

**MOBILE TELEPHONY: FOR HOW LONG A  
LICENCE TO PRINT MONEY**

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## Mobile telephony: for how long a licence to print money?

Our speaker will be looking at markets across Asia, so our background paper focuses on two markets he will not be examining in detail, Hong Kong and China.

### Hong Kong

#### *Public Mobile Radio Service licenses (PMRS)*

Hong Kong currently has four mobile operators: Hutchison Telephone, SmarTone Communications Ltd, Hongkong Telecom CSL Ltd and Pacific Link who operate seven different networks between them. As it is the time for digital networks, most of the analogue customers have been migrated to digital networks. Currently, these four PMRS operators are using the following digital networks:

<i>Operator</i>	<i>Standard</i>
HKT	GSM
Hutchison	GSM, CDMA
Pacific Link	TDMA
SmarTone	GSM

As of March 1996, Hong Kong had 717,400 digital mobile subscribers and 69,700 analogue subscribers—a huge jump from 12 months earlier when the numbers were 274,400 and 213,200 respectively. The biggest single reason for this growth is the price war now fully under way in Hong Kong as Hutchison and SmarTone have just slashed prices on their GSM (Global System for Mobile) network handsets and Hutchison has rolled out its new CDMA (Code Division Multiple Access) digital network with a low unlimited calling plan. Pacific Link quickly followed suit.

The slashing of handset prices and the introduction of Hutchison's CDMA network, however, only represent the start of a price war. Even though Hutchison is undercutting HKT by 63% on the price of its Ericsson phone, it is still making a 15% profit margin on the handsets. This price war will almost certainly bring down GSM handsets to below cost, meaning under HK\$2,000, by the end of the year. Similarly, tariffs will come down—prices in Hong Kong are currently twice what US cellular operators charge per minute. The affects on the various players are likely to be as follows:

#### *Hongkong Telecom*

Hongkong Telecom has a customer base that currently pays high charges. Its problem is that it does not have the spare capacity to add new subscribers. Its network is 70% full and the company is not likely to win a PCS licence.

#### *Hutchison Telephone*

Hutchison will lose some revenue as its current "high-spend" customer base starts to pay lower charges. However, the company has enough spare capacity to flood the market with low-cost phones and earn a stable 20% bottom-line growth for its telecom division.

#### *Pacific Link*

Pacific Link already offers low handset and per minute prices, thus it is very well positioned for a price war. Pacific Link has room to cut prices and still enjoy double-digit growth in the bottom-line over the next few years. Pacific Link was the first to lower handset charges in the middle of 1995. This is part of the reason why First Pacific recorded 162% subscriber growth last year. Pacific Link's strategy was simple: the company knew it would not make money on handsets in the future, thus, it was content just not to lose money. Since per minute plans are still very high in Hong Kong, Pacific Link can afford to subsidise its handsets. All of the cellular players wanted to put this off as long as possible.

Although Pacific Link lowered its rates last year, the rest of the market really did not have to respond. This is because Pacific Link's digital network is based on the US standard D-Amps, as opposed to SmarTone, Hutchison and HKT, who all use the GSM standard. The truth is, they are just different standards but voice quality is nearly the same and the networks and functionality of the phones are comparable. The real difference depends upon the scope of network coverage and the number of cell-sites within a given coverage area, and these are variables.

#### *Personal Communications Service (PCS)*

Hong Kong's telecoms regulator, the Office of Telecommunications Authority (OFTA), planned to award up to six PCS licences August, 1995. The regulator has made it quite clear it wants to flood the cellular market with capacity by issuing six (or four subject to the Joint Liaison Group's final decision) PCS licences. The existing cellular operators know that the PCS applications approved by OFTA have a per minute charge of around HK\$0.7. If PCS operators are subject to this tariff schedule, then the only way for them to turn a profit would be to start a price war and try to grab a huge swathe—tens of thousands if possible—of subscribers when the new PCS licences are issued. (It was largely due to the delay of issuing the six new PCS licences, and the threat they posed, that Hong Kong's cellular price war broke out early this year.)

#### *CT2*

Although now destined to be nothing more than a footnote in telecoms history, CT2 is worth a mention. It was designed as a low-cost solution to accommodate the mobile telephone needs of pedestrians. However, the thousands of base stations needed presented a significant hurdle cost. CT2 has only been introduced sparingly around the world, and only in Hong Kong has the platform been profitable—with three operators offering services. The original CT2 architecture only allowed for calling out. An upgrade to the system can now allow for two-way calling but only Hutchison has done this upgrade. Because of Hong Kong's cellular price war, all three CT2 operators announced they would be closing down their CT2 divisions by the end of this year. Some of them will upgrade their customers to their own cellular networks with competitive prices while the others help their customers migrate to other cellular networks.

