

Wood Pulp Sector

Insatiable Chinese appetite for fiber and pulp

In this report, we discuss the global demand and supply of market wood pulp as well as the global pulp price trend. We focus on China's strong demand for paper and paperboards and the underlying need for China to procure more wood fiber and Bleached Hardwood Kraft Pulp (BHKP) from overseas. We highlight two companies as proxies to China's appetite for fiber and pulp and reiterate our BUY calls on United Fiber System (UFS) and Guangzhao Industrial Forest Biotechnology Group (GIFB).

- **China's demand for paper is driving robust demand for BHK Pulp.** From 1990 to 2003, China's demand for printing and writing paper, which are the main uses of BHK pulp, grew at a CAGR of 9.1%. This is expected to continue to grow strongly at 6.8% CAGR from 2005 to 2010. With limited supply of recovered paper pulp, China's demand for BHK pulp is expected to grow at a CAGR of 11.7% from 2005-2010, up from 2.9m tonnes in 2005 to over 6.1m tonnes in 2010. However, China's lack of wood fiber domestically means that it may have to continue to rely on imported wood fiber and pulp to meet this demand.

- **Growing importance of low-cost BHKP producers from Brazil and Indonesia.** Pulp prices are on a long-term downward trend, primarily the result of larger mills being built. These mills are more efficient and technologically advanced, thereby lowering costs. At the same time, with most of the investments in low cost regions such as Latin America and Southeast Asia focused on Fast-Growing, High Yield plantations such as eucalyptus and/or acacia, costs of production are also falling. Going forward, producers from low-cost regions like Brazil and Indonesia could displace higher cost producers from North America and Europe, especially since supply is expected to exceed demand over the next few years.

- **Reiterate BUY on United Fiber System (UFS) and Guangzhao Industrial Forest (GIFB).** We like UFS and GIFB because they are both beneficiaries of China's appetite for fiber and pulp. UFS has the potential to become Indonesia's third largest pulp producer, and is also in the midst of completing a wood chip mill, which has an off-take agreement with China National Machinery and Equipment Import and Export Corporation to buy 80% of UFS' wood chip production. Our target price for UFS is S\$0.545. We also like GIFB as a unique long-term play on the growing demand for paper in China and the lack of wood fiber domestically. It is poised to tap on this demand with its fast-growing poplar. GIFB is expected to begin cultivation of its salt-tolerant poplar this year, which should lower costs substantially whilst addressing the issue of land scarcity in China due to competition with cash crops. Our target price for GIFB is S\$0.365.

- **Key risk factor for both companies - Execution.** Our target price for both UFS and GIFB are at a substantial discount to their potential values of S\$0.90 and S\$0.525 respectively. This reflects the additional potential upside in these stocks as well as the high execution risks of these businesses.

Valuation Table

Company	Bloomberg Ticker	Rating	Target Price	Last Price	FY04	PE (x)	FY05	FY06	FY04 P/B (x)	FY05 Yield (%)
UFS	UFS SP	BUY	S\$0.545	S\$0.39	974	345	77	77	1.6	0
GIFB	GIFB SP	BUY	S\$0.365	S\$0.25	14.4	9.2	3.5	3.5	9.3	0

Source: Bloomberg, DBS Vickers

At a Glance

STI: 2,292.92

Sector: Wood Pulp

Reason for Report:
Sector update

Implications:
Neutral

Highlights

- **Wood provides 90% of fiber source for pulp production.** Pulp, which is primarily used in the manufacture of paper and paperboards, is a product that can be mechanically or chemically manufactured from a wide variety of plant material such as wood, straw bamboo, flax, hemp and cotton. Wood currently accounts for 90% of the fiber used for pulp production.
- **Wood pulp is a US\$23bn p.a. industry.** A globally traded commodity, 93% of the world market comprises chemical pulp, and the balance high yield pulp. When sold in the open market, it is referred to as market pulp. At an average price of US\$520 per tonne in 2004 and with an estimated 44–45m tonnes delivered, the global market pulp industry was worth c. US\$23bn in 2004.

