THE CASE OF CHILE
COMPETITIVENESS OF THE CHILEAN FOREST INDUSTRY
ALDO CERDA, September 2007

THE GLOBAL CONTEXT OF THE FOREST INDUSTRY

- Top-100 annual turnover of 326 US$b
- Mature, average ROCE Top-100 is consistently stable of around 4-5% yearly
- Fragmented, Top-10 producers account less than 25% of global output

<table>
<thead>
<tr>
<th>REGION</th>
<th>Turnover</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>111,757</td>
<td>3,924</td>
</tr>
<tr>
<td>USA</td>
<td>98,346</td>
<td>2,803</td>
</tr>
<tr>
<td>Japan</td>
<td>40,632</td>
<td>830</td>
</tr>
<tr>
<td>Canada</td>
<td>25,914</td>
<td>890</td>
</tr>
<tr>
<td>Latin America</td>
<td>14,415</td>
<td>2,423</td>
</tr>
<tr>
<td>Non-Japan Asia</td>
<td>14,008</td>
<td>319</td>
</tr>
<tr>
<td>Australia / N. Zealand</td>
<td>13,161</td>
<td>288</td>
</tr>
<tr>
<td>South Africa</td>
<td>5,888</td>
<td>43</td>
</tr>
<tr>
<td>Total Top-100</td>
<td>325,873</td>
<td>11,520</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPANIES</th>
<th>Turnover</th>
<th>Net Income</th>
<th>ROCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Paper (1)</td>
<td>21,995</td>
<td>1,100</td>
<td>5.3%</td>
</tr>
<tr>
<td>Next Top-4, average</td>
<td>15,819</td>
<td>512</td>
<td>5.0%</td>
</tr>
<tr>
<td>Top-10 average</td>
<td>13,359</td>
<td>327</td>
<td>4.3%</td>
</tr>
<tr>
<td>Paperlink (14),Australia-</td>
<td>5,574</td>
<td>49</td>
<td>3.8%</td>
</tr>
<tr>
<td>Amcor (15), Australia</td>
<td>5,441</td>
<td>136</td>
<td>7.3%</td>
</tr>
<tr>
<td>Aracoco (36), Chile</td>
<td>2,850</td>
<td>619</td>
<td>10.2%</td>
</tr>
<tr>
<td>CMPC (41), Chile</td>
<td>2,260</td>
<td>205</td>
<td>4.3%</td>
</tr>
<tr>
<td>Carter Holt Harvey (45), NZ-</td>
<td>2,146</td>
<td>103</td>
<td>3.7%</td>
</tr>
<tr>
<td>Masaia (87), Chile</td>
<td>887</td>
<td>30</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Note: Kimberly Clark and Procter and Gamble have been excluded.
THE GLOBAL CONTEXT OF THE FOREST INDUSTRY

- Wood accounts 40-75% of the total cost of production of forest products (pulp, sawn wood, boards). A fast-growing resource explains: a) why the industry is moving from North to South - reinvestment rate in North America, Japan and Europe does not overcome depreciation- and b) the new development strategy of forestry in China (to "the edges")

- American producers are "leaving" the forests to TIMOs, for "liquefying" assets and focusing on distribution channels.

- Our business has a major logistical component, and as the Cokett Bunker Price Index shows, margins have been affected by a systematic increase on freight rates -a major reason to believe in fairly stable higher prices in the future-. 

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THE GLOBAL CONTEXT OF THE FOREST INDUSTRY

- Wood supply has its major potential of expansion from Russia and Argentina. However, in both cases, "institutional deficiencies" make difficult to make viable such opportunity.

- To the contrary of other industries, here M & As are less developed since private equity look for high, short term gains, and because there is a lack of real global players to be associated with.

There is "space" for a truly global player to consolidate the industry, probably coming from the Southern Hemisphere.
FORESTRY: ENDOGENOUS DRIVERS OF CHANGE

- Biotechnology, for sure. It is estimated that new plantations in USA will reduce the economic wood cost supply by 40%. Brazil has a decisive advantage on pulp based on that -6 year rotation age- and intensively application of biotec tools.
- EWP
- Modeling: to know internal quality of logs before harvesting
- The key question: in a world where TIMOs own the forests but not the industry, how to secure the capture of such value creation?