#### *Cordless Access Service (CAS)*

CAS, defined as "low mobility, cordless services which primarily provide public services for access to fixed telecommunications networks", is viewed as the next generation of CT-2 technology. The distinction between licences granted for PCS and CAS services is that the latter will enable operators to have carrier like status or carrier like rights. There are three forms of CAS available:

- \* Personal Handy Phone System (PHS)
- \* Digital European Cordless Telecommunications (DECT)
- \* Personal Access Communications System (PAC)

Hong Kong's OFTA announced the award of up to four CAS licences by the end of 1995 in order to kick-in competition and improve the range and quality of services in Hong Kong's telecom markets. However, the licences have not yet been issued due to China's reluctance to give its assent. In February this year Chinese appointees to the Joint Liaison Group, the body responsible for handling issues concerning the return of Hong Kong to China in 1997, said British officials had failed to provide enough information for them to make a decision. It is believed one of the Chinese side's stumbling blocks is what it perceives as OFTA's preference for DCS 1800 PCN technology rather than CDMA technology.

Six consortium in Hong Kong bid for CAS licences:

- \* SmarTone Communications Limited
- \* Chevalier
- \* Champion Technology
- \* New World Telephone
- \* Hongkong Telecom
- \* Hutchison Telephone

Hongkong Telecom and Hutchison Telephone will use PHS technology, while the other four will use DECT technology.

#### COMPARISON BETWEEN PHS AND DECT

	PHS	DECT
Dedicated control channel	Required	Associated in traffic channel
Cell radius	150m	100m
Mobility	20km/hr	10 km/hr
Multi-vendor		
- Handset	Yes	Yes
- Base station	Yes	No
Multiple Applications	Public, office, and home cordless	Public, office, and home cordless
High speed data	32 kbps	Nx 32 kbps
Integration with cellular	Technical feasible	Likely with GSM/DCS-1800

#### *Prospects*

The final emergence of long overdue competition in Hong Kong's cellular market has been good for consumers. It should remain this way, provided OFTA retains some of its freedom to push competitive solutions post-1997. The hold-up in the issuing of PCN licences has already raised questions marks over the business plan assumptions contained in the original bids, although OFTA points out that the projections of market demand growth rates during the bidding process period have already been exceeded, mostly for

the reasons outlined above. In the future planning of spectrum allocation three things will need to be taken into account:

1. the convergence of fixed-wireline and wireless services
2. the rapid advance of technologies, including wireless satellite technologies which cross-borders.
3. the broadening of the market

Spectrum will remain forever a scarce resource requiring allocation decisions based upon some view of the public interest - although see point 2 above - and it will therefore remain essential that the status of OFTA as a neutral, independent regulator and policy advisor is not compromised.

## China

China's cellular phone subscribers, 1987-2000

	Subscribers	Net increase	Annual growth
	'000	'000	%
1987	1	-	-
1988	3	2	329
1989	7	4	133
1990	20	13	186
1991	48	28	140
1992	177	129	269
1993	638	461	260
1994	1,570	932	146
1995	3,500	1,930	123
1996	6,000	2,500	71
1997	8,700	2,700	45
1998	11,745	3,045	35
1999	15,268	3,523	30
2000	26,143	4,580	30

Source: CTC News

China's mobile phone market has grown stunningly fast. The Ministry of Posts and Telecommunications (MPT) originally announced a target of eight million subscribers by 2000. It now expects to reach this target by the end of 1997—and have three times as many as this by the end of 2000. This will push wireless teledensity up from about 0.02% now to 1.7%.

GSM is the area of fastest growth. The MPT had around GSM networks operating in around 15 municipalities at the end of 1995; it expects to add another 17 provinces by the end of this year.

China United Communications (Unicom), China's second network company, started four GSM networks in summer 1995, in the cities of Beijing, Tianjin, Shanghai and Guangzhou, and as of the end of 1995 had about 25,000 subscribers. Despite teething problems and strong resentment from MPT networks, it is building out or has plans to build out another

26 GSM networks. Unicom's goal is to have about three million GSM subscribers by 2000.

### *Competition*

As with Hong Kong, competition is having a major affect on China's telecoms environment. The establishment of Unicom has transformed the MPT from being a sleepy monopoly provider of fixed line services with little clout among China's many ministries to becoming increasingly fleet-footed and powerful. It has also become increasingly predatory: in the run up to the launch of Unicom's first four mobile networks it cut the prices of its handsets. The MPT interconnected GSM networks in 18 cities in 15 provinces in January 1996—less than four months after it announced that the project was going ahead. In 1995 it had established national roaming across all its Motorola and Ericsson analogue-based networks. With the Unicom networks now off the ground, both the MPT and Unicom are now stressing their respective price and service advantages.