Historical Demand for Market Pulp Globally

Thousand Tonnes	China	Rest of World	Total
1997	1,427	35,315	36,742
1998	2,054	35,334	37,388
1999	2,942	36,991	39,933
2000	2,823	37,360	40,183
2001	4,739	35,645	40,384
2002	5,021	36,430	41,451
2003	5,720	38,760	44,480
CAGR	26.0%	1.6%	3.2%

Source: 'Defining the China Market for pulp, paper and board' Hawkins Wright

- **Demand growth has been, and will be, driven by China.** China's total paper consumption is currently about half that of the U.S., with per capita consumption at less than 15% that of the US. Per capita consumption of paper in the US and China is 675 pounds and 82 pounds p.a. respectively. With the rising affluence of the Chinese, the long-term growth rate of China's market is expected to outpace the rest of the world.

Forecasted Demand for Market Pulp Globally

'000 Tonnes	China	Rest of World	Total Demand	Global Capacity	Demand / Supply
2003	5,876	39,008	44,884	47,990	93.5%
2008	8,825	42,248	51,073	56,470	90.4%
CAGR	8.5%	1.6%	2.6%	3.3%	

Source: 'Defining the China Market for pulp, paper and board' Hawkins Wright

- **China's pulp demand expected to be robust at 8.5% CAGR.** This would account for almost 50% of the world's increase in demand until 2008. Global capacity is also expected to more than keep pace, growing at 3.3% p.a. vs. demand growth of 2.6%. However, it may be interesting to note that in 2004, total demand for market pulp grew 5.3% worldwide, which was the 3rd consecutive year in which growth has been above the long-term trend of 2-4%. As long as economic growth remains positive and healthy globally, this should be sustainable.

Expected Global Market Pulp Supply

Thousand tonnes per year	Locale	Capacity Change					Total change 2003-2008	
		2003	2004	2005	2006	2007		2008
Bleached Softwood Kraft Pulp								
Mercer	Stendal		+30	+260	+260			+550
Ilim Pilp	Bratsk & Ust-Ilimsk			+50	+230			+280
Heinzel	Pols	+15	+15					+30
Arauco	Valdivia & Itata		+185	+130		+200	+100	+615
CMPC	Pacifico	+60	+40					+100
Sweden/Finland	Botnia & UPM mills	+120	+75	+45				+240
Others			+166	-40	-35			+91
Total BSKP		+195	+511	+445	+455	+200	+100	+1,906
Bleached Hardwood Kraft Pulp								
Eucalyptus		+870	+805	+510	+945	+1,250	+580	+4,960
Veracel	Brazil			+200	+700			+900
Aracruz	Guaiba & Barra do Riacho	+390	+90	+20	+165			+665
VCP	Brazil	+400	+90					+490
Bahia Sul	Mucuri		+120			+700	+250	+1,070
Other Brazil	Lwarcel, Cenibra	+115	+150	+40	+80			+385
CMPC	Santa Fe				+100	+450	+230	+780
Arauco	Valdivia & Itata		+310	+125	+50	+250	+100	+835
ENCE	Huelva, Pontevedra & Nacia	+60						+60
Portugal	Celbi (StoraE) & Portucel	-60	+5		-150	-150		-355
Advance Agro	Tha Toom		+30	+10				+40
Mondi	Richards Bay	-35	+10	+115				+90
Other hardwood & BCTMP		+665	+449	+920	+625	+230	+460	+3,349
Indonesia	Kiani, APRIL, PT Tel	+420	+440	+210	-100	-150		+820
United Fiber System	Kalimantan					+80	+300	+380
APP China	Hainan, China			+600	+400	+200		+1,200
Other BHKP		+245	-71	+35				+209
Larvik Cell BCTMP	Estonia			+30	+135			+165
Brancoel BCTMP	Brazil					+100	+160	+260
Other BCTMP	Canda & Nordic		+80	+45	+190			+315
Total BHKP/BCTMP		+1,535	+1,254	+1,430	+1,570	+1,480	+1,040	+8,309
Total hardwood and softwood		+1,730	+1,765	+1,875	+2,025	+1,680	+1,140	+10,215

Source: 'Defining the China Market for pulp, paper and board' Hawkins Wright

- Most capacity supply is expected to come from Bleached Hardwood Kraft Pulp (BHKP). The bulk of new capacity would come from Latin America and the Asia-Pacific. Of the estimated 10m tonnes of market pulp capacity expected to be added over the next few years, c. 20% will be in the form of BSKP (Bleached Softwood Kraft Pulp), with the rest mainly BHKP. There are two key reasons why most of the projected supply is expected to come from BHKP – supply and cost. We discuss this on the next page.

