

bda

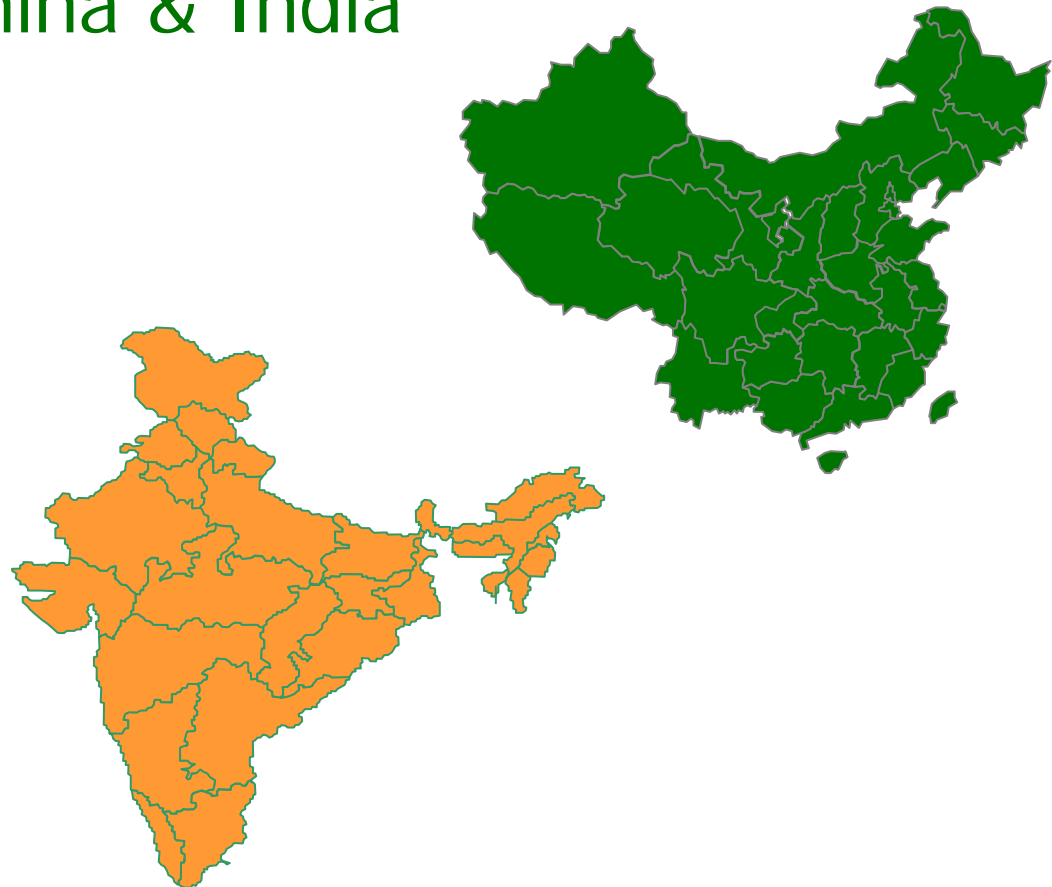


Growth Markets: China & India

IEEE ICC
Istanbul, June 14th 2006

Duncan Clark
Chairman, Managing Director

www.bdachina.com



- BDA provides research and consulting services to leading TMT firms and investors, with a focus on China and emerging markets and technologies in Asia.
- Leading TMT consultancy in China. Founded in 1994. Team of 30 based in Beijing (>22 professional staff)



- BDA has dedicated analysts organized around three sector groups:

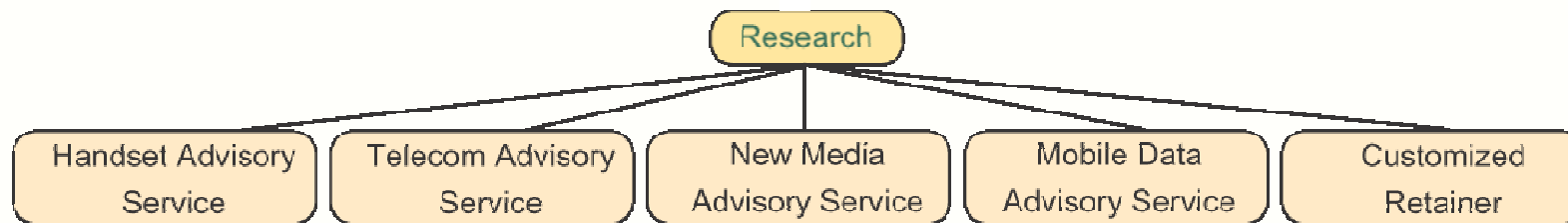
Handsets/Devices

Fixed Line & Wireless
Equipment & Services

Internet/New Media



- BDA offers the following China-focused Research Advisory Services



BDA is now active in India where we are assembling a team in New Delhi



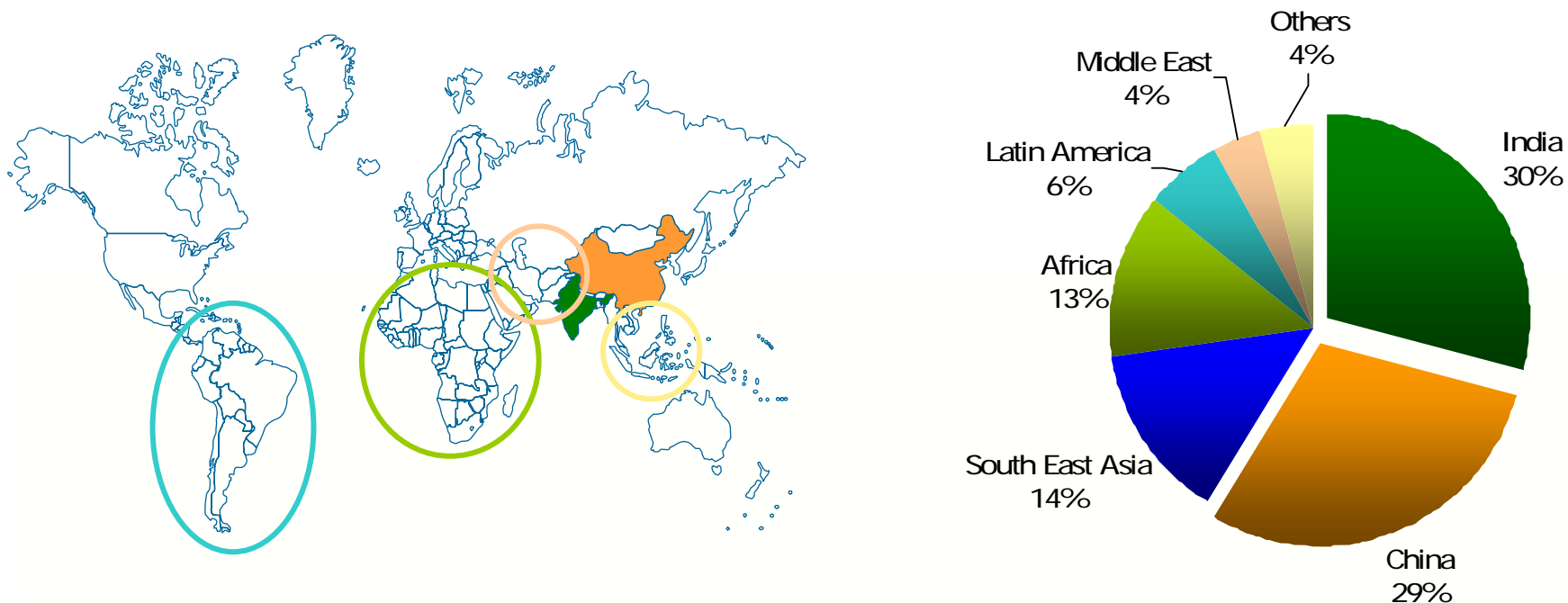
TELECOM REGULATORY
AUTHORITY OF INDIA



- BDA was hired in 2004 by the Telecoms Regulatory Authority of India (TRAI) to advise on possible relevance of China's communications sector growth to India
- BDA has researched and presented extensively on the Indian mobile market, including at 3GSM in Barcelona and has been engaged on a range of consulting projects for technology clients involving India
- BDA's India efforts are overseen by Kunal Bajaj, based in New Delhi where BDA is now assembling a team
- Kunal started his career in New York with McKinsey & Company including assignments in New Delhi involving McKinsey's knowledge services. He then headed the technology division of a USD 60 million-revenue internet marketing company in New York.
- Most recently, Kunal worked as Consultant (Projects) for the Telecom Regulatory Authority of India (TRAI), focusing on driving growth in internet and broadband penetration in India. His recommendations were published in TRAI's "Broadband India" report. Kunal has three degrees from the University of Pennsylvania, graduating with Magna Cum Laude Honors. He has a B.Sc. in Economics from the Wharton School with majors in Finance and Management, a BSE from the Engineering School with a major in Computer Science Engineering, and a MSE in Telecommunications and Networking, also from the Engineering School.

- China & India in a Global Context
- China Market Update
- India Market Update
- India: Is it China v2.0?
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India & China together represent 60% of the un-served mobile population in emerging markets



Emerging markets today

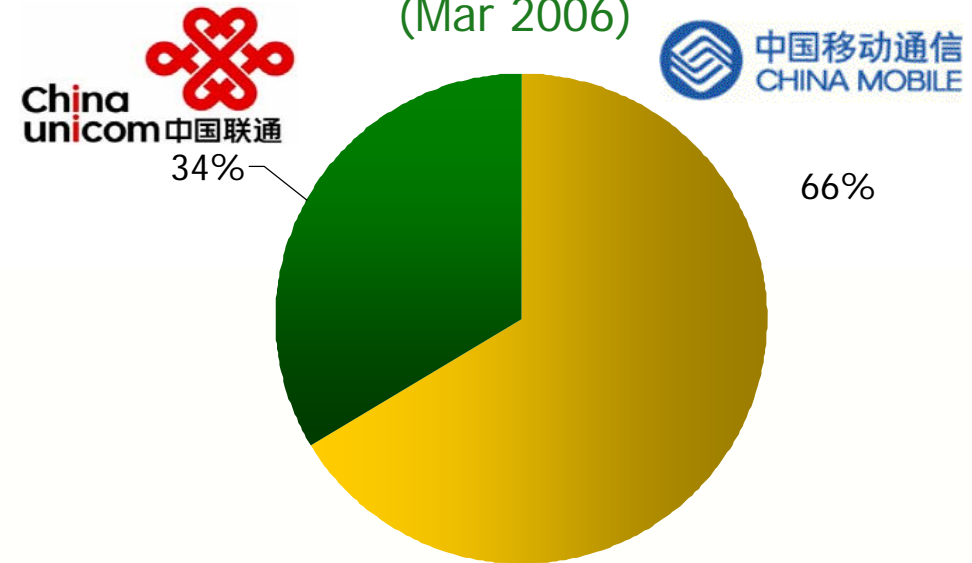
0.8 billion subs of 4.5 billion total population (18% penetration)
3.7 billion remain un-served

