How Cost Competitive is Wood Pulp Production in South China?

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China’s growing demand for paper...
... means growing demand for wood pulp and other types of fiber

During 2000-2010:
- Nonwood fiber declining from 40% to 15% of total
- Waste paper growing from 40% to 58% to reach 35 m tonnes/yr in 2010
- Wood pulp growing from 20% to 25%, to reach 15 m tonnes/yr in 2010

Source: China Economic Consulting, 2004
China’s government is promoting development of wood pulp industry fed by fast-growing plantations.

**FGHY Plantation targets for 2001-2015**

Overall area: 13.1 million ha
Pulpwood plantations: 5.9 million ha (45%)

4 Priority Regions

- **Northeast/Inner Mongolia**: 7.2 million ha / 2.4 million ha
- **Middle/Lower Yellow River**: 1.0 million ha / 800,000 ha
- **Middle/Lower Yangtze**: 3.0 million ha / 1.3 million ha
- **South Coastal**: 1.9 million ha / 1.4 million ha
Coastal South China is the leading region for wood pulp industry development

Up to 5.0 m tonnes of pulp capacity is now ‘planned’ for Hainan, Guangdong, and Guangxi.

Can the region provide a fiber base to support this new capacity?

What are implications for local livelihoods?
Eucalyptus plantations are expanding rapidly in Hainan, Guangdong, and Guangxi.

Most expansion is occurring on collectively owned land, held by farmers and communities.
Productivity levels are highly variable. MAI’s range between 10-20 m³/ha/yr depending on site conditions and management practices.
Plantations are spread out and in small blocks, with poor infrastructure.
Most plantation expansion is now occurring on collective land

Guangxi: Asia Pulp and Paper

2004
2003
2002
2000
1999
1998
1997
1996

Unit: Hectare

- Collective Land
- Provincial forest farm
- Prefecture and counties land
- Other land
Key Question: How competitive is the delivered wood cost?

- Wood costs typically account for at 40-50% of pulp production costs, so are key to determining competitiveness vis-à-vis market pulp.

- Eucalypt plantations in South China are generally cost effective compared to other regions in China.

- However, wood costs in South China are considerably higher compared to Indonesia and Brasil – both of which export pulp to China.

- Increasingly, domestic pulp producers need to be competitive in a global market.
Estimated BHKP production and delivery cash costs, 4Q05 – Assumes US$ 30 per ton wood in S. China

At US$ 30 per ton of wood, South China producers are competitive with imports from Indonesia and Brasil.

Source: RISI for Indonesia and Brasil. China costs assume same costs as Indonesia for chemicals, energy, labor, and other; and 60% for delivery.
Estimated BHKP production and delivery cash costs, 4Q05 – Assumes US$ 45 per ton wood in S. China

If wood costs are US$ 45 per ton, South China producers will have difficulty competing with imports from Indonesia and Brasil.

Source: RISI for Indonesia and Brasil. China costs assume same costs as Indonesia for chemicals, energy, labor, and other; and 60% for delivery.
Pulp is a highly volatile commodity – high-cost producers will have difficulty competing during market down-cycles.

Source: Hawkins Wright March 2004 Outlook
Prices are c.i.f. delivered, forecast assumes constant exchange rates.
Wood cost in South China (1/2)

- In coastal South China, flat land suitable for mechanized plantation management is scarce

- Depending on site, cost of land rent = US$ 70 – 220/ha/yr

- These sites generally have lower development costs, easier logistics, and higher wood yields

Production costs of recovered wood
US$13 -18/m3 (standing, 1st rotation)
US$ 20 - 28 per tonne at mill gate in 2004-2005

For land rental price below RMB 55/mu/yr (approx US$ 100 /ha/yr)
Wood cost in South China (2/2)

• Most future plantation development will occur on labor-intensive hilly sites

• Cost of land rent is normally in the range of US$ 20-50 /ha/yr

• These sites generally require much more labor and higher fertilizer inputs

Production costs of recovered wood
US$13 -28/m3 (standing, 1st rotation)
US$ 32-44+ per tonne at mill gate in 2004-2005

For average land rental price of RMB 15/mu/yr (approx US$ 27/ha/yr)
Pulp mill competitiveness is heavily dependent on who controls the wood supply

Fuxing – UPM Kymmenes’s recent experience shows that a too high reliance on outside wood supply may render an entire wood pulp project non-viable

**Base Scenario**

<table>
<thead>
<tr>
<th>Self-managed plantations</th>
<th>50,000 ha of plantation established aiming to produce 40% of the wood requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9-year cycles with 2 harvests: year 5 (planted crop) and year 9 (coppiced crop)</td>
</tr>
<tr>
<td>‘Membership Programme’</td>
<td>Wood delivery: 122 tonnes at age 5 and 97 tonnes at age 9</td>
</tr>
<tr>
<td>Contracted plantations</td>
<td>90,000 ha delivering 12.5% of the overall wood requirement as re-payment of loans &amp; assistance. The rest of the production sold at market price</td>
</tr>
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<td></td>
<td>60,000 ha: Wood sold at market price</td>
</tr>
</tbody>
</table>
Pulp producers seek to control costs by maximizing self-managed areas.