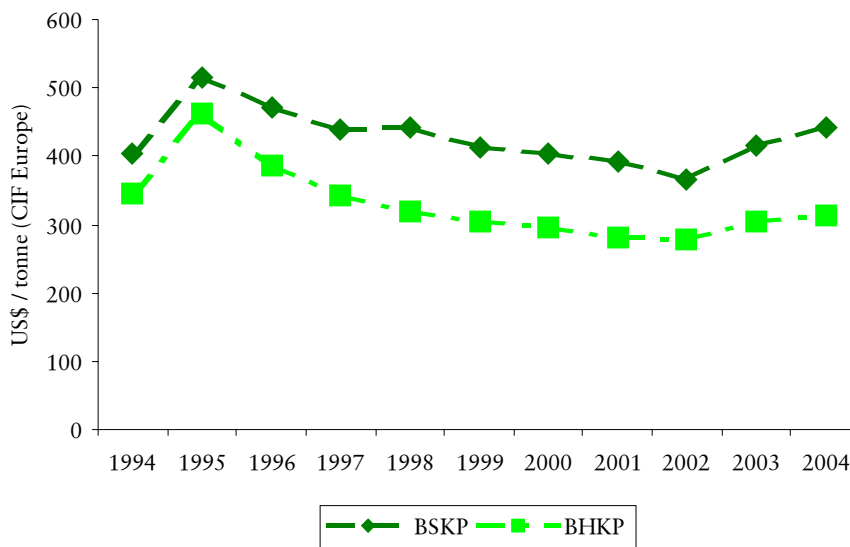
Global Forest Stock

Total cbm (billions)	Softwood	HardWood	Total
Canada	22.6	6.8	29.4
USA	12.7	9.5	22.2
Latin America	2.0	107.4	109.4
Europe	13.0	7.5	20.5
Africa	0.5	55.1	55.6
Russia	63.7	16.9	80.6
China	4.9	4.9	9.8
Japan	1.8	1.1	2.9
Southeast Asia	3.8	37.1	40.9
Australia	0.9	7.9	8.8
Sub-Total	125.9	254.2	
Grand Total	380.1		

Source: Jaakko Poyry

- **Global stock of hardwood is double that of softwood.** The worldwide stock of softwood is mostly concentrated in North America and Russia, whilst hardwood is mostly available in Latin America, Africa and Southeast Asia. Global hardwood stock is estimated at over 254bn cubic meters (cbm), more than double that of global softwood stock (126bn cbm). Thus the supply of hardwood is higher than softwood.

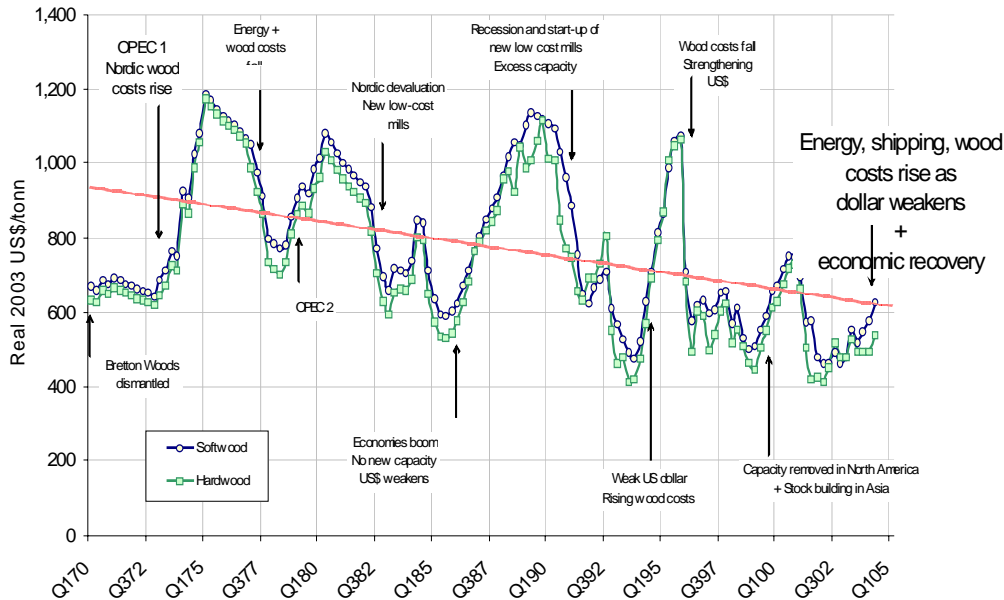
Weighted Average Cost of Production for BSKP and BHKP



