Global Pulp Market Outlook
Nearing a Cyclical Peak or in the Midst of a Prolonged Upturn?

RISI International Woodfiber Conference
September 2018

Rod Young
Chief Economic Advisor
Agenda

• Review of recent market conditions
  ▪ Aggressive environmental policy changes in China
  ▪ Synchronized growth in the global economy
  ▪ Unexpected downtime continues to impact the market
• Outlook for paper and board
• Planned pulp capacity expansion
• Review of BHK and BSK cost curves
• Pulp forecast summary
Major RCP Policy Changes in China

- New RCP import management system
- Mixed paper ban in effect as of January 1, 2018
- New contamination level of 0.5% took effect on March 1, 2018

Latest updates
- China inspecting ALL containers from the USA since early May
- CCIC now performing pre-inspection of ALL exports to China
- 25% tariff on RCP imports since early August
- China to ban ALL RCP imports by 2020!!!
The Impact of China’s RCP Import Policy Changes
RCP Imports, Thousand Tonnes

China RCP Imports

RCP Fiber Loss

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Chinese Policies Have Resulted in Increased Domestic RCP Price Levels and Volatility

Imported and Domestic OCC Prices, US Dollars per Tonne
Synchronized Growth in the Global Economy
Purchasing Managers Indices
Chinese Domestic Prices for Pulp Rebound Quickly

China Domestic Resale and Imported Pulp Prices
BSK Producers Maintain Price Premium to BHK

Gross Pulp Prices, Delivered to China, US Dollars per Tonne

Source: RISI.
Near-Term Conditions and Trends

• Pulp inventories are low across the industry
  ▪ Unexpected and planned downtime
  ▪ Differences in China between small and large buyers
  ▪ Some recent signs of normalization
• Pulp prices are high and paper prices have been rising
  ▪ Pace of paper price gains lagging and margins getting squeezed
• Exchange rate changes mitigating upward pressure on prices
• Paper and board markets now in seasonally weak period
• DP/BHK price differential remains narrow
  ▪ Bringing swing capacity back into paper grade, for now...
Pulp Market in the Midst of an Historical Run
Total Change in Gross NBSK Delivered to Europe, US Dollars per Tonne
Producers Generating Near Record Margins
Net NBSK Price/Average Variable Cost of High-Cost Producer, Delivered to Europe
Pulp Price Gains Outpace Tissue Parent Rolls

BEK/High Quality Virgin Parent Roll Price Ratio, Delivered to USA
DP-BEK Price Spread in China

US Dollars per Tonne

Source: RISI

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Supply Disruptions Completely Offset the Wave of Recently Started Capacity

- Large capacity additions started in 2017 ramping up in 2018
  - OKI mill in Indonesia estimated at around 2 million tonnes
  - Fibria’s new line at Três Lagoas now fully ramped up
  - Metsä Fibre’s new line in Finland expected to be running at full capacity in the third quarter
  - SCA Ostrand now running
- Unexpected downtime helped to offset new capacity
- Suppliers are taking offsetting steps as new lines reach full capacity
  - Fibria continues to take downtime at the Aracruz mill
  - APP has been deliberate about new OKI tonnage and adjusted timeline for planned maintenance downtime in 2018
### Unexpected Downtime Continues at a Lower Rate

Capacity Lost to Unexpected Downtime, Thousand Tonnes

<table>
<thead>
<tr>
<th>Company</th>
<th>Mill</th>
<th>Country</th>
<th>Grade (Comment)</th>
<th>Days</th>
<th>Capacity / Day</th>
<th>Total</th>
<th>Idle Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>—</td>
<td>Regionwide</td>
<td>Nordics</td>
<td>NBSK (Exceptionally Warm Winter)</td>
<td>—</td>
<td>—</td>
<td>45</td>
<td>2018Q3</td>
</tr>
<tr>
<td>Fibria</td>
<td>Aracruz</td>
<td>Brazil</td>
<td>BEK (Proactive Downtime)</td>
<td>—</td>
<td>—</td>
<td>50</td>
<td>2018Q3</td>
</tr>
<tr>
<td>AV Group</td>
<td>Terrace Bay</td>
<td>Canada</td>
<td>NBSK (Lightning Strike)</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>2018Q3</td>
</tr>
<tr>
<td>Fibre Excellence</td>
<td>Tarascon</td>
<td>France</td>
<td>SBSK (Upgrades to Environmental Controls)</td>
<td>30</td>
<td>0.8</td>
<td>23</td>
<td>2018Q3</td>
</tr>
<tr>
<td>Södra Cell</td>
<td>Mönsterås</td>
<td>Sweden</td>
<td>NBSK (Unexpected Shut)</td>
<td>—</td>
<td>—</td>
<td>20</td>
<td>2018Q3</td>
</tr>
<tr>
<td>Hyogo Pulp</td>
<td>Tanigawa</td>
<td>Japan</td>
<td>USK (Boiler Explosion)</td>
<td>33</td>
<td>0.7</td>
<td>23</td>
<td>2018Q3</td>
</tr>
<tr>
<td><strong>Third Quarter Net Total (Rated Capacity)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>171</strong></td>
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<tr>
<td><strong>Year to Date Unexpected Downtime</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>1,198</strong></td>
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</table>
2018-2019 Forecast Drivers
World Production of Paper and Board Accelerating, but Very Slowly