An increase of USD 5 per green tonne of wood means an increase of USD 21 per tonne of pulp.
Local market prices for pulpwood and export-quality chips have risen steadily

Between September 2003 and November 2005:

- Wood chip price has increased from US$ 92 to US$ 115 per Bdu (bone-dry unit)
- Pulpwood price at mill gate has risen from US$ 36.5 to US$ 46 per ton
How much competition will there be for land and pulpwood?

Wood Chips Exports

Situation in 2003

The 3 provinces exported approximately 1.1 million Bdt of chips, equivalent to 2.3 million m³ of debarked wood.

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Wood Chips Exports + Supplies to APP–Hainan

Situation in 2005

Guangxi: 30,000 Bdt
100% eucalypts

Zhanjiang: 100,000 Bdt
100% eucalypts

and supplied APP – Hainan with approximately
0.63 million Bdt

Hainan: 500,000 Bdt
Eucalypts, acacias, casuarinas, others

The 3 provinces exported approximately
0.85 million Bdt

Bdt: Bone-dry tonne

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South China Pulpwood Demand -- Scenario 1

**Guangxi expansion**
- 600,000 Adt of CTMP
- 600,000 Adt of BHKP

**W. Guangdong project delayed**

1.2 m Adt of BHKP at APP-Hainan

Total pulpwood demand = 9 m m3/yr
Plantation area needed = 600,000 ha
South China Pulpwood Demand -- Scenario 2

- **Guangxi expansion**
  - 600,000 Adt of CTMP
  - 600,000 Adt of BHKP

- APP-Hainan expands to 2.2 m Adt/yr of BHKP

- W. Guangdong project delayed

- Total pulpwood demand = 13 m m3/yr
- Plantation area needed = 880,000 ha
South China Pulpwood Demand -- Scenario 3

**Guangxi expansion**
- 600,000 Adt of CTMP
- 600,000 Adt of BHKP

**APP-Hainan expands to**
- 2.2 m Adt/yr of BHKP

**700,000 Adt/yr capacity installed in W. Guangdong**

**Total pulpwood demand = 16 m m3/yr**
**Plantation area needed = 1.07 m ha**
# Eucalypt & acacia resources within ‘economic distance’ of planned & existing pulp mills

<table>
<thead>
<tr>
<th>Prefectures involved</th>
<th>Guangxi</th>
<th>Western Guangdong</th>
<th>Hainan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chongzuo, Fangchenggang, Nanning, Qinzhou, Beihai, Laibin, Guigong, Yuin, Wuzhou</td>
<td>Zhanjiang, Maoming, Yangjiang, Jiangmen, Yunfou</td>
<td>The entire province</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corresponding total land area</th>
<th>ha</th>
<th>10,567,925</th>
<th>4,905,400</th>
<th>3,390,768</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>Area of eucalypt and acacia stands/ woodlots at end of 2005</th>
<th>ha</th>
<th>Approx. 300,000</th>
<th>Approx. 245,000</th>
<th>Approx. 230,000</th>
</tr>
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</table>

| Rate of yearly planting | ha/y | 40,000 - 45,000 | 10,000 - 15,000 | Extremely variable |

| CIFOR’s assessment of Harvestable Volume in 2010 | m³ | 4.5 million | 3.6 million | 2 million |

**Sources**
Land for new plantations is very limited in Guangdong...
... and in Hainan

Land Potentially Available for Plantation Expansion

Coverage of land totally or partially unused 1/
(expressed in % of total land area)

Hainan

1/ Sparsely stocked forest stands, shrub areas and bare / degraded forest land
Land for new plantations is much more available in Guangxi.
Summary of key messages

- Feasibility of large pulp mills depends on building a sizeable plantation base to control yields and wood costs.

- Access to new plantation land is a slow and complex process, as most suitable land is held by farmer households or communities.

- On a limited basis, coastal Southern China could potentially become a new “world-class eucalypt pulp producer”. However, the type of land which is required for this is in very short supply and can support limited capacity.

- At present, the most common plantation type is ‘labor-intensive plantation on hills’. Most of the future plantation development is expected to occur on hill sites.

- Currently, ‘labor-intensive plantation on hills’ can produce small-diameter round wood (wood fiber) at competitive costs compared to imported wood fiber – but this could change if local wood prices rise by US$ 10-15 per ton.
Summary of key messages

- Increasing competition for land and fiber is already pushing up wood prices in local markets, and this can be expected to continue as new pulp capacity comes online -- although price increases may be partially offset by increasing supply and/or government subsidies.

- Overall, pulp production in South China is now only moderately competitive versus market pulp imports from Indonesia and Brasil.

- Increased production costs will make it harder for Chinese producers to compete with imports, particularly when world pulp prices are low.