Emerging markets include the following countries by rank of un-served population: India, China, Indonesia, Pakistan, Bangladesh, Nigeria, Brazil, Vietnam, Ethiopia, Mexico, Egypt, Iran, Russia, Congo Democratic Rep, Philippines, Myanmar, Sudan, Tanzania, Thailand, Turkey, Ukraine, Colombia, Afghanistan, Kenya, Algeria, Nepal, Uzbekistan, Uganda, Iraq, Zimbabwe, Malaysia, Tunisia, Congo Republic

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Population	1.31 billion
Fixed Subs	359 million
Fixed Penetration	27%
Mobile Subs	410 million
Mobile penetration	30%
Internet Subs	111 million
Internet Penetration	8%

Operator Market Share Breakdown
(Mar 2006)

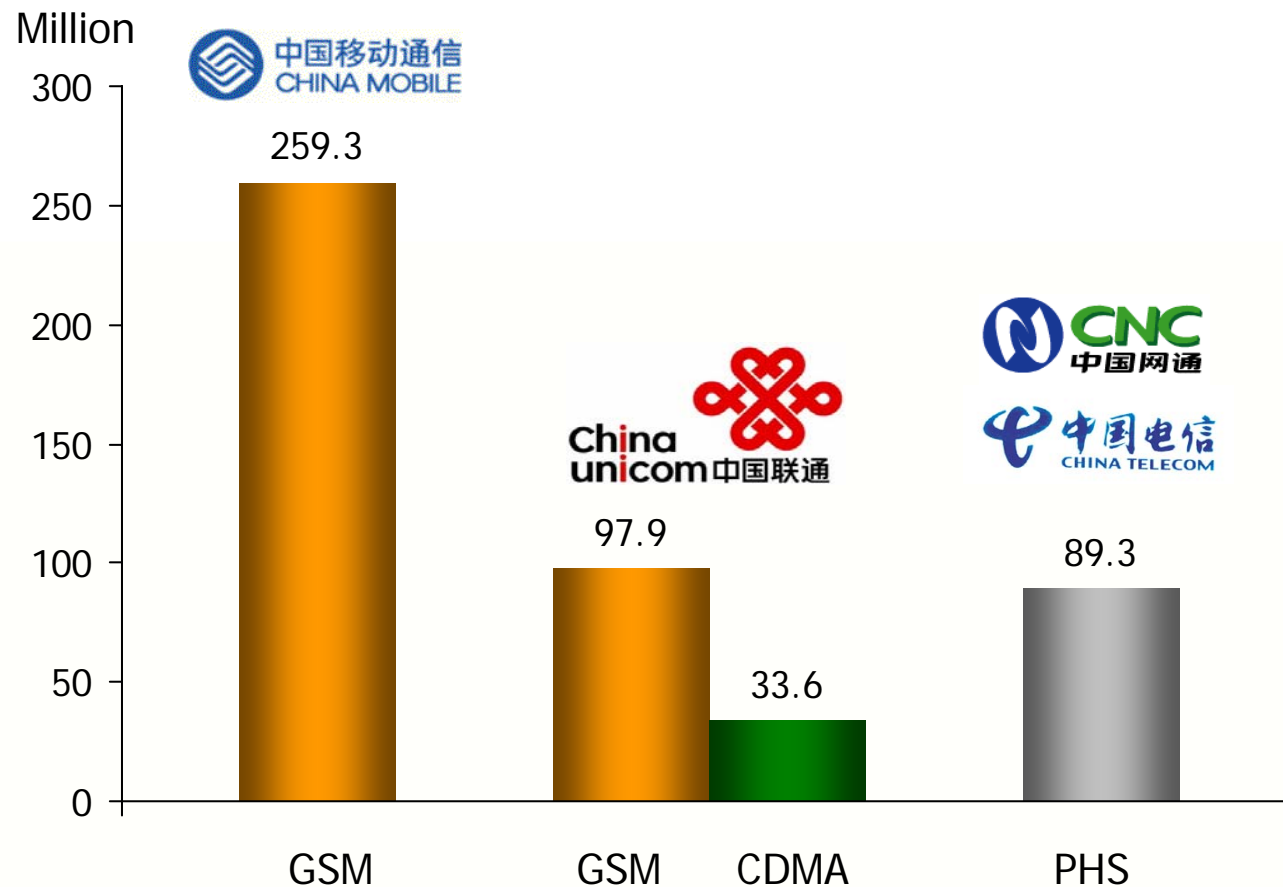


Selected market trends

- Subscriber growth remains strong at 5.4 million new subs per month
- China Mobile continued to gain share from China Unicom in 2005
- 3G licences expected 2H 2006 or 1H 2007; operators will roll out 3G services over 12 to 18 months after 3G licences are issued, but likely not nationwide.

GSM dominates the mobile market with 342 million subs,
91% of the market (74% if PHS included)

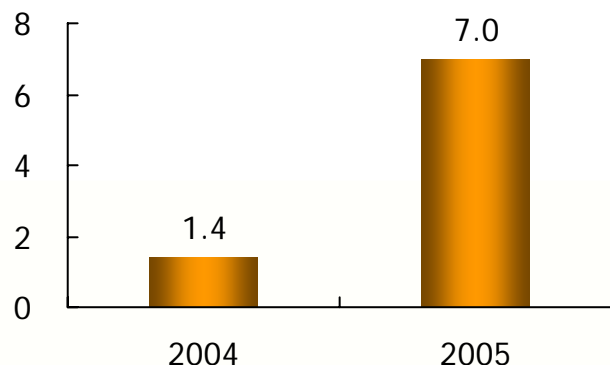
Mobile Subscriber Breakdown by Technologies (Mar 2006)



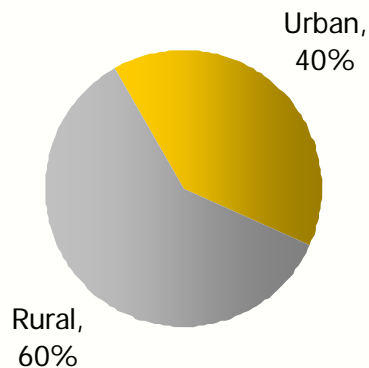


China Mobile Investments in Rural Markets

RMB Billion



Breakdown of China Mobile's Incremental Revenues in 2005



- China Mobile is one of the most aggressive operators investing in rural area to provide USO service.
 - China Mobile has invested nearly RMB 9 billion (USD 1.1 billion) in the rural telecom market since 2004, connecting over 25,000 villages
- China Mobile is making significant returns on its rural investments and considers the rural market a key growth driver
 - 60% of China Mobile's incremental revenues came from the rural market in 2005.
 - China Mobile is the only major operator making a profit from all of its provincial subsidiaries, thanks to its early rural investments.
 - In 2006, China Mobile plans to increase the penetration of phones by 1.5% in villages in the 10 provinces where it participates in USO.

ARPU has stabilized due to rapid uptake of data services, although Q1 price cuts caused a dip

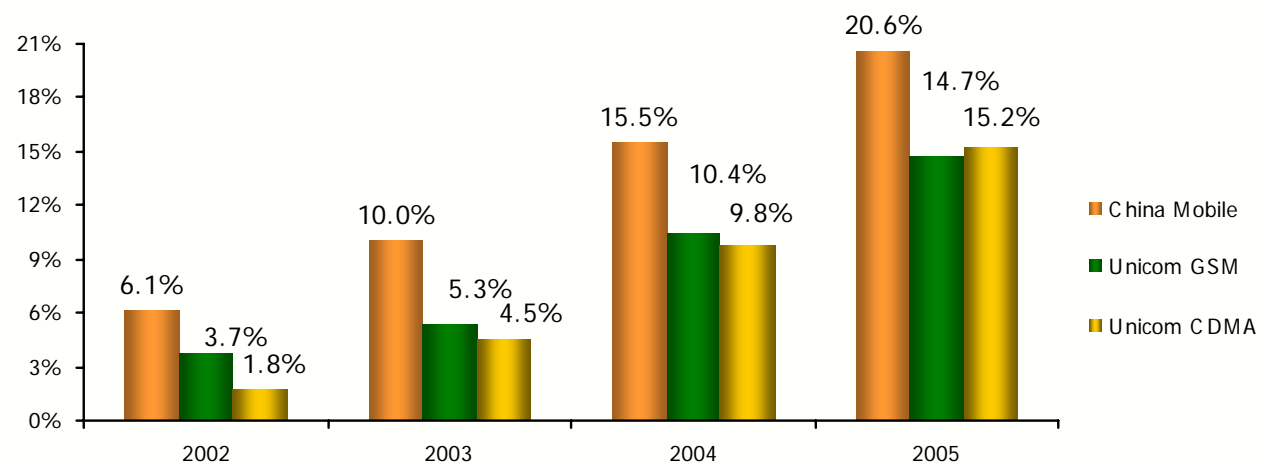
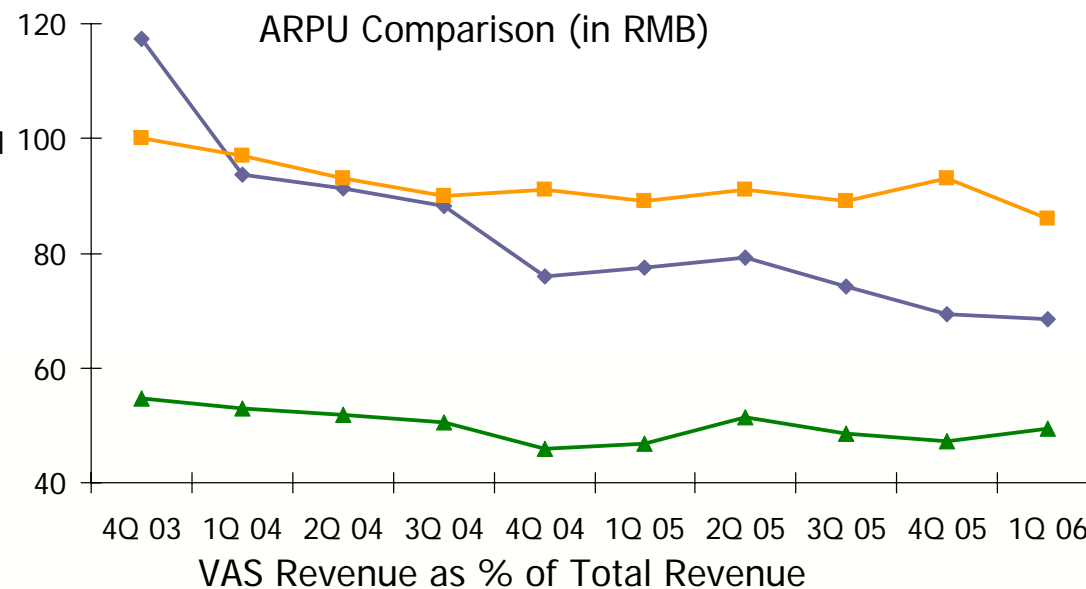