FORESTRY: EXOGENOUS DRIVERS OF CHANGE
THE CHILEAN FOREST INDUSTRY

- 98% based on plantations, highly concentrated.
- "Commodity-oriented"
- Progressive attrition of medium and small players' role. They used to be the most active in product and market development.
- Exports would account for over 4.5 US$b in 2007. In Chile, profits of forest corporations lead every ranking, with the exception of mining.
- Natural forests with productive potential - some 4 million ha- is highly degraded. CMPC and Arauco signed in 2003 an agreement with NGOs for not using their natural forests, nor to generate indirect incentives for conversion. However, with proper silvicultural management, in a decade natural forests would level economic importance of today’s Eucalyptus base.

THE CHILEAN FOREST INDUSTRY

- Long term availability of Radiata Pine is limited.
- Since 1995, the area planted has been fairly stable -1.4 million ha-. New afforestation has been leveled by reforestation’s substitution to Eucalyptus.
- It is foreseen a "zero growth" scenario.
• In the case of Eucalyptus resource, the situation is more promising even though pulp mill capacity growth in the last 3 years will cope supply at least until 2012.
• Latest info available shows that ratio among *globulus* and *nitens* will favor the latter.

![Graph showing the availability of forest resources](image1)

• For pine pulpwood, there is a shortage of fiber of some 1 to 2 million m³.
• Given the fact that Arauco, CMPC and Masisa get an important portion of wood from third parties, such foreseen deficit has produced a dramatic intensification of competence for Pine plantation ownership and a progressive use of small diameter saw logs for pulp production.

![Graph showing the demand and availability of forest resources](image2)
• At least to 2010, the balance of supply and demand in the case of Eucalyptus is pretty tight also.
• The (un)balances will be solved basically shortening third-party rotation age, for taking advantage of better wood prices.

• The shortage of wood is changing the absolute advantage on cost for pulp production that Chileans do enjoy today.
• Some 50 US$/ton will be added on the production cost just for higher wood prices.
• Why to focus just in pulp? Because pulp is the definitive flagship of the Chilean forest industry.
• Given the shortage of Pine in Brazil, the loss of competitiveness has been less dramatic than it could have been, but in the case of Eucalyptus is much evident.
THE CHILEAN FOREST INDUSTRY

• Business as usual, Chilean industry has concrete constraints for growing in Chile.
• Argentina is discarded. Uruguay is too crowded. Brazil is the likely target. Arauco is finishing a deal with Stora Enso for a JV based on IP’s assets.
• Colombia? Too dangerous, despite the apparent enthusiasm.
• Rest of LA? Culturally, too different. Peru an option?

WHAT IS FUNDACION CHILE DOING?

The most entrepreneurial company in Chile is a private non profit institution: Fundación Chile... Its institutional setting has attracted high caliber staff and outstanding management. The Fundación Chile has been singularly successful in virtually all its endeavors, creating a reputation for excellence internationally. The challenge for the government is how to scale up and replicate what the Fundación does well (The World Bank Institute, 2003)

• We operate developing new businesses that "fill the gaps".
• We do not compete with actual producers: we a) introduce new products and technologies to Chile, b) reduce information asymmetries or c) change the framework where the business work.
• Our goal: to improve Chilean competitiveness
BIOENERGY: SCALING UP WOOD PELLETS

Private Investment Fund on BioEnergy

Fund’s Management (FCH)

Wood Pellet Company 1
Anchor Partner 1

Wood Pellet Company 2
Anchor Partner 2

Wood Pellet Company n
Anchor Partner n

CARBON FORESTS

Climate Crisis: “Ten things to take action”

9. Plant a tree...plant lots of trees!
### NATURAL FORESTS - ECOMANAGEMENT & TRADING

#### TODAY’S WOOD SUPPLY FROM NATURAL FORESTS

- **High Quality Wood (20%)**
- **Medium Quality Wood (40%)**
- **Low Quality Wood (40%)**

