Pulp market outlook and the growing influence of the viscose sector
EUROPULP/UTIPULP, Barcelona, 14th September 2017
Agenda

- Some observations on the short-term cycle
- Growing influence of the viscose sector
Five peaks (and four troughs) since 2008

- OPEC 1: Nordic wood costs rise
- Energy & wood costs fall
- OPEC 2: Rising energy costs
- Recession and start-up of new low cost mills
- Excess capacity
- Nordic devaluation
- New low-cost mills
- Economies boom
- No new capacity
- US dollar weakens
- Rising wood costs
- Weak US dollar
- Rising fibre & energy costs
- China growth
- Dot com boom/bust
- Emergence of Chinese market
- Wood costs fall
- Strengthening US$
- Financial crisis
- Stronger dollar
- Weak US dollar
- Recession
- Start-up of new low cost mills
- Excess capacity
- Financial stimulus
- Production curtailment
- Chilean earthquake
- ECB commits to "whatever it takes"
- QE3 in US
- Weak US dollar
- Rising fibre & energy costs
- China growth
- ECB commits to "whatever it takes"
- QE3 in US
- Financial crisis
- Stronger dollar
- China slows
- Euro crisis
- Stronger dollar
- China slows
- ECB commits to "whatever it takes"
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- Financial crisis
- Stronger dollar
- China slows
- Euro crisis
- Stronger dollar
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Five peaks (and four troughs) since 2008

PIX indices for NBSK and BHKP, in €

Price cycles may be distorted by currency movements and discount creep

Source: FOEX
Pulp producers in Brazil

Money that grows on trees

Brazil's economy is crumbling but its giant pulp firms are booming

Mar 26th 2016 | TRÊS LAGOAS, MATO GROSSO DO SUL | From the print edition

LOOK north from atop the 120-metre (390-foot) bleaching tower at the Horizonte 1 pulp mill, and all you see is plantations of tall, slender eucalyptus trees. They stretch from the factory gate, across the gentle undulations of Mato Grosso do Sul, a state in Brazil's centre-west, all the way to the horizon. “That's our competitive advantage,” explains

And from Ft.com...

**COMPANIES** Meet the pulp makers defying Brazil’s gloom

January 5, 2016

Few outside Brazil may have heard of Suzano, Klabin or Fibria. But for astute investors,
Six months later...

Where is the value to the shareholders?

Industry with low profitability and one of the worst ROIC

Walter Schalka, Suzano CEO, November 2016
Fibria financials (operating results)

Source: Fibria quarterly statements, balances extracted by Hawkins Wright
Volatility is the challenge/opportunity of all commodity players

Pulp prices v commodity indices

Source: Hawkins Wright, IMF, The Economist
And yet…

The time span of an elephant’s memory: 100 years

The time span of a gold fish’s memory: 3 seconds
Pierre’s predictions from a year ago…

- China economy expanding steadily, but is it sustainable?
- OKI project…multiple scenarios
- Pulp demand continues to grow strongly, but over 10 million tonnes of capacity due online…
Led to the following assumptions for hardwood market in 2017…

BHKP market balance 2017, assumption in December 2016

PUMA, Guaiba, others

APP

APRIL

Fibria TL

Other

Net supply increase

Shipments

Surplus/deficit

PUMA started Mar’16

PL2 Dec, PL1 April?

Integrations and conversions
Revised assumptions...

2017 BHKP market balance - the reality

In addition, heavy maintenance schedules in Latam and Asia...

PUMA, Guaiba, others
APP
APRIL
CMPC Guaiba
Fibria TL
Fibria Aracruz
Net supply increase
Shipments
Surplus/deficit

5 mths out in 2017 = 600k?
Demand boom preceded supply-side revisions

- Over six months from October to March, Chinese pulp demand increased by 1.6 million tonnes = **3.2 million tonnes annualised**.
  
  ➢ "Trend" growth is 1.2 million tpa

World-20 BCP shipments to China
Y-o-y growth

PPPC estimates growth slowed dramatically in Q2.

Shipments remain +9.2% (+0.7 million t) Jan-Jul

Impact from the latest buying spree has yet to be revealed (will not become evident until late October)

*Source: PPCP*
A major price-inventory cycle has taken place throughout the Chinese manufacturing sector.