China Mobile GSM



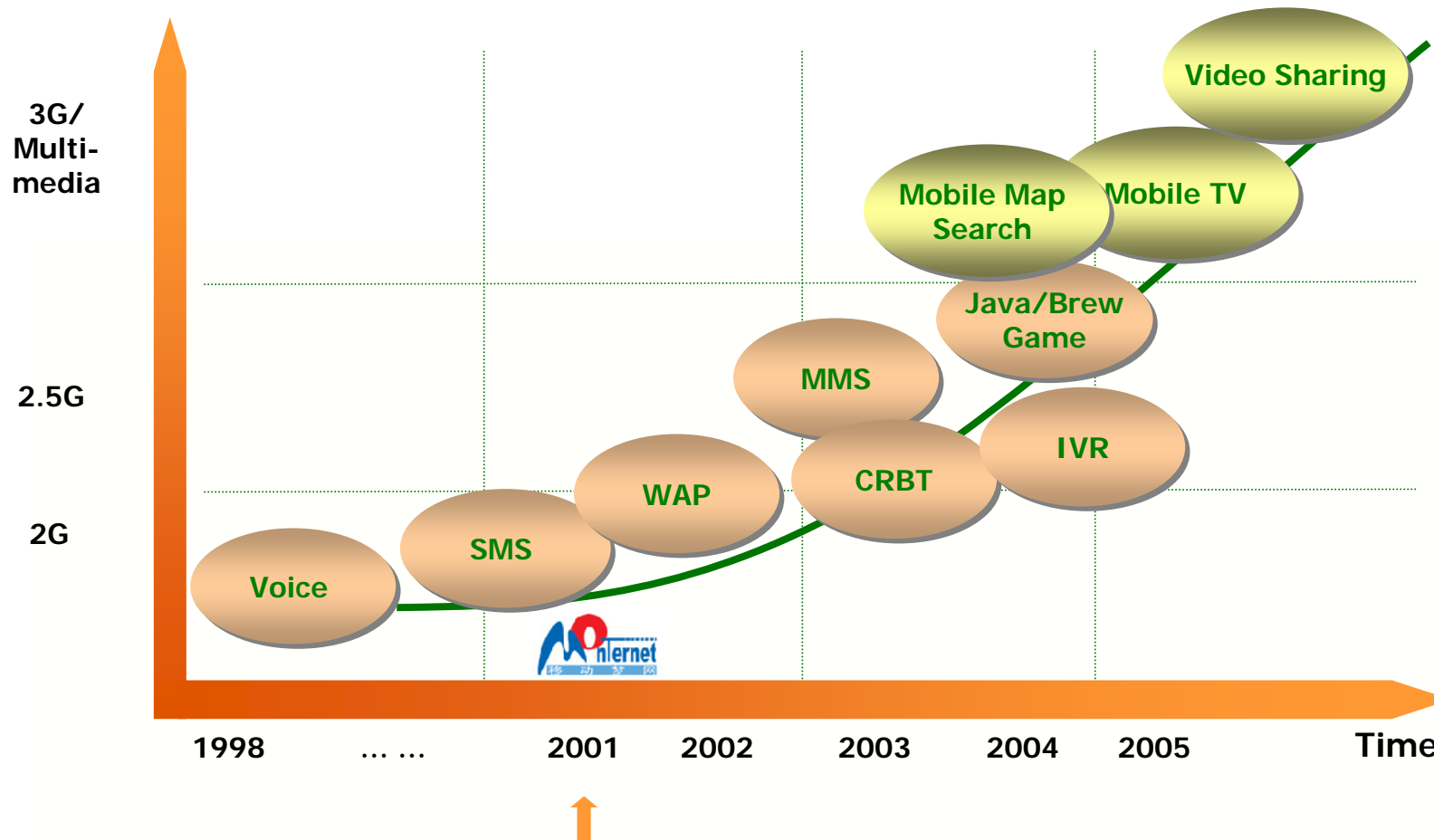
Unicom CDMA

Unicom GSM

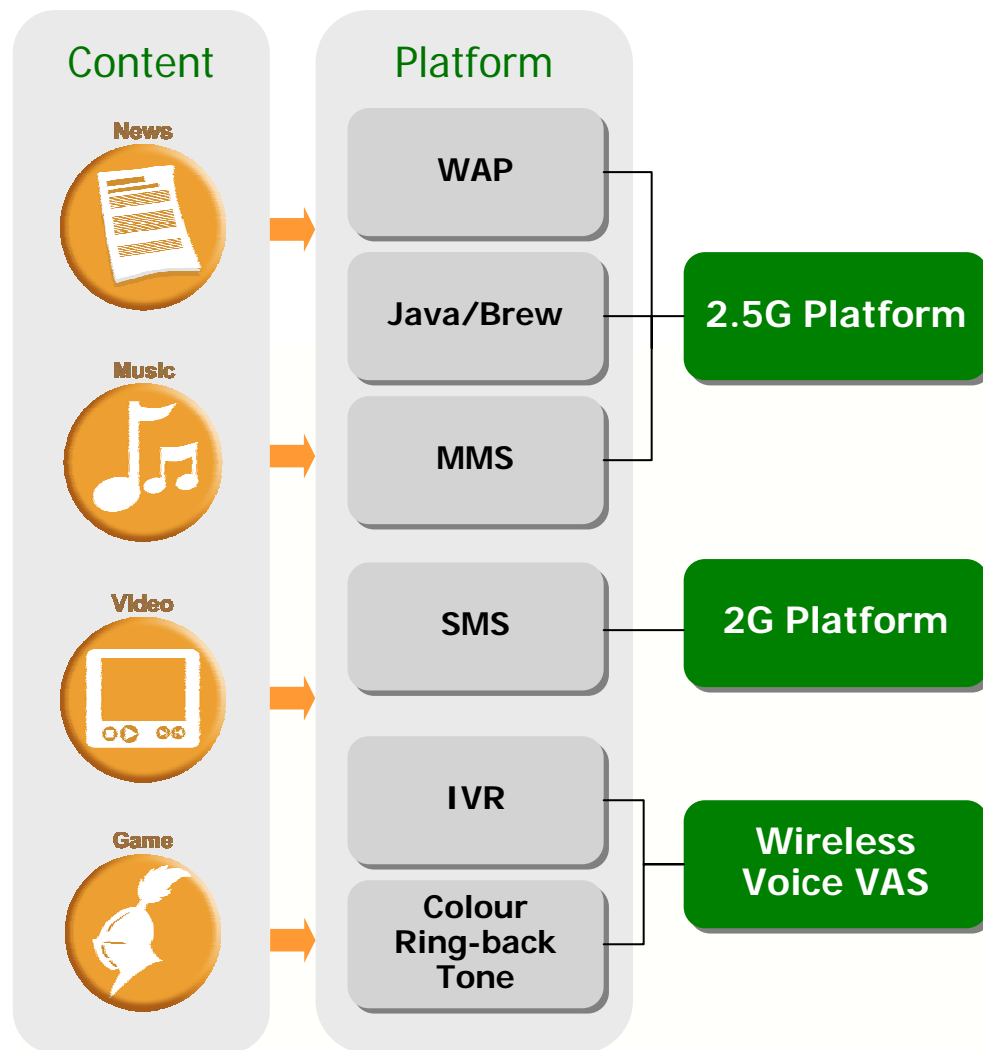


Operators are introducing increasingly sophisticated services in the run-up to 3G

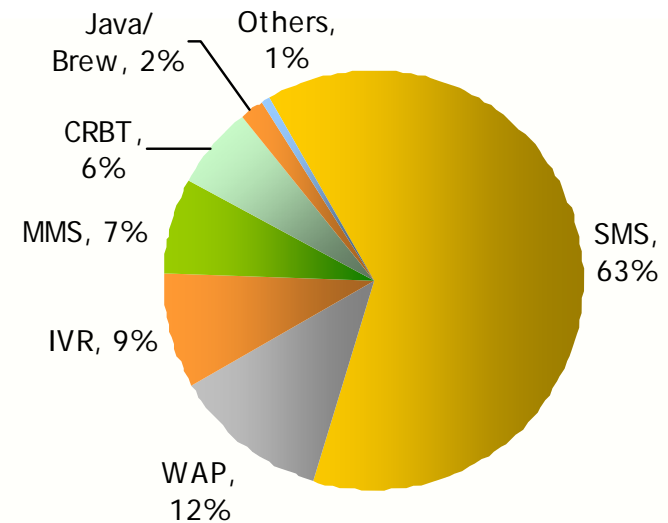
Terminal Evolution



China's mobile data market is shifting to 2.5G services like WAP & Java, but SMS remains dominant

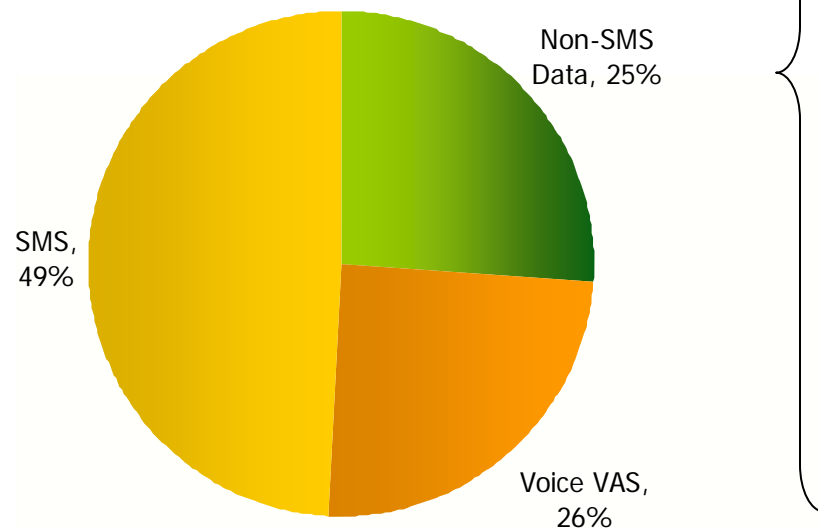


WVAS Revenue Breakdown by Application in 2005

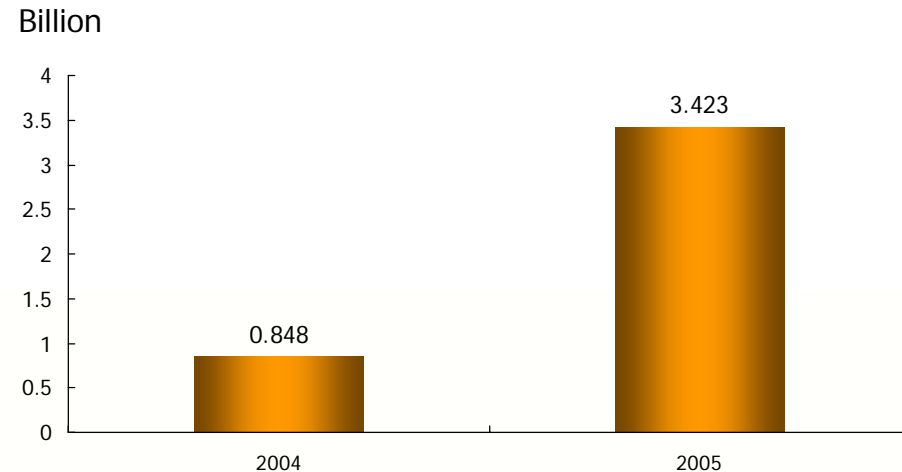


China Mobile has experienced rapid growth in Colour Ring Back Tone (CRBT) and WAP