Graphic, Packaging, Specialty and Tissue
Percentage Change

<table>
<thead>
<tr>
<th>Year</th>
<th>Graphic</th>
<th>Packaging</th>
<th>Specialty</th>
<th>Tissue</th>
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<td>05</td>
<td>2.1%</td>
<td></td>
<td></td>
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<tr>
<td>06</td>
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<tr>
<td>07</td>
<td>3.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td></td>
<td></td>
<td>-0.6%</td>
</tr>
<tr>
<td>09</td>
<td></td>
<td></td>
<td></td>
<td>-5.3%</td>
</tr>
<tr>
<td>10</td>
<td>6.6%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1.1%</td>
<td>0.3%</td>
<td>1.0%</td>
<td>0.9%</td>
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<tr>
<td>12</td>
<td>1.2%</td>
<td>1.7%</td>
<td>1.9%</td>
<td>1.9%</td>
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<tr>
<td>13</td>
<td>1.7%</td>
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<td>1.9%</td>
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<tr>
<td>14</td>
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<td>1.9%</td>
<td>1.9%</td>
<td>1.7%</td>
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<tr>
<td>15</td>
<td>1.7%</td>
<td>1.9%</td>
<td>1.9%</td>
<td>1.7%</td>
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<tr>
<td>16</td>
<td>1.7%</td>
<td>1.9%</td>
<td>1.9%</td>
<td>1.7%</td>
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<tr>
<td>17</td>
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<td>1.9%</td>
<td>1.9%</td>
<td>1.7%</td>
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<tr>
<td>18</td>
<td>1.7%</td>
<td>1.9%</td>
<td>1.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>19</td>
<td>1.7%</td>
<td>1.9%</td>
<td>1.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>20</td>
<td>1.7%</td>
<td>1.9%</td>
<td>1.9%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

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Most of the Growth in the Paper Industry Is in Packaging—with a Modest Effect on Market Pulp
World Usage of Recovered Paper and Wood Pulp

Million Tonnes

Wood Pulp
Recovered Paper

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Wood Pulp Demand by Major Region
Relatively Little BHK Capacity Expansion

- **Suzano (Brazil)**
  - 90,000 tonnes incremental at Maranhão mill, net of integration into tissue
- **ENCE, Altri, Navigator (Iberia)**
  - 250,000 tonnes in incremental projects net of integration into tissue
- **APRIL Kerinci (Indonesia)**
  - Further conversion to DP
  - -200,000-300,000 tonnes, 2018-2019
- **Asia Symbol Rizhao (China)**
  - Beginning conversion to DP
  - -200,000 tonnes, 2018-2019?
- **UPM (Kaukus and Kymi)**
  - 150,000 tonnes from debottleneck, 2017-2018
- **Svetlogorsk (Belarus)**
  - Started production in November 2017
  - 100,000 tonnes in 2018(?)
- **Sun Paper Savannakhet (Laos)**
  - Start up in second quarter of 2018
  - Swing mill: 300,000 tonnes BHK / 250,000 tonnes DP
- **Eldorado/PE (Brazil)**
  - Received permit to produce additional 55,000 tonnes
- **Montes del Plata (Uruguay)**
  - 100,000 tonnes from debottleneck
- **Chenming Shouguang (China)**
  - 1.2 million tonne new line (integrated and delayed)
BHK “Cash” Cost Curve, 1Q18
Machine Level Costs, Delivered Shanghai,
Not Including I, SG&A or Logistics
Similar Story for BSK Capacity Expansion...

- **UPM (Kaukus and Kymi)**
  - 50,000 tonnes from debottleneck, 2017-2018

- **Svetlogorsk (Belarus)**
  - 300,000 tonnes, 2018?

- **SCA Östrand (Sweden)**
  - 470,000 tonnes, June 2018

- **Chenming Huanggong (China)**
  - 600,000 tonnes, fourth quarter 2018?
  - Swing mill with DP

- **Resolute Saint Felicien (Canada)**
  - 30,000 tonnes, upgrades 2018

- **Mondi Steti (Czech Republic)**
  - 70,000 tonnes BSK, late 2018

- **Oji Tasman (New Zealand)**
  - -180,000 tonnes, conversion to UKP, 2019

- **BillerudKorsnäs Gruvön (Sweden)**
  - -130,000 tonnes, integrated to new BM, 2019

- **Arauco Valdivia**
  - -500,000 tonnes, conversion to DP, 2019
  - Plan to increase DP share as demand increases

- **Stora Enso Enocell (Finland)**
  - -320,000 tonnes, conversion to DP, 2019
BSK “Cash” Cost Curve, 1Q18
Machine Level Costs, Delivered Shanghai, Not Including I, SG&A or Logistics
Wood Pulp Production by Major Region
Inflation Adjusted Net Pulp Prices Delivered to Europe
US Dollars (2017) per Tonne
Forecast Summary

• Pulp market will reach a relative balance in the fourth quarter of 2018
  ▪ Pulp supply increases as new lines ramp up
  ▪ Chinese pulp demand eases due to oversupply in paper and board
  ▪ Demand strengthens seasonally
• Pulp demand will remain strong due largely to tight fiber supplies in China
• Market conditions will tighten again into 2019 as capacity expansion slows and demand tracks higher with continued economic growth
• Risks revolve largely around negative impacts on global economic growth from the simmering trade war
Thank you!

For more information:

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

World Pulp Monthly
www.risi.com/wpm