But momentum has now eased... Chinese inventory of paper and board has increased +20% y-t-d.

Other issues are now supporting Chinese pulp demand (currency, wastepaper imports, and obsolete capacity closures, seasonality, traders & pulp supply-restrictions...)

Underlying paper demand is not accelerating, and therefore the current rally is unlikely to last this time.
Fine paper prices

Uncoated woodfree prices as an index

Although China is seasonally strong, curtailment may be required to maintain paper prices.

Implies lower fibre consumption

Source: Hawkins Wright
Paper market strength may also impact supply-side...APP/OKI

Paper mill operating rates are a key factor in determining fibre availability from APP

We estimate APP group P&B production >13.5 million tonnes!

Inventory movements, furnish adjustments, pulp production levels across all plants, purchasing requirements all play a role
Hawkins Wright

Bleached chemical market pulp capacity 2017-21:
BSKP +2.2Mt, BHKP +3.8Mt = 6Mt

Source: Hawkins Wright

Includes: Äänekoski, Klabin, OKI, Fibria, Sodra, SCA
Excludes: all projects that have not yet satisfied all of their preconditions (e.g. financing, final board room approval etc.)
Summary...

Short-term
- Pulp prices will continue to go up and down in ways which are difficult to predict
- Above trend capacity growth 2015-2019, not yet reflected in production
- Exceptionally strong demand growth in China from Q4 2016, unlikely to be sustained

Longer-term
- Market pulp demand drivers remain solid (emerging market growth, tissue, graphic paper integration, declining RCF availability)
- Although certain projects could follow by 2021, none is confirmed. Truly “low-cost” projects are increasingly hard to find
- Gathering momentum in viscose sector presents additional upside risk to commodity pulp sector…
Exciting times in the viscose sector

- Cotton Linter
  - Pulp: 99%
- Dissolving wood pulp: 92-98%
- Fluff Pulp: 88%
- Paper Grade Pulp: 84-88%

**INPUT**

- 100 t of Green Wood
- Water
- Lignin 20-28%
- Cellulose 43-45%
  - Hemicellulose 27-30%

**COOKING PROCESS**

**BLEACHING PROCESS**

**OUTPUT**

- 17 t of specialty cellulose
- 20 t of rayon grade cellulose
- 25 t of fluff pulp
- 27 t of paper grade pulp

- Black liquor
- Inorganics/Organics
- Waste Treatment

- Organics - Energy
- Inorganics - Recovery
Viscose competes with cotton and polyester
Preliminary estimates suggest that the Texas floods have destroyed approximately 300,000 bales of cotton; this shouldn’t be significant enough to impact the global market. Futures have gone up, but should settle down once the uncertainty diminishes.

Impact from Indian floods remains unknown.

- Viscose demand remains buoyant despite re-establishing a pricing premium over cotton
- Viscose is becoming increasingly valued as a blend with cotton and lower priced polyester
Pulp prices vs. other commodities

Source: Hawkins Wright
Chemical cellulose and paper grade pulp demand
Indexed since 1990

Source: Hawkins Wright
DWP demand rises by 3 million tonnes in 10 years

- China accounts for 52% of DWP demand in 2016, and 91% of growth
- Rising DWP demand and higher margins are encouraging conversions of kraft pulp mills
- APRIL/Sateri have especially ambitious plans

World chemical cellulose demand, 2000-16

Chemical cellulose (including cotton linter)

Rayon grade, 5,130

Acetate, 620

Ethers, 600

Others, 150

Other, 1,370

Source: Hawkins Wright Estimates
DWP demand +8% y-t-d (Jan-June 2017) Driven by China (+16%)

Commodity grade DWP shipments by quarter

<table>
<thead>
<tr>
<th></th>
<th>6 months</th>
<th>% change</th>
<th>Growth in 000s t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2016</td>
<td>2017</td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>295</td>
<td>275</td>
<td>-7%</td>
</tr>
<tr>
<td>West Europe</td>
<td>415</td>
<td>415</td>
<td>+0%</td>
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<td>Japan</td>
<td>80</td>
<td>85</td>
<td>+6%</td>
</tr>
<tr>
<td>China</td>
<td>1,485</td>
<td>1,730</td>
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<tr>
<td>India</td>
<td>305</td>
<td>320</td>
<td>+5%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>240</td>
<td>265</td>
<td>+10%</td>
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<tr>
<td>Thailand</td>
<td>70</td>
<td>65</td>
<td>-7%</td>
</tr>
<tr>
<td>Other</td>
<td>75</td>
<td>40</td>
<td>-47%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,990</td>
<td>3,225</td>
<td>+8%</td>
</tr>
</tbody>
</table>