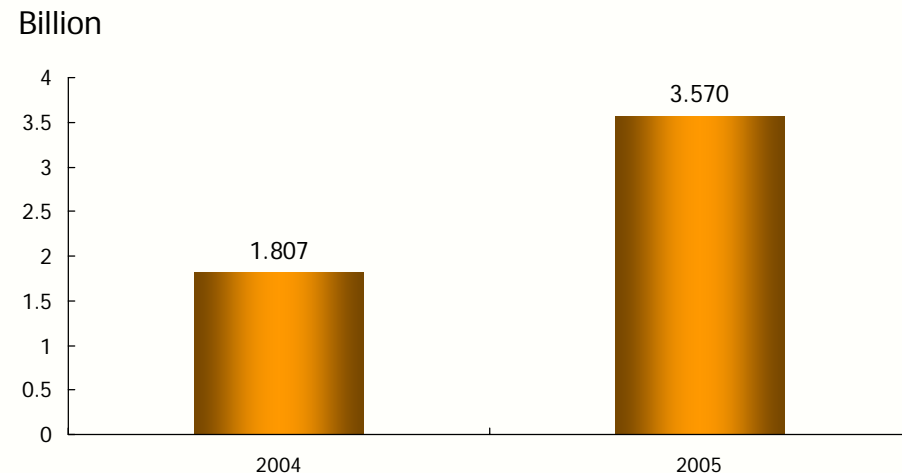
China Mobile's VAS Revenue Breakdown
(2005)



China Mobile's CRBT Revenue

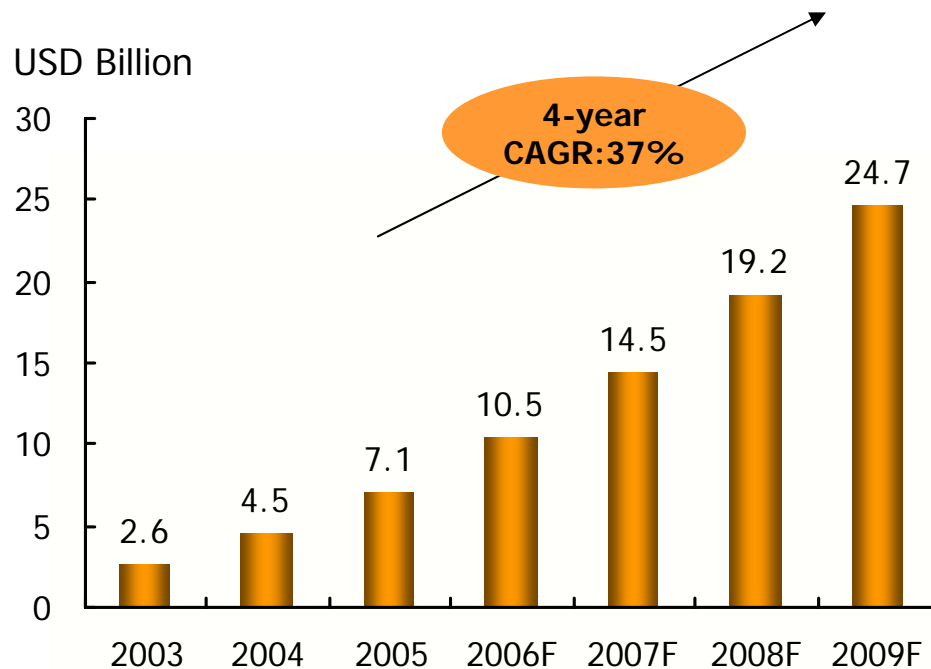


China Mobile's WAP Revenue



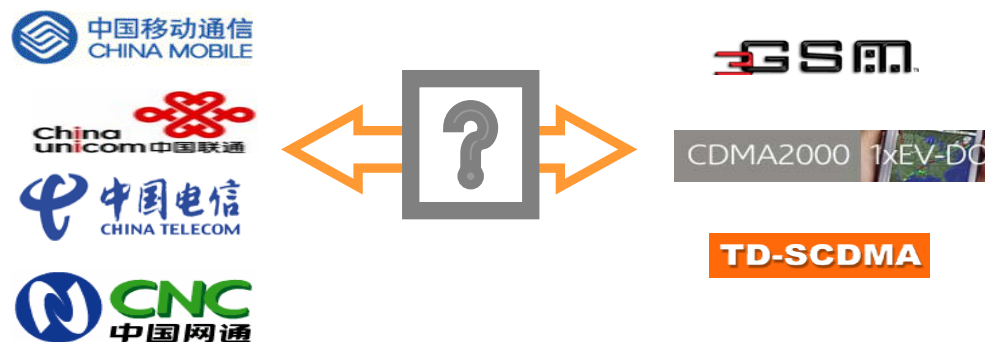
BDA forecasts USD 25 billion WVAS market (including carrier revenues) in China by 2009

BDA - China WVAS market forecast



Note: WVAS market size forecasts include revenues for both operators and content/service providers.

- Operators are promoting WVAS to slow decline in ARPU
 - WVAS revenues are growing faster than voice
- Advanced WVAS services are increasingly popular
 - Growing penetration of advanced handsets and more user demand will propel rapid growth in services based on WAP and Java platforms.
- Basic services will keep growing
 - Use of basic WVAS services such as SMS, ringtones and picture downloads will rise as penetration increases in lower tier cities.
- 3G: Commercial 3G services will feature extensive WVAS offerings



BDA view

- 3G licenses are imminent (we expect 2H 2006 or 1H 2007)
- TD-SCDMA will happen. China Telecom is likely to be granted a 3G license first to give TD-SCDMA technology a head start.
- Operator restructuring likely only after 3G licensing: 4 operators to become 3:
 - China Mobile: unchanged
 - China Telecom: acquires/leases China Unicom's GSM network
 - China Netcom: merges with China Unicom's CDMA network



- China Telecom is suffering from mobile-fixed substitution
 - Revenue growth is slowing to below country GDP growth rate
- TD-SCDMA is effectively imposed on China Telecom by government, but China Telecom can benefit from:
 - Early start in 3G
 - Probable absorption of China Unicom's GSM network
 - Tap into mobile market as a new growth driver



- China Mobile will migrate its high-end users to 3G, reducing pressure on voice capacity

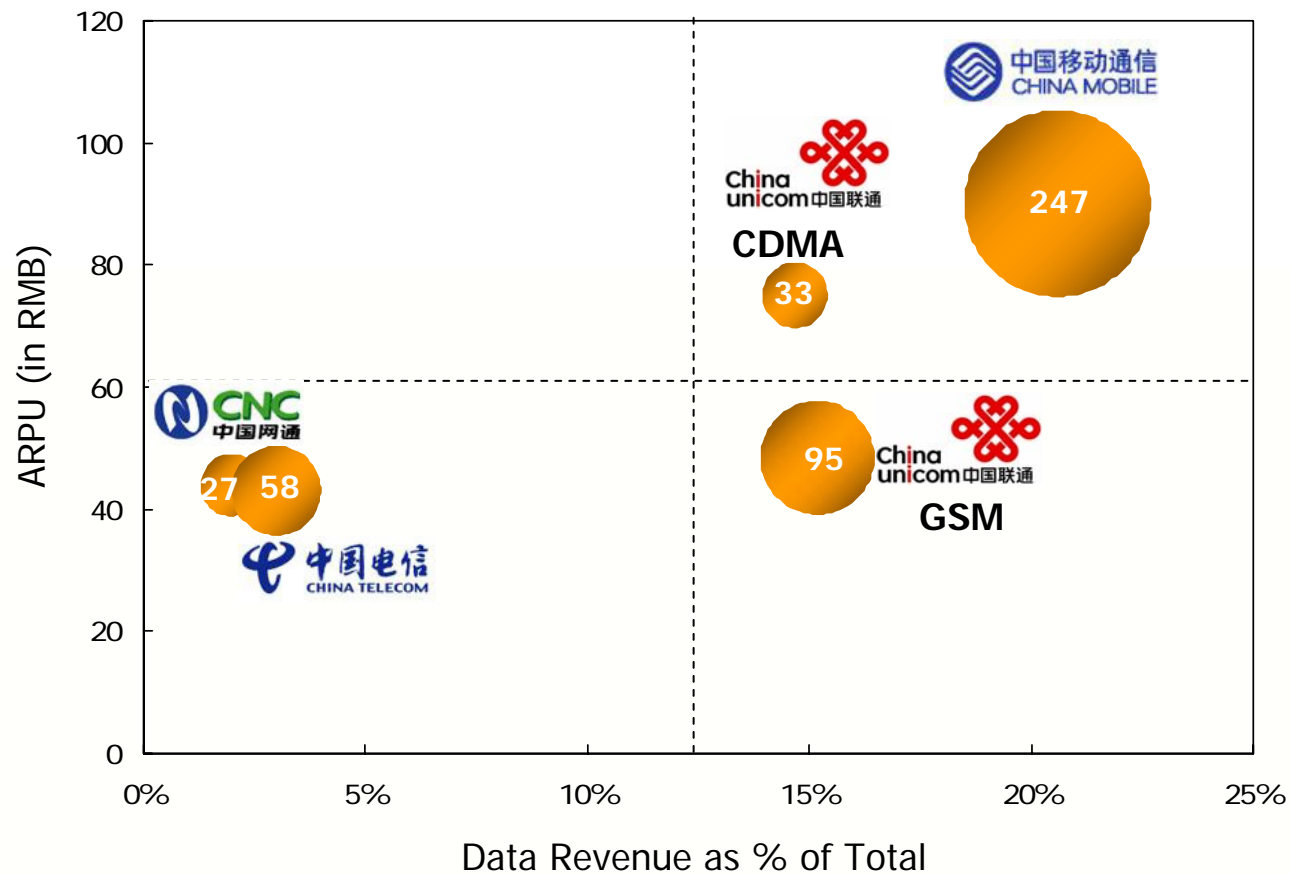


- China Unicom can easily upgrade from CDMA 20001x to EV-DO with minimal capital outlay



