Global Trends in Market Pulp

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Maine Forest Products Council
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Presentation outline

- Global pulp market profile
- Demand/supply and pricing outlook through 2019
- Important issues and trends
  - Continued ascendance of China
  - Decline but not the fall of print
  - Surging tissue consumption
  - Specialty papers solid growth
  - Peak recovered paper
  - Micro-plastics water pollution good for pulp
**Market Pulp: 65 mm tonnes, $50 billion business**

Intermediate product used to make paper (84%), hygienic goods e.g. Diapers, pads, wipes (8%), textiles/specialties (8%)

Production processes - chemical (cooking – 94%) and mechanical (grinding – 6%)

Differentiated by wood species – soft & hard
Market pulp gaining share of global fiber furnish

Source: PPI, Brian McClay & Associates
Capacity surge in China, 85% non-integrated to fibre

Changes in paper & paperboard output by region 2003 - 2013

Source: FAO, PPI, Brian McClay & Associates
Paper still a growth business, China now 26% of total
N American end-uses for BSK and BHK - 2013 (2007)

BSK

- Fluff: 24% (19%)
- Tissue: 40% (29%)
- Specialties: 16% (8%)

BHK

- Tissue: 68% (54%)
- P&W: 18% (30%)
- Specialties: 9% (12%)

Sources: Brian McClay & Associates Inc., PPP, Poyry
World Annual Market Pulp¹ Shipments by Grade

(000's tonnes, est.)

Sources: PPPC, Company Info, GTADATA, B McClay & Associates Inc.
1) All chemical and mechanical grades

BEK
(2014/2013 % ch. = 8.6%)

NBSK
(-1.7%)

Other BHK
(-7.2%)

Other BSK
(1.4%)

High Yield (80% BCTMP)
(-0.8%)

Sulfite
(-7%)

UKP (+0.5%)
World Paper Grade Market Pulp Shipments by Destination

(000's tonnes, est.)

Sources: PPPC, Company Info, GTADATA, B McClay & Associates Inc.
1) All chemical and mechanical grades

Europe
(2014/2013 % ch. = -0.2%)

China
(+3.9%)

North America
(-0.4%)

Others
(-0.2%)

Latin America
(4.8%)

Japan
(-0.5%)
Selected Hardwood Market Pulp Capacity Changes 2014 - 2019
June 2015

- Metsä Fibre: Kaskinen, Finland (-200 Kt BCTMP; late 2015)
- Metsä Group: Äänekoski, Finland (1.3 MMT NSK/BHK; Q3 2017)
- UPM: Kymi, Finland (170 Kt BHK/NBSK; H2 2015)
- Svetlogorski: Belarus (400 Kt BSK/BHK/DP; 2016)
- APP: South Sumatra, Indonesia (2.5 MMT BEK; end 2016)
- Portucel Soporcel: Mozambique (na BEK; 2018-2020)
- Eldorado Celulose e Papel: Tres Lagos II, Brazil (2 MMT BEK; Q1 2018)
- CMPC: Guaiba, RS, Brazil (1.5 MMT BEK; May 3, 2015)
- Arauco: Arauco, Chile (1.3 MMT BEK; ND)
- Klabin: Parana state, Brazil (1.1 MMT BEK, 400 Kt BSK/Fluff; May 2016)
- Fibria: Tres Lagos II, Brazil (1.75 MMT BEK; Q4 2017)
- Resolute Forest Products: Calhoun, TN (100 Kt BHK; end 2015)
- Paper Excellence: Chetwynd, BC (240 Kt BCTMP(H); May 2015)

Legend:
- Confirmed Increase
- Uncertain/Could be delayed
- Confirmed Decrease

ND = Date not determined
Extremely low cost Eucalyptus plantations is the key
Low cost, high quality pulpwood and lots of it
World Market Pulp Capacity Through 2019

Bleached Hardwood Kraft (BHK)  
(5.9% aagr 2015-2019)