#### Sawn Wood, Boards, Flooring
- **Panels**
- **OSB, Pulp?, Biomass**
- **Biomass**
- **Bioenergy**
- **Pellets, CHP, Carbon credits**

#### Marketing Campaigns

### BIOTECHNOLOGY

- **Consorcio Genómica Forestal 2006-2010**, where Fundación Chile leads the GE Program.
- **NeoSylva**: clonal program for Radiata Pine. Through a venture with Arauco and Cellfor, this company has the exclusivity for selling to third parties Arauco’s top clonal material.
- **Today: expansion to Argentina and Uruguay?**
TACKLING THE "MAPUCHE PROBLEM"

- Creation of a company jointly owned by mapuche and non-mapuche owners of land in a win-win situation where a big area of supply can afford an industrial base to be developed.
- Fundación Chile will serve as honest broker: a) valuing assets contributing to the venture; b) training managerial team; c) managing key issues, mostly commercial, and d) make the financing viable for a value added, not minimal cost, venture.

<table>
<thead>
<tr>
<th>ESCENARIOS DE PROPUESTA</th>
<th>US$/ha-año</th>
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<tbody>
<tr>
<td>ESCENARIO BASE</td>
<td>80-120</td>
</tr>
<tr>
<td>Cultivo trifuegro tradicional</td>
<td></td>
</tr>
<tr>
<td>ESCENARIO FORESTAL</td>
<td>160</td>
</tr>
<tr>
<td>Silvicultura Avanzada</td>
<td></td>
</tr>
<tr>
<td>ESCENARIO FORESTAL INTEGRADO</td>
<td>345</td>
</tr>
<tr>
<td>Silvicultura+Integración Industrial</td>
<td></td>
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</tbody>
</table>

VALUE-ADDED PRODUCTS

- Scarcity poses a restriction and an opportunity.
- Radiata Pine EWP has lots of markets niches to exploit.
Timber as a growing asset class

“HE PLANTS trees to benefit another generation” said Caecilius Statius, a Roman comic poet. The sentiment remains admirable, but modern investors are putting money into trees to reap benefits in the nearer term. A growing number of rich individuals, endowments and pension funds are including timber as a “hard asset” in portfolios.

No wonder. Average annual returns on timber—meaning managed preserves that are eventually harvested—have outstripped those from leading global stock indices, property, oil and gold for the past decade. Worldwide, timber has attracted more than $20 billion of investment from institutional investors. Advocates say managed timber reserves are good for the environment too, preserving biodiversity on lands that might otherwise be logged recklessly.

Investor interest is strongest in America, where imaginative university endowment funds have embraced timber along with other “alternative” assets. The trend has spread more recently to Europe. Phoenix, a new timber fund, raised $115m when it listed in London last month. Investors backing it include the London Pension Funds Authority, F&C Asset Management, and a Swedish pension fund.

Trees typically take decades to mature, making them especially appealing to institutions, such as pension funds, which are looking for investments to offset long-term liabilities. Returns are not correlated with those on stocks, and yields are predictable. There are risks, of course. Foremost among them is potential exposure to any general economic downturn, which would tend to cut demand for wood, pulp and paper.

As more money has moved in, returns on timber in developed markets have fallen, pushing investors towards other corners of the world. Actis, an investment firm that focuses on emerging markets, has a $52m agribusiness fund with about one-third of its portfolio invested in or committed to timber preserves in Africa. These include a teak plantation in Tanzania, and a teak and hardwood plantation in south-west Sudan. “Even with 25 years of civil war, trees grow,” says Michael Turner, a partner who manages the fund. Actis is considering additional timber assets into Kenya, Uganda, Zambia and Congo. As “green” awareness rises around the world, timber looks more attractive than ever. It offers potential for tapping into the trading of carbon offsets, though any markets here are as yet immature.

Even governments with dodgy environmental records are being tempted by the potential gains from managed timber reserves. If they provide adequate conditions for investment mainly, a respect for title, and for the law of contract everyone will benefit. Once in a while, money really does grow on trees.”