Trends and Developments in the Chinese Pulp and Paper Industry

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Agenda

- Paper and paperboard consumption
  - Will the growth continue?

- Production and capacity additions
  - Where will the production be located and who will operate it?

- Future fibre supply
  - Is there enough fibre? Where will it come from?
Global Consulting and Engineering Group

- Client- and technology-oriented globally operating consulting and engineering firm
- Core operations based on three know-how clusters:
  1. forest industry
  2. energy, and
  3. infrastructure & environment
- Global market leader in forest industry
- Strong international position
Paper and paperboard consumption

Production and capacity additions

Future fibre supply

Will the growth continue?
Global Paper and Board Consumption

Over the past 23 years, global paper and paperboard consumption has grown 3.0% a year or a total of 165 million tons.
Co-existence of Media

Historically, electronic media has not threatened the growth of paper based communication – in many cases the paper industry has benefited from it.

- Paper consumption, million t/a -

Newsprint and pr/wr paper consumption in Western Europe

- Expansion of Internet/WWW
- CD-ROMs
- Laser Printers
- Mainframe Computers
- Satellite TV
- Mini Computers
- Colour TV
- Cable TV
- VCR
- PCs
- Newsprint
- Printing and writing papers

Radio Cinema TV
Innovations and Paper-based Packaging

Paper remains a very competitive packaging material. New innovations and applications help maintain its position against other materials and systems.
GDP Growth by Region

...and the rapid economic growth in Asia will underpin the growth in paper consumption.

Source: Consensus Forecasts and OECD
World Demand for Paper and Paperboard

World demand for paper and paperboard continues to grow. With an average growth rate of 2.2 percents a year, it will reach 450 million tons by the year 2015.
Growth of Paper and Paperboard Demand

Most of the growth will take place in more volatile emerging markets.

Emerging Growth Markets

Traditional Strongholds

Share of consumption in 2000 (325 million tons), %
Growth of Paper and Paperboard Demand

Woodfree papers and tissue show highest growth rates, packaging boards account for substantial volume growth.
Paper and paperboard consumption

Production and capacity additions

Future fibre supply

Where will the production be located and who will operate it?
Consolidation and Globalization

Search for markets, assets and competitive advantage drive consolidation and globalization
Leading Global Paper and Paperboard Producers

Truly global companies are yet to emerge but many companies have by now established Asian presence.

Regional Capacity Distribution, 2004/I IQ

- Capacity, 1000 t/a -
The pulp and paper industry is still relatively fragmented with top five firms controlling only 20-40% of regional capacity.
Industry-level Benefits of Consolidation

Consolidation helps to bring price stability.

Price volatility vs. industry concentration

- Standard deviation, % -

Global price, regional concentration for pulp

- Concentration of Top 5, % -

Testliner
Uncoated woodfree
Newsprint
Kraftliner
LWC
BSKP
BHKP
SC
Changes in Investment Conduct

The past 10 years has been a decade of acquisitions.
Acquisition and Investment Activity

Consolidation has mainly taken place in developed, slow growing, mature markets. Asian companies are still growing through new investments.

North America, Europe and Japan

- Acquisitions: 45%
- Fixed Investments: 55%

China and Rest of Asia

- Acquisitions: 10%
- Fixed Investments: 90%

Source: JP Research
Global Capacity Growth

Non-Japan Asia’s share of global capacity investments has grown significantly

Source: JP Research
## Capacity Expansion Projects in China

*Over the next five years, China will lead the world in capacity growth.*

<table>
<thead>
<tr>
<th>Company</th>
<th>Capacity 1000 t/a</th>
<th>Grade</th>
<th>Location</th>
<th>Time</th>
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<tbody>
<tr>
<td>APP Ningxing Zhonghua</td>
<td>700</td>
<td>Duplex board</td>
<td>Zhejiang</td>
<td>2004</td>
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<td>Guangdong</td>
<td>2006/2007</td>
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<td>June 2004</td>
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<td>Guangdong</td>
<td>August 2004</td>
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<td>700</td>
<td>BI hardwood pulp</td>
<td>Guangdong</td>
<td>n.a.</td>
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</tbody>
</table>

**TOTAL ABOVE** 13730
Paper and paperboard consumption

Production and capacity additions

Future fibre supply

Is there enough fibre? Where will it come from?
World consumption of papermaking fibre is forecast to grow from 350 million tons in 2003 to 460 million tons by the year 2015, or 2.3%/a on average.
Average Papermaking Fibre Furnish in the World

Wood pulp is still the most important papermaking raw material, but recovered paper continuously increases its share of the total – today about 48% of the total.
Recovered Paper Collection and Consumption – 2003

North America is the great provider of recovered paper for Asia.

Western Europe 58% 50%
North America 40%
Non-Japan Asia 65%
Japan 0.7 0.4 2.0 2.7 1.5

Million tons

Recovery rate

Consumption
Collection
New Capacity in China

11 million tons of new papermaking capacity came on stream in China during the past three years. To keep these machines running requires nearly 8 million tons of recycled fibre as well as virgin wood pulp.

![Bar chart showing RCF required for different paper products in 2002, 2003, and 2004.](chart.png)
Recovered Paper Imports into Mainland China

Large part of the increase in consumption has come from imports.

Note: 2004 estimated based on Jan-Jul statistics.
Recovered Paper Imports into Mainland China

USA, Europe and Japan are the largest import sources, but they have just about reached their limits. Other countries cannot export more, either.

Note: 2004 estimated based on Jan-Jul statistics.
**Paper Recycling Water Wheel**

*Continuous additions of fibre are needed to offset losses.*

- **Virgin Wood Pulp**
- **Minerals and Additives**
  - Process Losses (deinking)

**Production of Paper**

**Consumption of Paper**

**Used for Paper Production**

**Collection of Paper**

**Recovered Paper Trade**

**Other Uses of Old Paper**

**Not Collected** (tissue, library books, burned, etc.)

**Paper Trade**

**Trade in Paper Products**

**Not Collected** (tissue, library books, burned, etc.)
**Paper and Paperboard Collection Cycle**

*Fibre quality decreases over time until it disappears in the recycling process.*

Without virgin fibre injection, paper & paperboard industry would run out of raw material within 6 months.

- Volume of raw material -
Growing Stock of Forests

There is plenty of wood in the World. It is just not all in the right places. China must secure a reliable and sustainable source of wood for its industry.

- Total 380 billion m³
- Softwood 126 billion m³
- Hardwood 254 billion m³

-billion m³-
Conclusions

- The global demand for paper and paperboard continues to grow
- The industry growth is shifting outside traditional supply areas, especially to Asia and increasingly to China
- The industry remains fragmented, especially in Asia
- Acquisitions have become an important driver of corporate growth, but capacity growth continues in China
- Recycled fibre will soon constitute over 50% of global paper industry’s fibre raw materials
- Traditional supply sources cannot continuously increase their exports of recovered paper
- Domestic collection must be developed and improved to meet a growing part of the fibre mix
- Non wood pulp must be developed into a viable alternative
- World has enough wood to meet the growing demand but it is not all located in the right places.
- China will have to develop sustainable source of wood to help meet its growing demand for fibre.