Of which

| Specialty Viscose | 590 | 610 | +3% | +20 |
| Viscose          | 2,400 | 2,615 | +9% | +215|

Source: Hawkins Wright

Dominant features:
Commodity grade DWP
- Resurgent VSF markets

Specialty grade DWP
- Consumer destocking coming to an end
Chinese cotton linter pulp production
2000-2016

Source: Hawkins Wright
4 million t/y of paper grade pulp conversions committed, with more to come…

<table>
<thead>
<tr>
<th>Year</th>
<th>Company</th>
<th>Mill</th>
<th>Country</th>
<th>Impact on mkt pulp</th>
<th>Converted from</th>
<th>Date of conversion</th>
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<tbody>
<tr>
<td>2019</td>
<td>Arauco</td>
<td>Valdivia</td>
<td>Chile</td>
<td>-550</td>
<td>BSKP</td>
<td>Q2 2019</td>
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<td>Rizhao</td>
<td>China</td>
<td>-300</td>
<td>BKP</td>
<td>2016</td>
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<tr>
<td></td>
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<td>Kerinci</td>
<td>Indonesia</td>
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<td>BHKP</td>
<td>2016-</td>
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<td>2013</td>
<td>Buckeye Technologies</td>
<td>Perry</td>
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<td>Fluff</td>
<td>Q1 2013</td>
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<td>Austria</td>
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<td>Paskov</td>
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<td>Jesup</td>
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<td>SAPPI</td>
<td>Ngodwana</td>
<td>South Africa</td>
<td>-235</td>
<td>BSKP</td>
<td>Q3 2013</td>
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<td>SCG Paper</td>
<td>Nam Phong</td>
<td>Thailand</td>
<td>-110</td>
<td>BHKP</td>
<td>Q4-2013</td>
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<tr>
<td>2012</td>
<td>Altri</td>
<td>Caima</td>
<td>Portugal</td>
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<td>Sulphite</td>
<td>Q1 2012</td>
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<td>Yanzhou</td>
<td>China</td>
<td>-300</td>
<td>BHKP</td>
<td>Q1 2012</td>
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<td></td>
<td>Stora Enso</td>
<td>Enocel</td>
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<td>-200</td>
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<tr>
<td></td>
<td>Sodra Cell</td>
<td>Morrum</td>
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<td>-200</td>
<td>BHKP</td>
<td>Q1 2012</td>
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<td>Thurso</td>
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<td>Paper Excellence</td>
<td>Prince Albert</td>
<td>Canada</td>
<td>NBSK</td>
<td>n/a</td>
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**TOTAL 2011-2019** | **-4,020**

Plus hybrid grades from other kraft pulp mills
Net price differentials
BSKP and BHKP vs. DWP

Swing capacity may revert to kraft pulp when differentials fall...

Source: Hawkins Wright Estimates
Price differentials also impact on demand side….

**Paper grade pulp used as an extender**

Source: Hawkins Wright

Paper grade pulp usage as DP extender estimated at 0.4-0.5 Mt in 2016.

Yibin Heist, Fulida, Tangshan Sanyou imported 0.6Mt kraft pulp in 2016.
Viscose & DWP summary

- Textile demand underpinned by demographic and economic trends; few substitutes!
- As viscose technology improves and gains market acceptance, so the economic and sustainability case versus cotton and polyester grows…

- Nevertheless, market is competitive and supply and demand are price sensitive
- Market potential is huge, but current demand is relatively small, so new supply must be introduced carefully. Furthermore, Sateri accounts for ~50% of growth in viscose capacity
- Dependence on China presents a further risk, particularly in light of government interference in cotton and DWP trade policy

- The sector will continue to have a major impact on supply & demand for commodity grade pulps