- China Netcom is trialling W-CDMA but awaits government decision on future of China Unicom to make further 3G plans

China Mobile is best-positioned for 3G: Strong mobile data and branding, high-end users



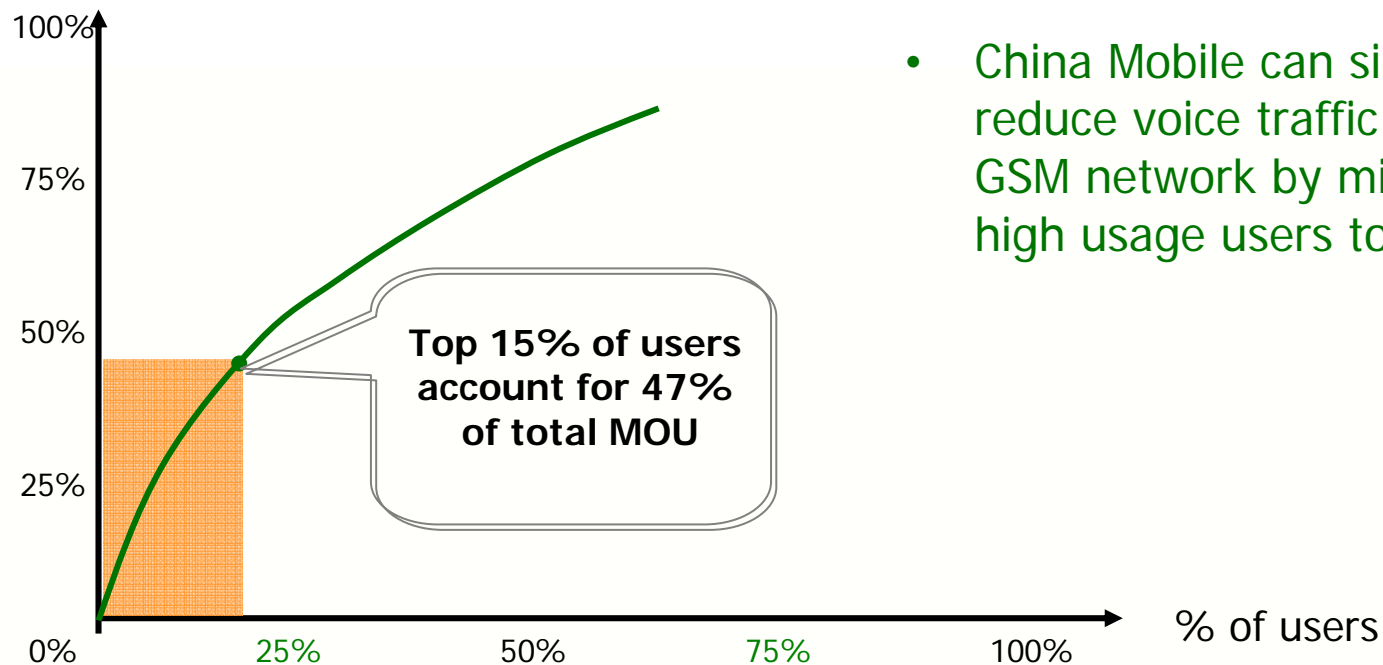
● Note: Bubble size represents user base (Million)

China Mobile will migrate its high-end users to 3G, reducing pressures on 2G voice traffic



China Mobile's Users vs. MOU

MOU as % of total



- The top 15% of China Mobile's subscriber base accounts for 47% of all voice traffic.
- China Mobile can significantly reduce voice traffic over its 2G GSM network by migrating high usage users to 3G.

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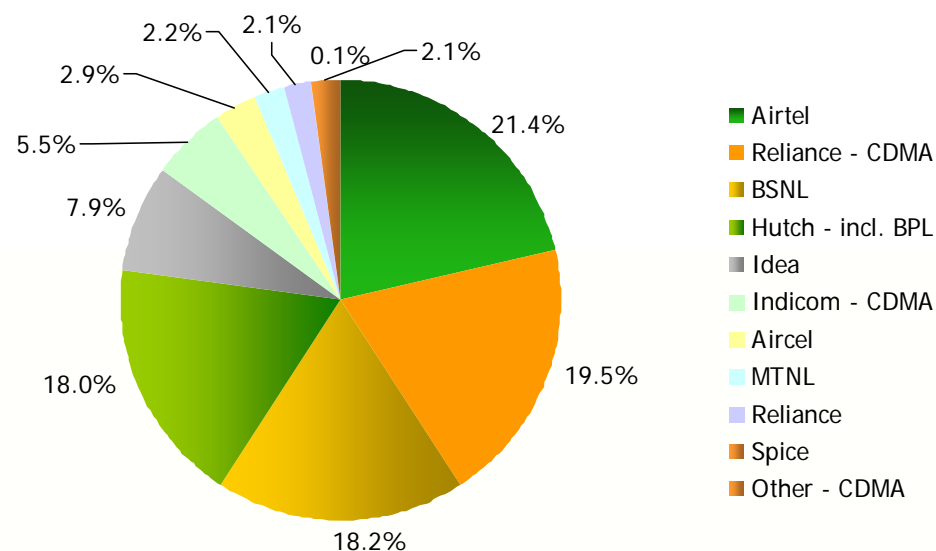


Population	1.108 billion
Fixed Subs	48.9 million (Dec 2005)
Fixed Penetration	4.1% (Dec 2005)
Mobile Subs	96.4 million (Apr 2006)
Mobile penetration	8.7%
Internet Subs	6.1 million (Sep 2005)
Internet Penetration	0.4% (Sep 2005)

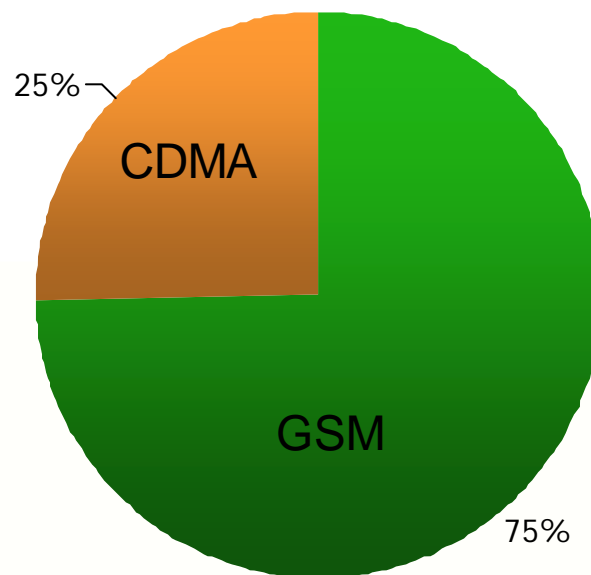
Selected market trends

- Mobile subs will surpass 100 million this month
- Recent M&A/FDI activity by Vodafone (Bharti), Maxis (Aircel), Hutchison (BPL), Telekom Malaysia (Spice) is a major vote of confidence in India's strong growth prospects and response to lifting of foreign investment ceiling to 74%
- Regulatory debate over spectrum and ADC has taken a back seat - Risks lie instead in excess competition

Operator Market Share Breakdown (April 2006)



GSM has 75% of market - CDMA continues to take 25% of new subs (Apr 2006) due to aggressive marketing

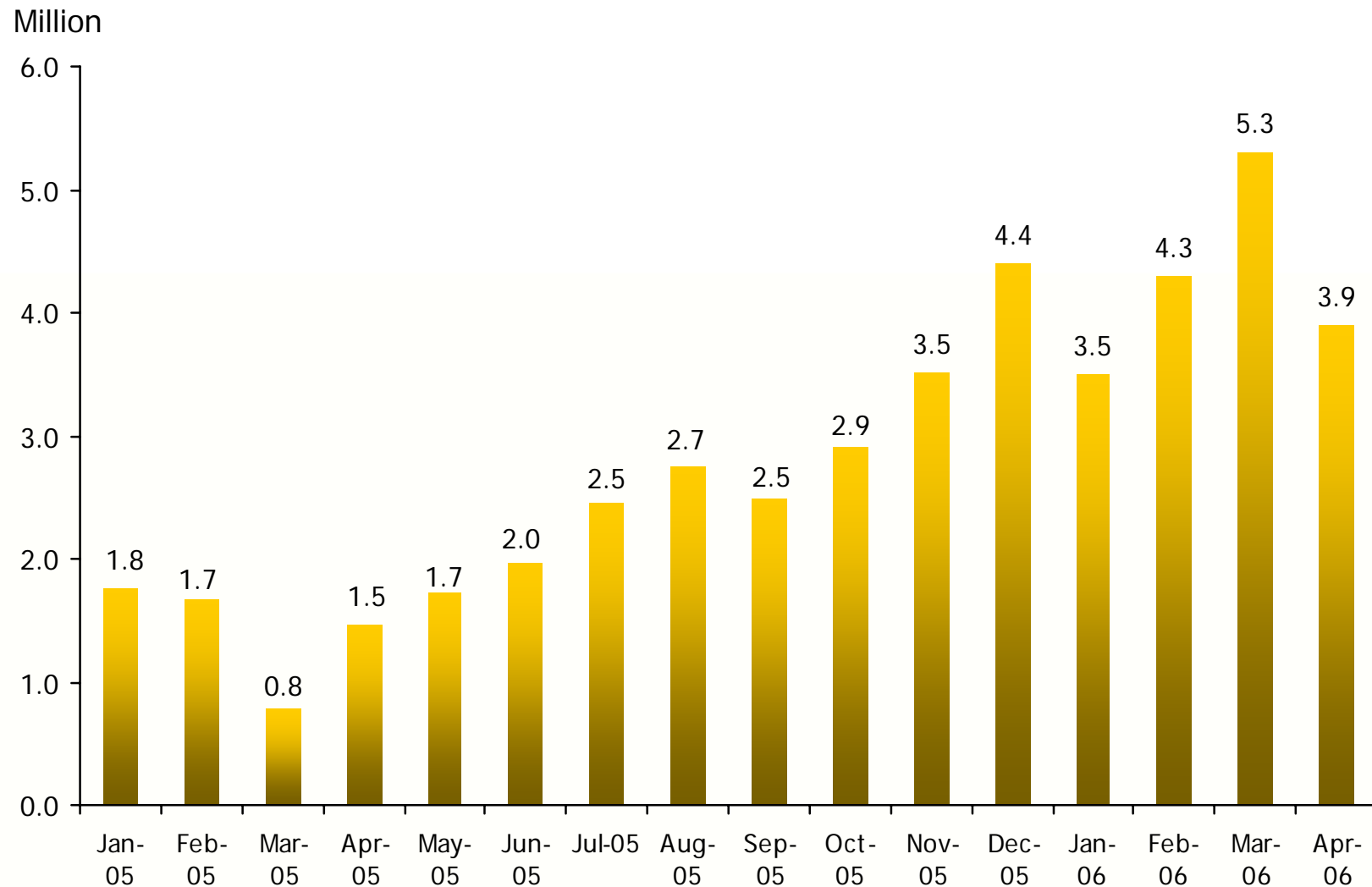


- CDMA operators Reliance and Tata-Indicom have been very aggressive with 'free for life' incoming calls, one-country tariff plans, subsidized low-cost handsets