Source: 'Defining the China Market for pulp, paper and board' Hawkins Wright

- **BHKP has lower production costs than BSKP.** Historically, BHKP has been much cheaper to produce than BSKP. The difference in production costs ranged from US\$89 per tonne to US\$130 over the last 8 years. BHKP prices have traditionally traded at a slight discount to BSKP prices, at US\$50 or less per tonne. This makes it attractive for prospective producers to invest in BHKP mills.
- **Pulp prices are on a long-term downward trend.** This is primarily a result of larger, more efficient and technically advanced mills being built, thereby lowering costs. At the same time, with most of the investments being in low cost regions such as Latin America and Southeast Asia, on Fast-Growing, High Yield plantations such as eucalyptus and/or acacia, costs of production are also falling.

Historical Pulp Price



Source: 'Defining the China Market for pulp, paper and board' Hawkins Wright

- **Low-cost suppliers could displace existing producers.** A key trend on the supply side is that producers from low-cost regions like Brazil and Indonesia could displace higher cost producers from North America and Europe. This is especially so given that supply is expected to exceed demand over the next few years. The closing down of some capacity should then help to tighten supply.
- **Robust historical demand for paper products in China.** From 1990 to 2003, China's demand for paper products grew at a rapid 9.6% CAGR. Consumption of these products more than tripled from 14.6m tonnes in 1990 to 53m tonnes in 2005. Meanwhile, domestic supply growth has also kept pace, growing at a 9.2% CAGR from 1990 to 2003.

Historical & Forecasted growth in China's Demand and Supply for Paper and Paperboard

('000 Tonnes)	1990	2003	2005	2010	1990-2003 CAGR	2005-2010 CAGR
Demand	14634	48056	52923	68528	9.6%	5.3%
Newsprint	526	2410	2688	3928	12.4%	7.9%
Printing & Writing	3313	10311	12353	17161	9.1%	6.8%
Tissue/Household	647	3276	3845	5647	13.3%	8.0%
Containerboard	3193	15974	18598	25920	13.2%	6.9%
Boxboard	1118	6698	7474	10825	14.8%	7.7%
Other paper & board	5837	9387	7965	5047	3.7%	-8.7%
Production	13719	43000	48116	62470	9.2%	5.4%
Newsprint	509	2070	2423	3423	11.4%	7.2%
Printing & Writing	3270	9600	10981	15603	8.6%	7.3%
Tissue/Household	679	3470	3945	5681	13.4%	7.6%
Containerboard	2627	13500	16676	23874	13.4%	7.4%
Boxboard	874	5500	6526	9292	15.2%	7.3%
Other paper & board	5760	8860	7565	4597	3.4%	-9.5%
Net Imports	915	5056	4807	6058	14.1%	4.7%
Newsprint	17	340	265	505	25.9%	13.8%
Printing & Writing	43	711	1372	1557	24.1%	2.6%
Tissue/Household	-32	-194	-100	-34	14.9%	-19.4%
Containerboard	566	2474	1922	2047	12.0%	1.3%
Boxboard	244	1198	948	1533	13.0%	10.1%
Other paper & board	77	527	400	450	15.9%	2.4%

Source: 'China's pulp and paper sector: an analysis of supply-demand and medium term projections' Center for International Forestry Research (CIFOR) and Forest Trends; Authors: Dr. Dequan He and Christopher Barr

- **Overall growth expected to decelerate but remain healthy at >5%.** With the exception of other paper & boards, all other segments are forecast to grow 7-8%. Notably, supply is expected to skew towards domestic production, away from imports.
- **Wood pulp demand has grown faster than demand for paper products.** With a limited supply of non-wood pulp as well as the government advocacy for less pollutive pulp sources, consumption of wood pulp has outpaced overall paper demand, at 13.2% CAGR over 1990-2003 compared with 9.6% CAGR for paper demand over the same period. Notably as well, demand for BHKP grew at a staggering 21.4% CAGR from 1990 to 2003.