Bleached Softwood Kraft (BSK)  
(3.2% aagr 2015-2019) includes fluff

Source: Brian McClay & Associates Inc., PPCP  
September 2015
Bleached Hardwood Kraft Market Pulp

World demand & capacity annual changes with demand/capacity ratio

Source: Brian McClay & Associates Inc. August 24, 2015
Bleached Softwood Kraft Market Pulp
World demand & capacity annual changes with demand/capacity ratio

Source: Brian McClay & Associates Inc. August 24, 2015
Quarterly NBSK/BEK US$ Prices in N America - 2019

Gross Prices Delivered Mill, Actual Prices Through Q2 2015

<table>
<thead>
<tr>
<th></th>
<th>NBSK</th>
<th>BEK</th>
<th>Aspen</th>
</tr>
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<tbody>
<tr>
<td>2014</td>
<td>1026</td>
<td>849</td>
<td>855</td>
</tr>
<tr>
<td>2015</td>
<td>972</td>
<td>883</td>
<td>863</td>
</tr>
<tr>
<td>2016</td>
<td>992</td>
<td>880</td>
<td>860</td>
</tr>
<tr>
<td>2017</td>
<td>946</td>
<td>828</td>
<td>803</td>
</tr>
<tr>
<td>2018</td>
<td>881</td>
<td>775</td>
<td>760</td>
</tr>
<tr>
<td>2019</td>
<td>958</td>
<td>840</td>
<td>825</td>
</tr>
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</table>

Source: Brian McClay & Associates Inc. - September 12, 2015

Red font = change from last forecast - August 11, 2015


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<thead>
<tr>
<th></th>
<th>C$</th>
<th>Euro</th>
<th>Real</th>
<th>CNY</th>
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<tbody>
<tr>
<td>2014</td>
<td>0.91</td>
<td>1.33</td>
<td>.430</td>
<td>.162</td>
</tr>
<tr>
<td>2015</td>
<td>0.79</td>
<td>1.10</td>
<td>.310</td>
<td>.159</td>
</tr>
<tr>
<td>2016</td>
<td>0.80</td>
<td>1.10</td>
<td>.290</td>
<td>.155</td>
</tr>
<tr>
<td>2017</td>
<td>0.85</td>
<td>1.15</td>
<td>.320</td>
<td>.162</td>
</tr>
<tr>
<td>2018</td>
<td>0.88</td>
<td>1.20</td>
<td>.360</td>
<td>.170</td>
</tr>
<tr>
<td>2019</td>
<td>0.90</td>
<td>1.22</td>
<td>.380</td>
<td>.176</td>
</tr>
</tbody>
</table>
Even with modest aagr of 4.6%, China’s paper & board output will reach 180 million tonnes in 2023, 65 m tonnes over 2013.
Building airports in China does not use much paper
But using airports does
Emerging markets have good paper growth prospects.

The graph shows per capita paper and board consumption for various countries in 2002 and 2013. Notable countries include:

- **World**: Generally lower consumption per person.
- **Nigeria**, **India**, **Indon...** (likely Indonesia): Lower consumption.
- **MidEast**: Somewhat lower consumption.
- **Russia**, **Brazil**, **Turkey**: Moderate consumption.
- **China**: Higher consumption.
- **Canada**, **Korea**, **Finland**, **Sweden**, **Japan**, **USA**, **Belgium**: Higher consumption, with Belgium being the highest among the listed countries.

The data indicates that while some countries have relatively low consumption of paper and board, others, particularly in emerging markets, show promising growth prospects.
World Printing & Writing Paper Demand by Grade

Million Tonnes

Sources: PPPC, PPI Annual Review, B McClay & Associates Inc.