Note: Data is for April End 2006

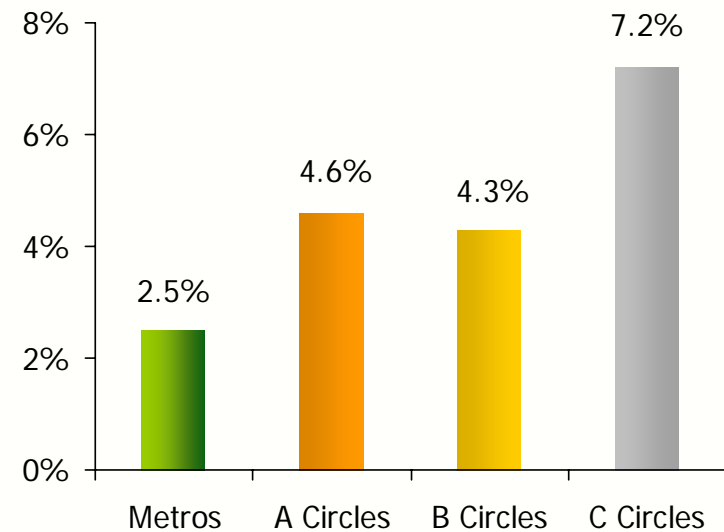
March 2006 saw an all time peak in new subscribers in India, reaching 5.3 million



Low end does not mean low growth – in fact growth is highest in poorest regions

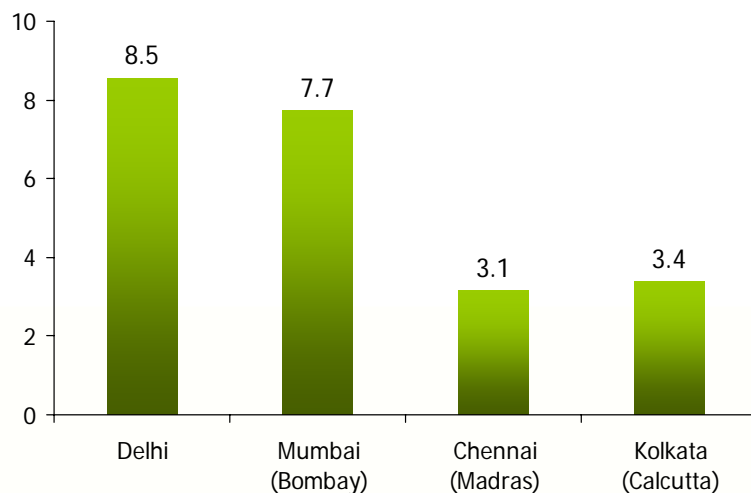


Monthly Sub Growth Rate
(April 2006)