Historical & Forecasted growth in China's Demand and Supply for Pulp

('000 Tonnes)	1990	2003	2005	2010	1990-2003 CAGR	2005-2010 CAGR
Demand	12822	40166	44853	59632	9.2%	5.9%
Non-wood Pulp	6799	11741	11441	9881	4.3%	-2.9%
Recovered Paper	4172	19199	22869	34646	12.5%	8.7%
Paper grade wood pulp	1851	9226	10543	15105	13.2%	7.5%
BHKP	235	2919	3523	6134	21.4%	11.7%
BSKP	510	2822	3231	4301	14.1%	5.9%
UKP	486	1589	1799	2229	9.5%	4.4%
MEC	451	1696	1836	2331	10.7%	4.9%
Other	169	200	155	110	1.3%	-6.6%
Production	12084	25036	26970	34453	5.8%	5.0%
Non-wood Pulp	6796	11700	11380	9845	4.3%	-2.9%
Recovered Paper	3750	9818	11482	17777	7.7%	9.1%
Paper grade wood pulp	1538	3518	4108	6831	6.6%	10.7%
BHKP	210	610	1010	3185	8.5%	25.8%
BSKP	300	860	945	3190	8.4%	27.5%
UKP	450	930	1025	1238	5.7%	3.8%
MEC	445	973	1018	1153	6.2%	2.5%
Other	133	145	110	65	0.7%	-10.0%
Net Imports	739	15148	17897	25193	26.2%	7.1%
Non-wood Pulp	3	41	61	36	22.3%	-10.0%
Recovered Paper	422	9381	11387	16869	26.9%	8.2%
Paper grade wood pulp	314	5726	6449	8288	25.0%	5.1%
BHKP	25	2309	2513	2949	41.6%	3.3%
BSKP	210	1962	2286	3111	18.8%	6.4%
UKP	36	659	774	991	25.1%	5.1%
MEC	6	723	818	1178	44.6%	7.6%
Other	36	73	59	59	5.6%	0.0%

Source: 'China's pulp and paper sector: an analysis of supply-demand and medium term projections' Center for International Forestry Research (CIFOR) and Forest Trends; Authors: Dr. Dequan He and Christopher Barr

- **Strong demand forecasted for BHKP.** China's demand for BHKP is forecast to grow at CAGR of 11.7% from 2005-2010, up from 2.9m tonnes in 2005 to over 6.1m tonnes in 2010. However, it is interesting to note that CIFOR has forecasted that most of this demand would be met by domestic production, with a tripling of production from 1m tonnes in 2005 to over 3.1m tonnes in 2010. Meanwhile, imports of BHKP are expected to grow by only 0.5m tonnes over the same period.

- **Authors of this research project domestic pulp production to triple from 2005 to 2010.** This would slow down pulp import growth. Other sources we have checked with opined that the projected ramp-up in domestic production of BHKP may be over-optimistic and we have tried contacting the authors to discuss their assumptions but were unable to get hold of them prior to writing this report. We should have more updates on this issue if discussion with the authors changes our view significantly. Reasons why China will likely continue to be heavily reliant on pulp imports are discussed on the next page.

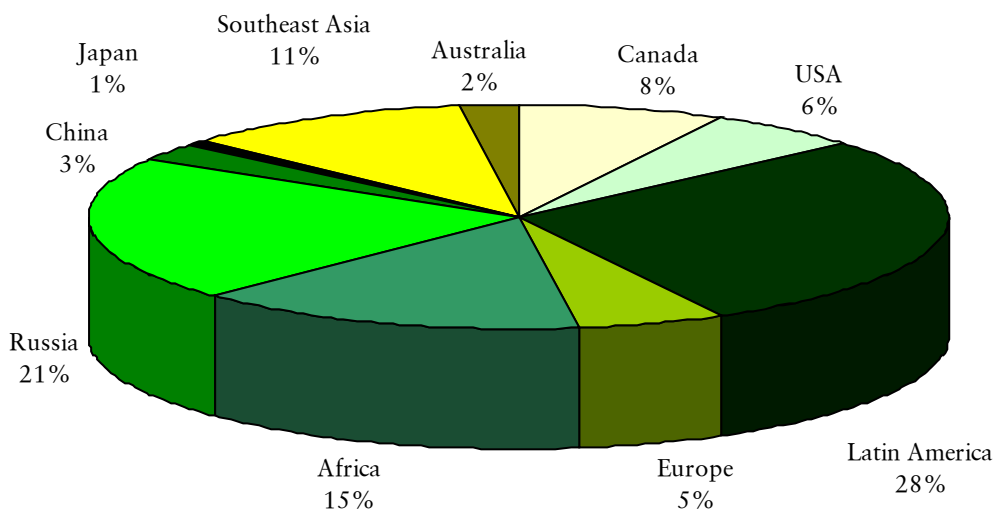
- **Historically, China has been heavily dependent on imports to meet its pulp demand growth.** With the ban on logging in natural forests and relatively little pulpwood (e.g. acacia, eucalyptus, poplar and pine) plantations, China relies heavily on imports to meet its wood fiber demand. The lack of wood fiber resources is also exacerbated by the fact that non-wood residue resources are also