Uncoated Wood Free
(aagr 2003-2013=0.6%)

Coated Woodfree
(aagr 2003-2013=0.2%)

Coated Mechanical
(aagr 2003-2013=-1.7%)

Uncoated Mechanical
(aagr 2003-2013=-1.5%)
Print still important, screens a crowded space

Ad nausea
Adblock users per month, m

Source: PageFair, Adobe

Economist.com
“the more cheap and easy uses of technology permeate our culture, the more valuable are the moments of real-world interaction”

Richard Moross, CEO Mohawk Paper
Per Capita Tissue Paper Consumption

World
Nigeria
India
Indonesia
MidEast
Russia
Turkey
China
Brazil
Mexico
Korea
Japan
Germany
Sweden
Canada
USA

% toweling/total consumer tissue
1) Japan = % toweling/all tissue

kg per person

0 5 10 15 20 25 30

0.6%

Brian McClay & Associates Inc.
Print may be seen as old, tissue is modern, sophisticated
Potential upside to toweling use due to health concerns
Some long-shot risks to wood pulp in tissue
Growing Specialty Paper business is NBSK-centric

Global Specialty Papers - 25 million tonnes

- Filtration: 55%
- Construction/building
- Medical
- Decor
- Industrial/Tape: 25%
- Label: 10%
- Food: 5%
- 5%
Faux leather patch – 100% NBSK saturated with latex
Peak Recovered Paper

- Graphic paper use down in U.S., EU and Japan – less to recover
- Already high recovery rates? U.S. 72%, Europe 77%, Japan 81%
- Raising recovery rates elsewhere – not enough to offset loss above
- More specialty papers, food grades, composites, not as recoverable
- Marginal cost of collection rising – deeper into the waste stream
- Quality of marginal supply declining – e.g. single stream recovery
- Tissue demand growing fast (4.5%), potential recovery rate lower.
Peak Recovered Paper

Supply growth slows, quality declines, costs rise – market pulp gains share
Dissolving pulp is a 6 million t/y, ~$6 billion business

Market pulp industry (1)
- Total: 63 MMT

Cellulose Specialties segment
- Total: 1.6 MMT
  - High Strength Viscose and Specialty High Value: ~355,000 MT
  - Ethers: ~503,000 MT*
  - Acetate: ~710,000 MT

Increasing Specialization
History of Cellulosic Fibers Production

million tonnes

Good growth prospects for dissolving pulp (DP)

- China, India surging consumer classes
- Peak cotton
- Sustainability – land and water use, virtuous forest products loop
- World demand for textile fibres growing 3% per year
- Dissolving pulp based fibres 4% of total textiles, huge leverage
- If DP got all textile growth, would need 2.7 million tonnes/year
- DP demand growth rate at 6-8%/y, (RISI has 10%)
- More volatile business, cotton new variable, need to hedge pricing risk
Good growth prospects for dissolving pulp (DP)

Jean use 17% of world cotton fabric
4.5 million tonnes per year
Tencel (Lenzing) gaining share
Sustainability marketing
There's a great future in plastics.
Plastic pollution in the oceans consumed by corals

Posted Mar 2, 2015 by Tim Sandle

Scientists studying Australia’s Great Barrier Reef have discovered that coral will eat microplastic pollution. Microplastics are the remains of plastic pollution discarded into the oceans.

As Digital Journal has previously reported, many parts of the world’s oceans are replete with plastic junk — the waste products of modern life. Plastic is now the main form of ocean debris, causing serious concerns about its impact on the health of ocean communities.

Corals are not especially fussy about what they consume, and they will...
Plastic starting to choke the world’s oceans

9 million tonnes of plastic into world’s oceans every year

Dr. Mark Anthony Brown: *Current Biology* Volume 23, Issue 23

85% of ocean solid waste pollution is micro-plastics – ocean smog

Linked to polyester textile fibres – non-biodegradable, toxic

1900 micro-fibrils released each washing of polyester garment

No effective way to screen, must stop at source

Illinois and New Jersey ban products with micro-plastic beads
Market Share of Major Fiber Types

Year | Natural | Cellulosics | Synthetics
--- | --- | --- | ---
1965 |  |  | 100%
1970 |  |  | 100%
1975 |  |  | 100%
1980 |  |  | 100%
1985 |  |  | 100%
1990 |  |  | 100%
1995 |  |  | 100%
2000 |  |  | 100%
2005 |  |  | 100%
2010 |  |  | 100%
2013 |  |  | 100%
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