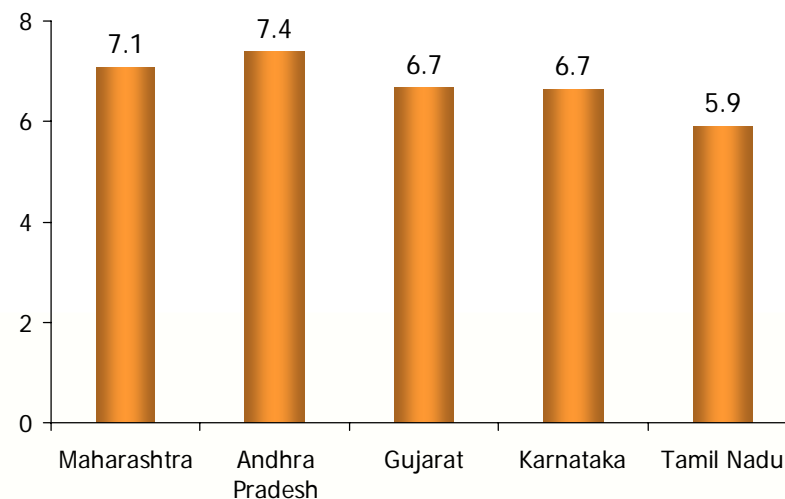


Indian mobile market: Metros, A, B & C Circles – April End 2006

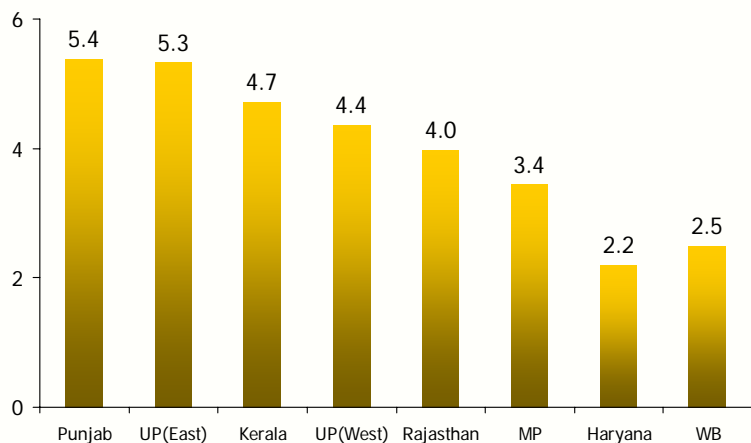
Million Subs Metros: 23.0 million subs



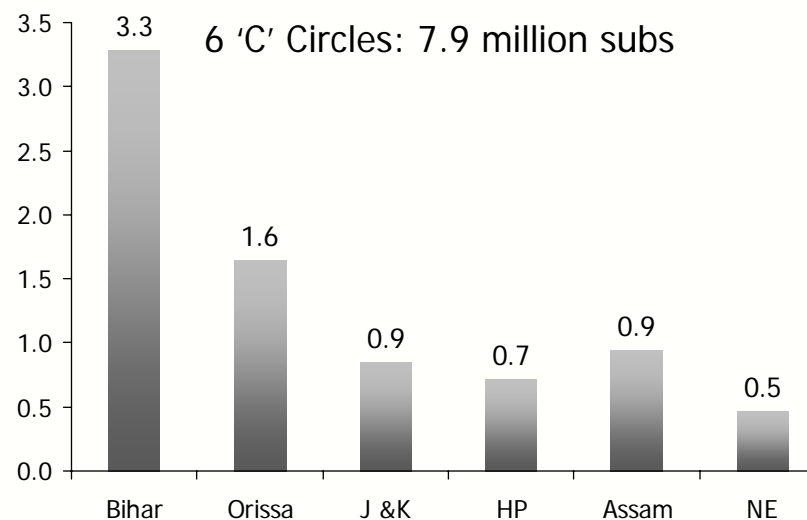
5 'A' Circles: 33.7 million subs



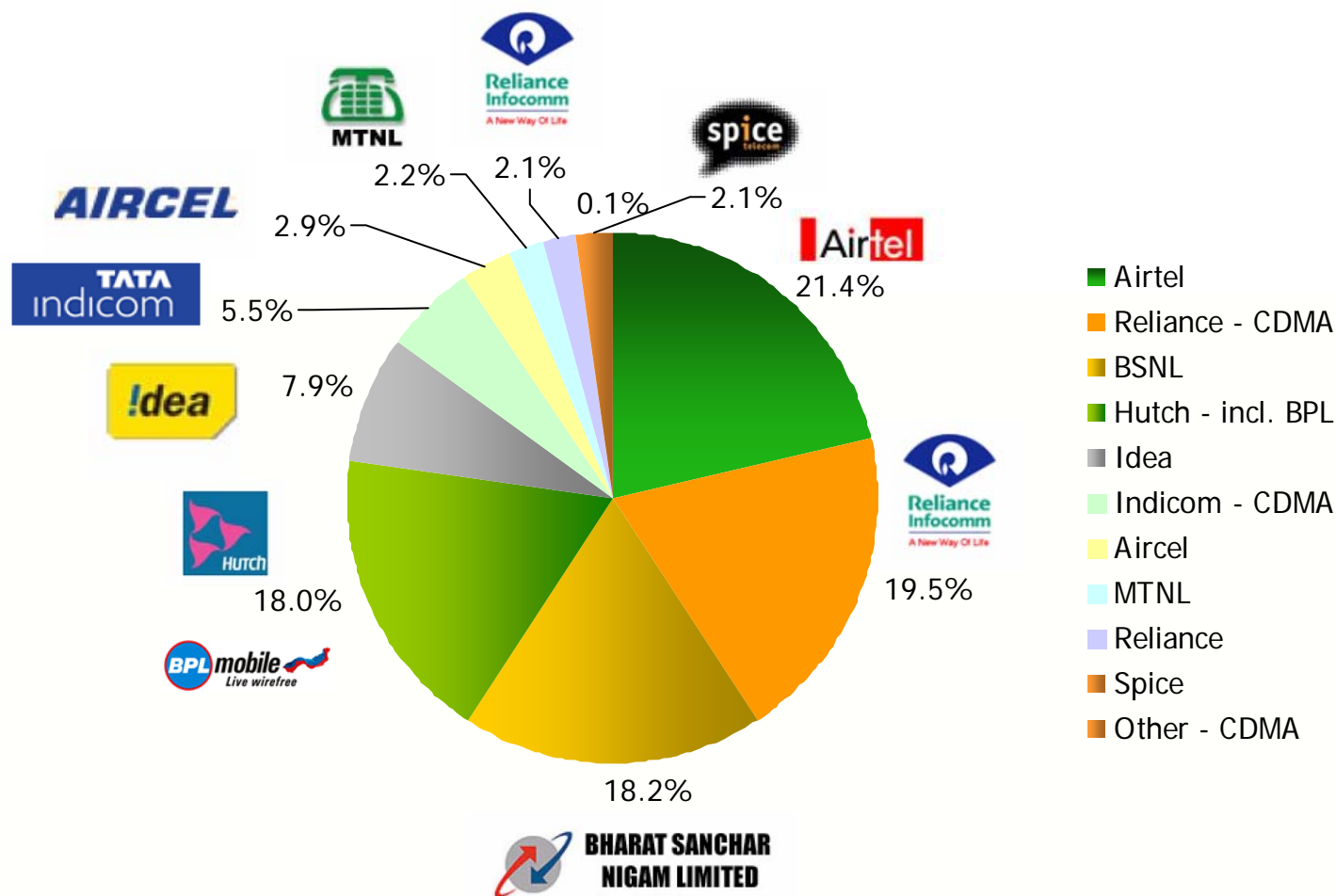
8 'B' Circles: 31.9 million subs



6 'C' Circles: 7.9 million subs



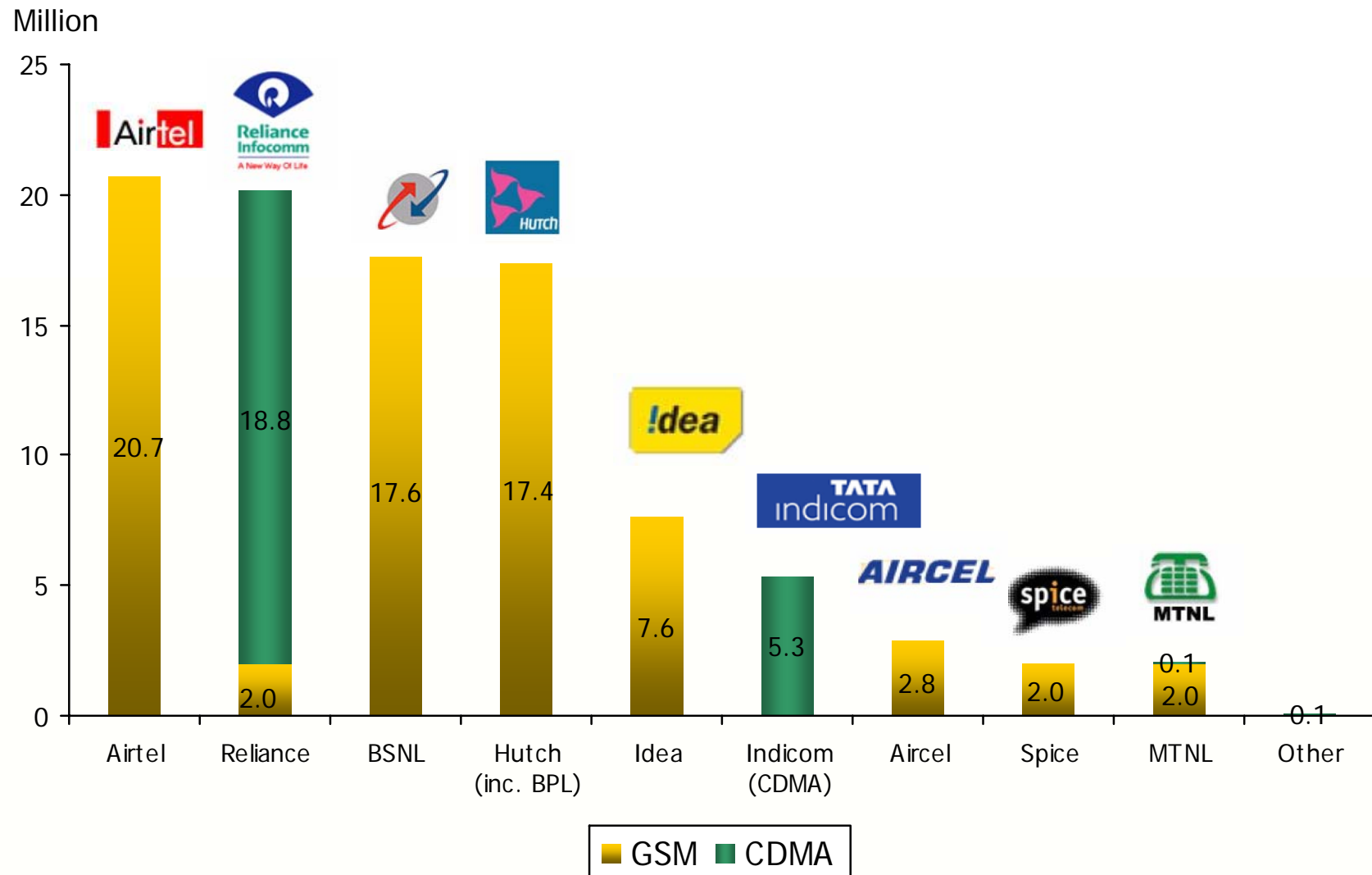
Airtel, Reliance, BSNL & Hutch (incl. BPL) have emerged as the 'Big 4' with 79% of the 96.4 million sub market



Note: GSM unless otherwise indicated. Data is for April end 2006

Indian Mobile Operators by Subs

April End 2006 – Total Market = 96.4 million



Transaction

Description



- 09/2005 USD 1.16 billion acquisition by Hutchison Telecom-Essar (in which Hutchison has a 42% stake) of BPL Mobile. After the acquisition, Hutchison-Essar/BPL ranks 2nd in India, tied with BSNL. Orascom's investment in Hutchison adds to the emerging market theme Hutchison.



- 10/2005 USD 1.5 billion investment by Vodafone for a 10% stake in Indian market leader Bharti (operator under the Airtel brand). Vodafone joins SingTel as a principal strategic investor.



- 01/2006 USD 0.8 billion investment by Malaysia's Maxis for a 74% stake in Chennai-based Aircel, which has a 3% share of the Indian market.



- 03/2006 USD 178.85 million investment by Telekom Malaysia Berhad (TM) for a 49% stake in Spice Communications Private Limited (Spice) of India, which is presently operating Cellular Phone Services in the states of Punjab and Karnataka.

India's regulatory system for telecommunications is highly transparent

MCIT
Ministry of
Communications &
Information Technology



*Dayanidhi Maran
Minister*

DOT
Department of
Telecommunications

- DOT issues licenses and is responsible for frequency management

TRAI
Telecommunications
Regulatory
Authority of India



*N. Mishra
Chairman*

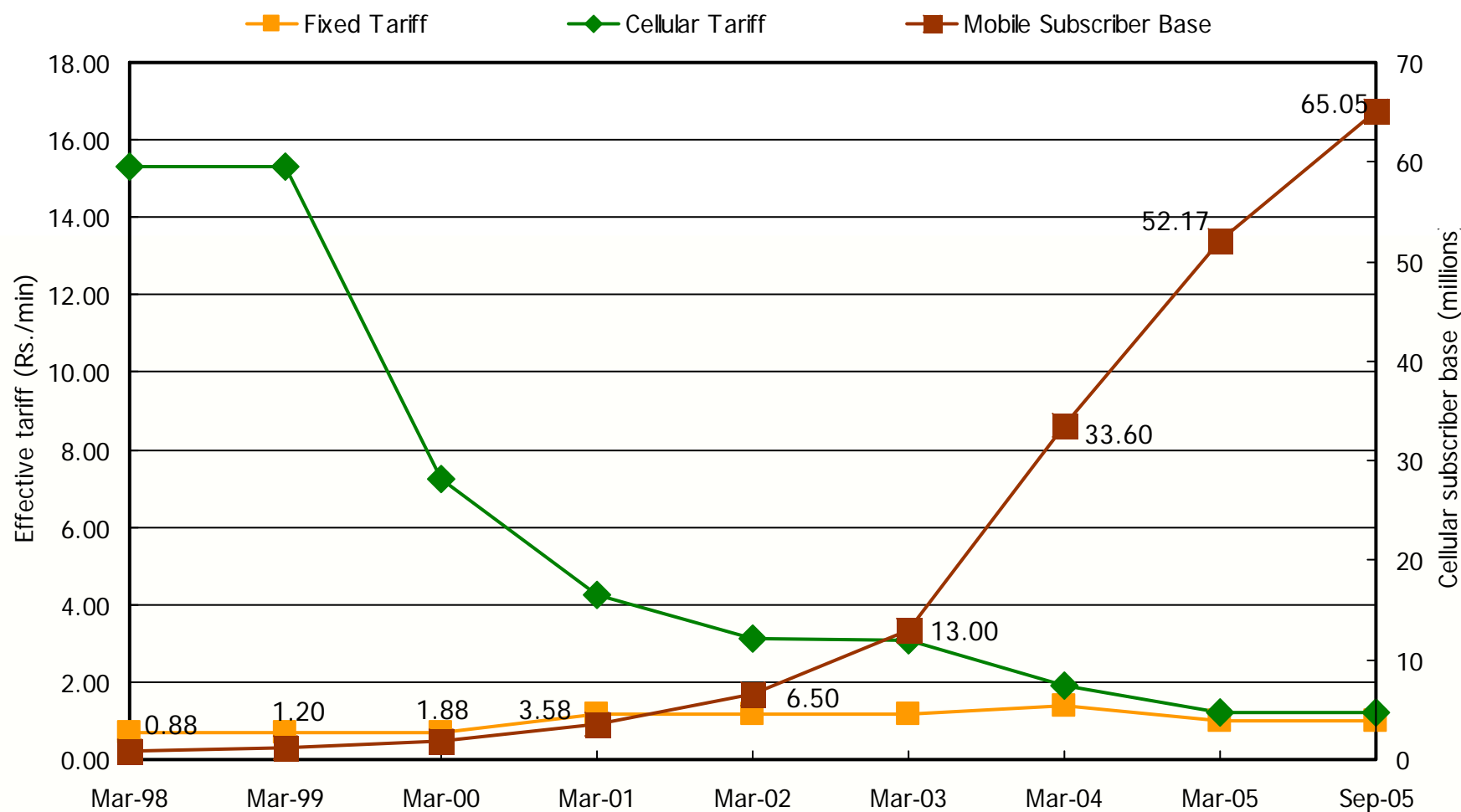
- Founded in 1997 as an independent regulatory body, TRAI's role is primarily consultative. TRAI can arbitrate in disputes between Government and licensees.

TDSAT
Telecommunications
Dispute Settlement
Appellate Tribunal

- Established in 2000, TDSAT has the power to adjudicate disputes between licensees, or Government and a licensee