limited. The government is also advocating a shift away from using non-wood residues such as straw, as it is highly pollutive, and this has also increased demand for wood-fiber resources.

- **China should continue to be heavily reliant on pulp imports in the medium term.** Two reasons for this – (i) lack of wood fiber domestically, and (ii) cheap and easy availability of pulp from Latin America and Indonesia.

- **Lack of wood fiber domestically.** China’s demand for market pulp in 2003 accounted for 12.9% of global demand, and is expected to rise to 17.3% by 2008. In contrast, China’s stock of both hardwood and softwood represents only 3% of the global total. Moreover, the ban on logging in natural forests means that much of the remaining wood stocks cannot be tapped. Even if China embarks on a massive planting program, it will take at least 5-7 years for it to establish sustainable plantations.

Global Wood Stocks – 380bn cbm

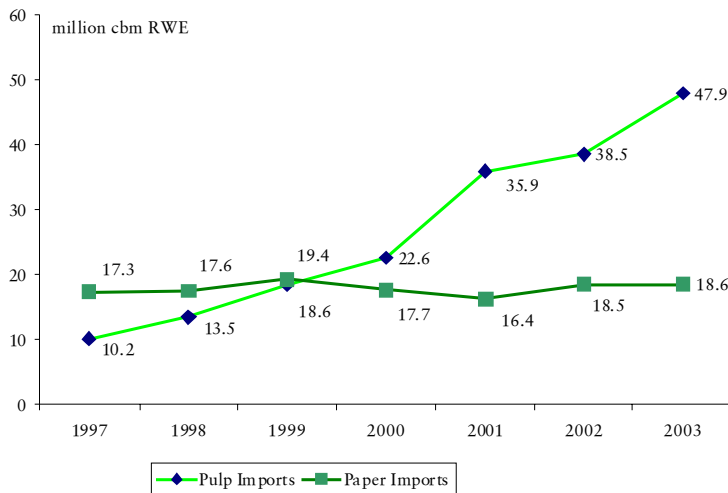


Source: Jaakko Poyry

- **Challenges in establishing plantations in China.** In a presentation prepared by Cossalter for the International Forum on investment and finance in China’s forestry sector in Beijing, 2004, he noted that the development of fast-growing plantations in southern China faced many challenges. These include the scarcity of land, which competes with other cash crops grown in China, as well as limited genetic diversity, which may sharply constrain productivity and yield for some time.

- **Lack of wood fiber resources is also evidenced by China’s flat paper import growth along with rising pulp imports.** While pulp imports more than quadrupled from 1997 to 2003, paper imports barely grew from 17.3m m³ RWE in 1997 to 18.6m m³ RWE in 2003. This is consistent with the fact that China’s wood-based paper manufacturing capacity has increased over the last few years, but it also highlights that the supply of China’s wood fiber resources has a lot of catching up to do.

China's Paper & Pulp Imports in million cubic metres Round Wood Equivalents (RWE)



Source: Forest Trends, Center for International Forest Research, and Chinese Center for Agricultural Policy

- **Cheap and easy availability of pulp from Latin America and Indonesia.** Given the higher costs of imported wood, China's pulp production costs are likely to be higher than low cost producers such as Brazil and Indonesia. As such, we believe there is a strong possibility that China's paper and paperboard producers are likely to continue to source a substantial amount of pulp from overseas.