In the longer run the returns that competition will bring to the consumer will depend to a great extent on the regulatory framework China adopts. In theory, the MPT's operations were hived off in 1994 into the Directorate General of Telecommunications (which occasionally refers to itself as China Telecom) while retaining its regulatory functions. In practice, the split has been hard to find. Clearly, under these circumstances the MPT can adopt all manner of practices, most notably cross-subsidisation, in its continuing battle with Unicom. If competition is to move ahead even relatively smoothly stronger regulation will be necessary. (Already problems are occurring with unauthorised spectrum usage: spectrums are allocated at a national level by the State Radio Regulation Commission, but policing is virtually non-existent. Another, related, problem is interference between different systems.)

Regionally, Guangdong dominates China's mobile network, with over a million subscribers, 200,000 of them in Guangzhou alone. But what is striking is how geographically dispersed the networks are—in short, almost everywhere has a network (even Tibet has a network, albeit one with a capacity of just 3,500 subscribers).

On the supply side, equipment provision is dominated by Motorola and Ericsson. At the start of 1996, Motorola systems formed the basis of some 21 provincial or municipality networks, with Ericsson systems in 15. (As with fixed line networks, foreign companies remain barred from operating and service provision, restricting their business to equipment supply and technical assistance.)

China's leading 900 MHz analogue mobile regions, end 1995

	<b>Capacity, '000</b>
Guangdong	1,126
Jiangsu	784
Zhejiang	420
Heilongjiang	350
Hunan	349
Shandong	310
Sichuan	308
Liaoning	256

Shanghai	220
Hubei	210
Guangxi	207
Fujian	189
Jilin	180
Beijing	176
Anhui	160
Henan	158
Shanxi	156
Tianjin	75
Nationwide	6,127

Source: MPT, IGI Consulting

Provincial capitals with most mobile subscribers, end 1995

City	Subscribers
Guangzhou	198,000
Shanghai	168,000
Beijing	160,000
Tianjin	76,000
Shenyang	61,000
Wuhan	57,000
Harbin	55,000
Chengdu	44,000
Hangzhou	38,000
Zhengzhou	36,000

Source: MPT

However, as GSM has emerged as China's preferred digital system to replace the Motorola and Ericsson analogue networks in place, other foreign companies have been scrambling to establish themselves, most notably Siemens, which along with Motorola has been the main supplier to the Unicom networks set up so far. Other players attempting to establish themselves are Nokia (with the MPT in Beijing), Northern Telecom, Alcatel, AT&T and NEC.

#### *Prospects*

Rapid as the MPT's prediction of growth is for China's mobile phone market up to the end of 2000, there are reasons for thinking it may be conservative. Mobile tariffs in China are exceptionally low, and with households having to pay around Rmb5,000 in Beijing for a fixed line—and having to wait for the privilege—mobile phones appear not only attractive as high-status accessories but also cheaper and easier to install than having a standard telephone.

Consequently some analysts are predicting figures far higher than the MPT. CTC News, a newsletter published in Beijing by an MPT affiliated company, argues that given falling wireless technology and installation costs Unicom could have 4.5 million subscribers by

2000—50% more than the company expects to have. It also describes the MPT's target as conservative but does not give an alternative estimate.

Alongside GSM, and its related TDMA technology, it appears that China will probably also adopt CDMA technology. The State Radio Regulatory Commission, the body charged with allocating frequencies to users, is set to decide CDMA, PCS and DCS 1800 frequencies by the end of 1996. In the meantime, Motorola is set to test wireless local loop CDMA system in Fujian (in the 1.9 GHz band)—the first time a CDMA system will be used in China. NEC has also begun testing its PHS system on a trial basis in Tianjin, though only with 200 handsets so far.

The chairman of Jitong Communications, Lu Shouqun, has suggested that while GSM will probably remain the standard for urban areas, CDMA is likely to be adopted in rural regions. According to Mr Lu, the People's Liberation Army prefers CDMA because of concerns over spectrum congestion, and the PLA is definitely a player to watch for the future.