP, German 310, and China IM SOP prices from 2006 to 2016]
High Grades and Virgin Pulp

Prices in the US Market

- SOP #37
- Envelope Cut
- NBHK (R)
West European PAB Production and RCP Usage Rate

![Graph showing West European PAB Production and RCP Usage Rate from 2000 to 2018. The graph includes data for Newsprint, P&W, Containerboard, Tissue, Other, and the RCP Usage Rate - R.](image-url)
Western European PAB Production

2015: 84.9 Million Tonnes

2018: 84.0 Million Tonnes
Western European RCP Market
Domestic Demand vs. Net Exports

Net export share
2000: 6%
2004: 11%
2008: 16%
2012: 16%
2014: 14%
2015: 15%
## Major Containerboard Capacity Expansions in Europe: 2016-2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Capacity (Thousand Tonnes)</th>
<th>Year</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>350</td>
<td>2016</td>
<td>Recycled</td>
</tr>
<tr>
<td>Germany</td>
<td>900</td>
<td>2017</td>
<td>Recycled</td>
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<tr>
<td>Netherlands</td>
<td>385</td>
<td>2016</td>
<td>Recycled</td>
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<tr>
<td>Italy</td>
<td>550</td>
<td>2017</td>
<td>Recycled</td>
</tr>
<tr>
<td>Spain</td>
<td>380</td>
<td>2017</td>
<td>Recycled</td>
</tr>
<tr>
<td>Austria</td>
<td>450</td>
<td>2017</td>
<td>Recycled</td>
</tr>
<tr>
<td>Russia</td>
<td>115</td>
<td>2016</td>
<td>Recycled</td>
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<tr>
<td>Romania</td>
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<td>Poland</td>
<td>40</td>
<td>2017</td>
<td>Kraftliner</td>
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<tr>
<td>Poland</td>
<td>250-300</td>
<td>2018</td>
<td>Recycled</td>
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</tbody>
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