Global BHKP Production Costs

	Brazil	Indonesia	US South	Portugal	Canada East	Finland	Spain	Average
Wood	71	102	128	188	158	243	219	132
Chemicals	28	17	37	59	30	38	41	33
Energy	10	14	23	6	24	2	11	14
Variable Costs	109	134	188	253	211	283	270	179
Labour	8	13	40	49	50	41	49	30
Maintenance	12	13	31	22	23	16	19	18
Other Mill Costs	24	25	50	37	35	19	36	31
Fixed Costs	44	52	122	107	108	77	104	79
FOB Mill	153	185	310	360	319	360	374	258
Ocean Freight	44	37	53	18	73	38	26	43
Marketing and Sales	17	12	10	5	7	8	15	12
CIF	214	234	373	383	399	406	415	313

Source: 'Defining the China Market for pulp, paper and board' Hawkins Wright

Action

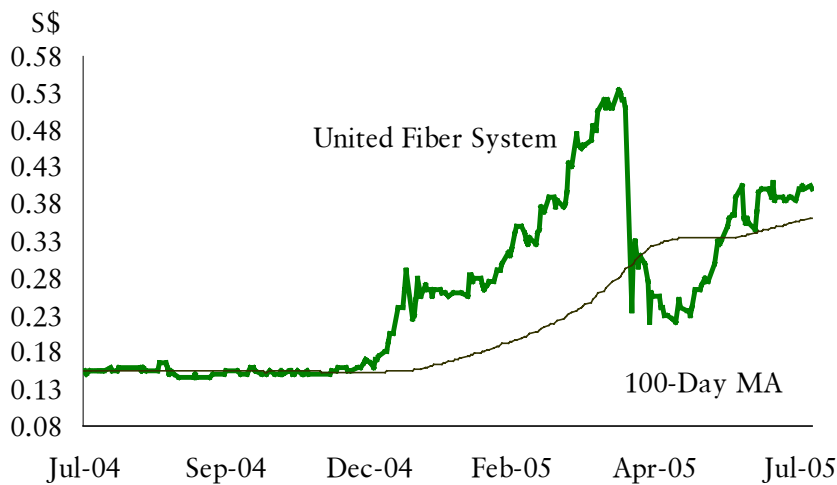
• **BUY – United Fiber System (UFS).** UFS has plans for a 600,000 tonne p.a. BHKP pulp mill to be built by end FY07, and has a 258,000 ha forest concession to supply plantation wood to this mill. The Group also recently announced an agreement to buy over the Kiani Kertas mill in Indonesia, with 550,000 tonnes p.a. of pulp production capacity. The combined 1.15m tonne p.a. capacity would make them the 3rd largest pulp producer in Indonesia after APP and APRIL. Whilst we are waiting for more details of the Kiani Kertas deal to come forth and for it to be completed, we have a target price of S\$0.55 for UFS. This does not impute any potential value accretion from the Kiani Kertas mill.

Previous DBSV Reports on UFS

Date	Type	Title	R'cmd	Closing Price	Target Price
23 Aug '04	Initiation	Growing its forestry and pulp business	BUY	S\$0.165	S\$0.265
16 Dec '04	Update	Positive Developments	BUY	S\$0.195	S\$0.27
25 Jan '05	Update	More visibility on Pulp Mill Project	BUY	S\$0.255	S\$0.395
17 Mar '05	Update	Forest concession dispute close to settlement	BUY	S\$0.395	S\$0.545

Source: DBS Vickers

12-Month Share Price Chart for UFS



Source: DBS Vickers

• **BUY – Guangzhao Industrial Forest Biotechnology Group (GIFB).** GIFB is engaged in the research & development, and cultivation of its Guangzhao Fast Growing Poplar. We like GIFB as a unique long-term play on the growing demand for paper in China and the lack of wood fiber domestically. It is well poised to tap on this demand with its fast-growing poplar. GIFB is expected to begin cultivation of its salt-tolerant poplar this year, which should lower costs substantially whilst addressing the issue of land scarcity in China due to competition with cash crops. We have a target price of S\$0.365 for GIFB, which is based on a 30% discount to our DCF value of S\$0.525 (WACC of 10.4%).

Previous DBSV Reports on GIFB

Date	Type	Title	R'cmd	Closing Price	Target Price
24 Sep04	Initiation	To see things is the seed, it is genius	BUY	S\$0.265	S\$0.41
16 Nov04	Results	Planting for growth	BUY	S\$0.31	S\$0.41
8 Apr05	Results	Still an attractive long-term growth story	BUY	S\$0.25	S\$0.365

Source: DBS Vickers

12-Month Share Price Chart for GIFB



Source: DBS Vickers

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