World Pulp Outlook
Cautious optimism for the latter half of 2019

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Agenda

• Review of current market conditions
• Supply and demand outlook
• Forecast summary and risks to the forecast
Recent market conditions

Supply disruptions ease as demand falters
After the strong uptick in supply disruptions through much of 2018, markets adjust as supply normalizes.

End-user margins remain squeezed
Rapid rise in input costs drive margins for non-integrated paper and board producers lower while still facing pockets of oversupply.

Weak demand and high inventories weigh on prices
Inventories remain elevated heading into the weak summer months and demand has yet to show meaningful improvement.

Impact of Chinese import policies behind us for pulp
China is expected to continue toward zero imports of recovered paper by the end of 2020, but the impacts on the fiber markets are heavily weighted toward recovered paper and recycled pulp.

Chinese wood pulp import growth slows

WOOD PULP IMPORTS ACCELERATE IN 2017
- Growth was steady and strong during the last decade plus
- Ratcheted higher in 2017 as markets reacted to new Chinese policies
- Settled back lower once limited market share gains were made
- Weak demand and high stocks resulted in 1Q19 imports down 16% from 2018
- Only marginal upward pressure on wood pulp imports moving forward

Monthly bleached kraft pulp imports to China

• BSK
• BHK
Unexpected downtime settles at a lower rate

Cumulative price change

Net price / high average variable cost

Pulp markets recently completed an historical run...
Meanwhile, paper and board producers margins remain squeezed

**PRODUCT PRICES NOT ABLE TO KEEP PACE WITH PULP**
- Margins increasingly tight
- Some paper markets already weak due to oversupply
- Tissue producers especially challenged

China stalls as global economic growth slows

**SYNCHRONIZED GLOBAL GROWTH DECELERATING**
- Developed countries still growing but at a slower rate
- This is not unexpected given the length of this business cycle
- New leaders, policies and the rise of protectionism have both stimulated growth and created headwinds
- The Chinese economy has not regained upward momentum yet
Inventory cycle is key to price inflection point

INVENTORIES BUILD IN CHINA AS DEMAND SLOWS

- Record pulp production by some producers in the third quarter arrived just as demand faltered in China
- Inventory data always difficult to read accurately
- Not just pulp inventories that have grown, also paper and board
- Key to change in price direction is timing of inventory correction

Global producer inventories remain bloated

Source: PPPC, Fastmarkets RISI
Exchange rates matters, and not just on the margin

BEK delivered to Europe

BEK delivered to China

Domestic pulp prices in China searching for a bottom

NBSK prices in China, $/tonne

BEK prices in China, $/tonne

* Reflects net renminbi domestic resale price converted to US dollars, excluding VAT and logistics costs.
NBSK premium to BEK falls as prices tumble

**THE OUTSIZED SPREAD BETWEEN NBSK AND BEK HAS CORRECTED**

- The large spread allowed BSK to fall harder and faster at first
- The spread is now below the cash cost differential, making NBSK more attractive on the margin
- There is a chance that NBSK may firm and move higher before BEK if/when prices meaningfully recover

Spread between US and China remains wide
Shanghai futures contract trends higher in 2019

Shanghai Futures June pulp contract, volume and price (RMB)

But what goes up must come down
NBSK delivered to Northern Europe
Outlook for market pulp

Minimal new capacity expected through 2020
Anticipation of new supply, which has since been delayed, resulted in dearth of projects ready to break ground

Many project announcements after price run
The list of proposed projects for the 2021-2022 time frame is growing, but only a few projects will actually move forward

Tighter markets expected in the near term
Assuming China reaccelerates, the increase in demand against modest capacity gains should result in tighter markets, placing upward pressure on prices in the latter part of 2019

Modest growth in paper and paperboard production masks divergent trends

PACKAGING AND TISSUE DRIVE GROWTH

• Packaging paper accounts for two-thirds of paper production and its share is growing
• Tissue accounts for just 9% of production, but its share is growing as well
• Graphic paper will continue its secular decline due to substitution to electronic media
• China is and will remain the largest paper and board producing region in the world
• The pulp and paper industry in China now faces challenges due to a lack of fiber because of both natural and policy reasons

Growth in end-use markets is slow and steady
Production of paper and board expected to grow moderately, but the grades matter for type of fiber consumed and the impact on fiber demand

World paper and board production by grade

<table>
<thead>
<tr>
<th>Year</th>
<th>Paper packaging and specialties</th>
<th>Graphic papers</th>
<th>Tissue</th>
<th>% Change total paper and board (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>100</td>
<td>150</td>
<td>50</td>
<td>0%</td>
</tr>
<tr>
<td>2017</td>
<td>100</td>
<td>150</td>
<td>50</td>
<td>0%</td>
</tr>
<tr>
<td>2018</td>
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<tr>
<td>2019</td>
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<td>150</td>
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</tr>
<tr>
<td>2020</td>
<td>100</td>
<td>150</td>
<td>50</td>
<td>0%</td>
</tr>
</tbody>
</table>

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Emerging markets drive market pulp demand growth

Average annual growth, 2019-2023

North America
- PAB Q: 1.3%
- PLP APCM: 0.9%

Latin America
- PAB Q: 2.7%
- PLP APCM: 3.7%

Western Europe
- PAB Q: 0.1%
- PLP APCM: -0.8%

China
- PAB Q: 2.5%
- PLP APCM: 0.0%

Rest of World
- PAB Q: 1.6%
- PLP APCM: 2.6%

Other Asia
- PAB Q: 3.4%
- PLP APCM: 3.1%

PAB Q = Paper and board production.
PLP APCM = Apparent consumption of market pulp.

Market pulp supply growth focused in Latin America

Cumulative market pulp capacity growth, 2019-2023

<table>
<thead>
<tr>
<th>Region</th>
<th>Cumulative Growth (Million tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>2.9</td>
</tr>
<tr>
<td>North America</td>
<td>0.5</td>
</tr>
<tr>
<td>Western Europe</td>
<td>1.4</td>
</tr>
<tr>
<td>Asia</td>
<td>0.5</td>
</tr>
<tr>
<td>All other</td>
<td>1.1</td>
</tr>
<tr>
<td>Total</td>
<td>6.4</td>
</tr>
</tbody>
</table>

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LATIN AMERICAN PRODUCERS DOMINATE THE LOW END OF THE COST CURVE

- Latin American producers benefit from low-cost wood and the exchange rate
- Higher-cost facilities tend to be much smaller and located in Asia and the Northern Hemisphere

EASTERN EUROPEAN AND LATIN AMERICAN PRODUCERS ARE AT THE LOW END OF THE COST CURVE

- Latin American producers benefit largely from the exchange rate
- Pine can be grown in other regions of the world just as well as in Latin America
Forecast summary

- Base case forecast calls for China to reaccelerate in the second half of 2019
- Demand will move ahead of supply again in the second half of 2019
- This will result in tighter markets and upward pressure on prices into 2020
- Risks remain and largely revolve around inventory levels, the health of Chinese economy, the escalating trade war with the US and a looming recession
Thank you for your attention

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Fastmarkets RISI