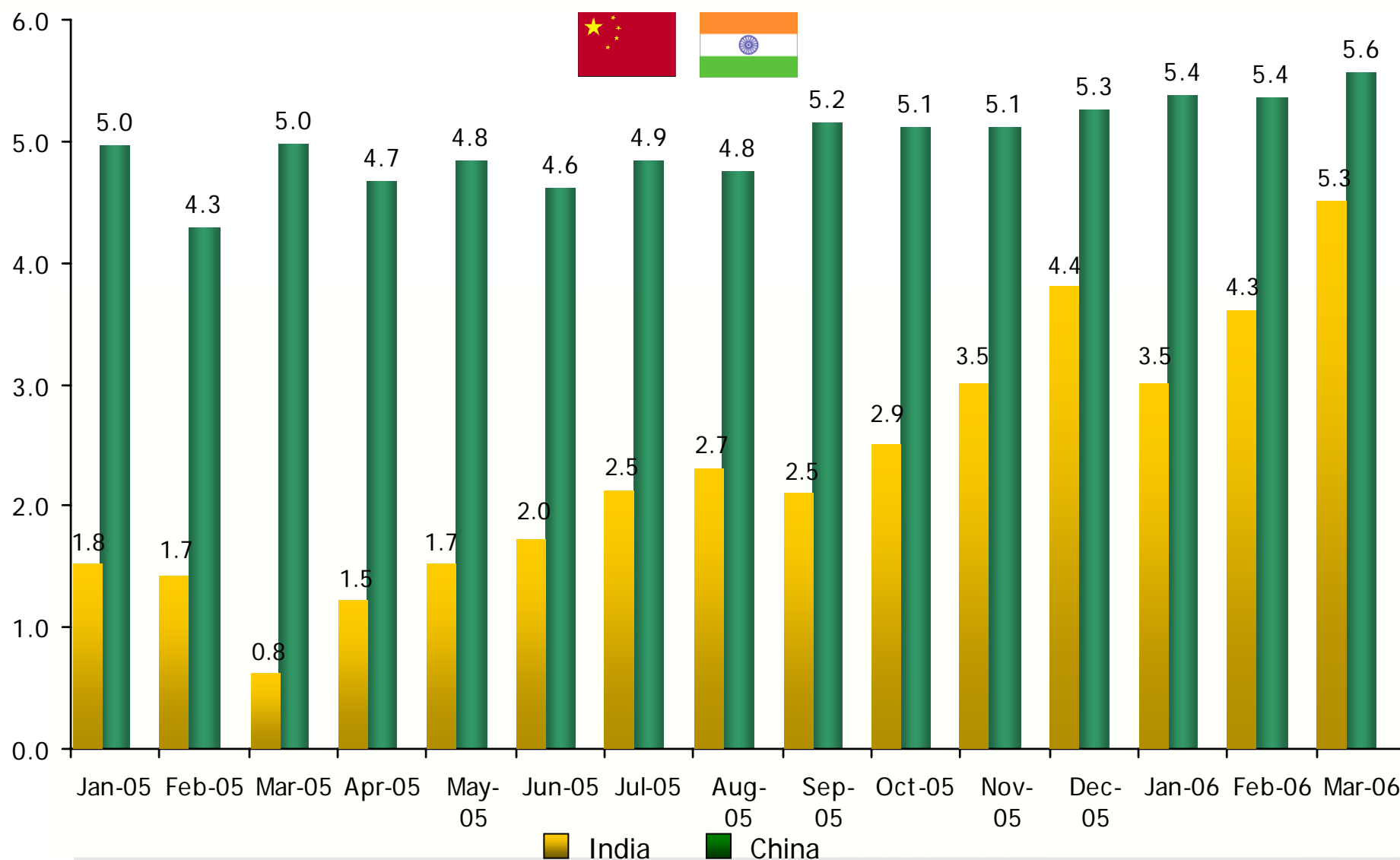
Tariff reductions and an improved regulatory structure have unlocked growth in India

- Cellular subscribers and effective tariff per minute



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India's monthly mobile subscriber additions are catching up to China's 5.4 million per month

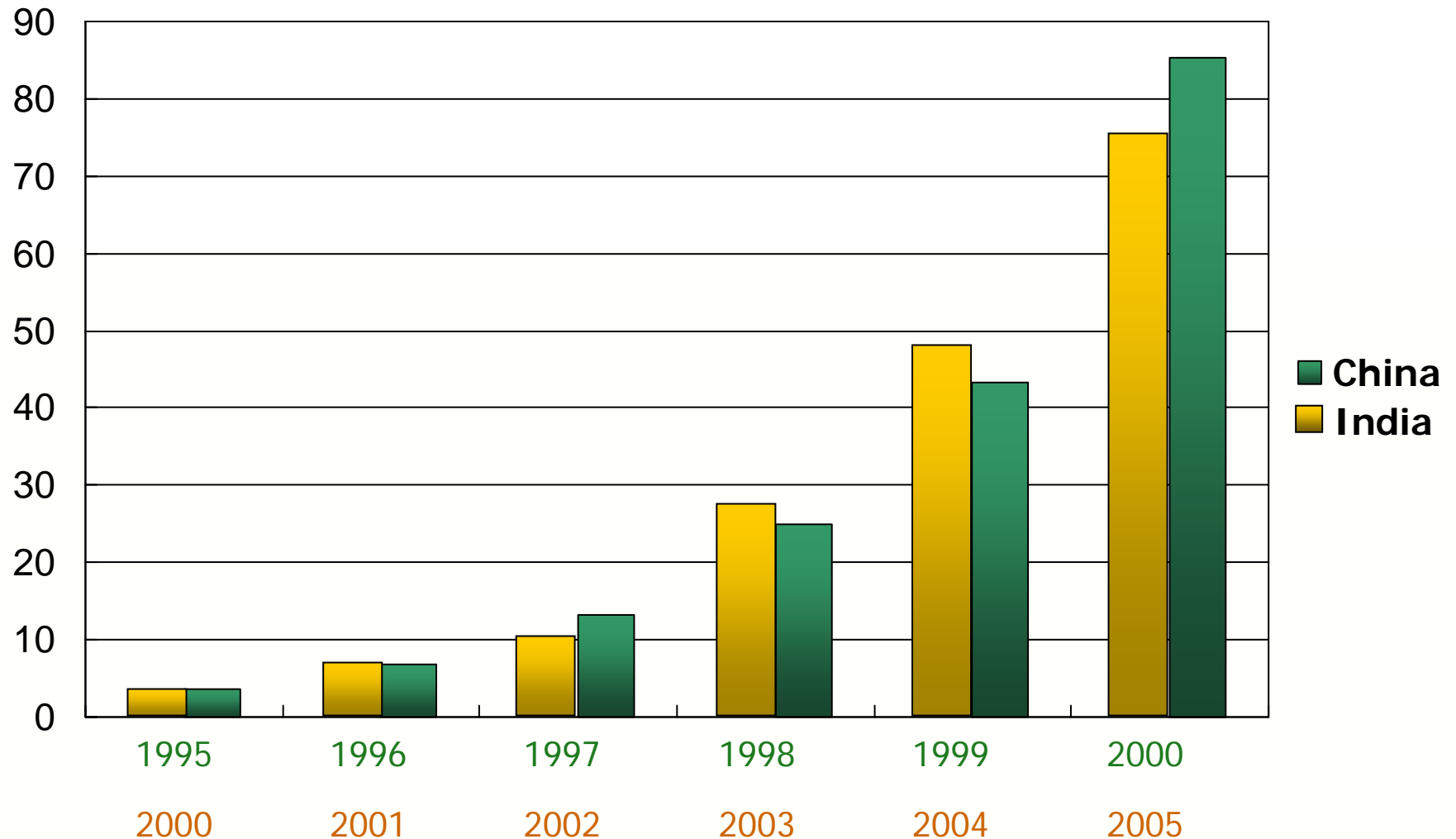




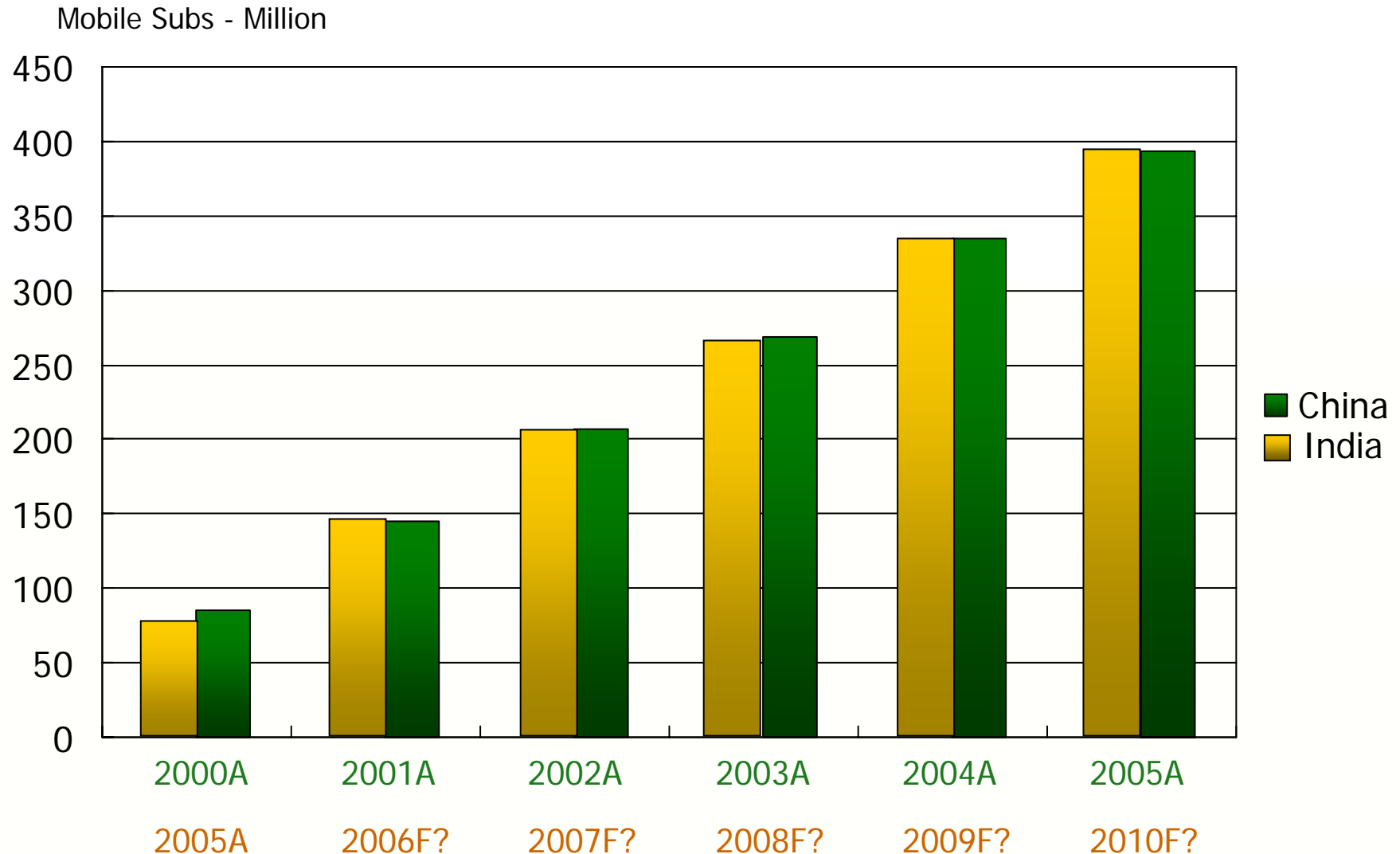
Strong GDP growth	>8%	>9%
Large population	1.09 billion	1.31 billion
Large rural population	est. 700 - 780 million	
	c. 72% of pop	c. 60% of pop
Young population base (20 – 24 year olds)	> 100 million	
	India average age will remain young	China aging much faster
Strong education, science & technology base (engineering graduates per year)	>150,000	>250,000
Mobile subscribers have surpassed fixed line subs	Passed in 2004	Passed in 2002
Significant penetration upside (current penetration)	8.7% (Apr)	30% (Apr)

India's mobile subscriber growth has born a striking resemblance to China, offset by 5 years

Mobile Subs - Million



But can we take China's experience over the past 5 years as an indicator for India over the next 5?

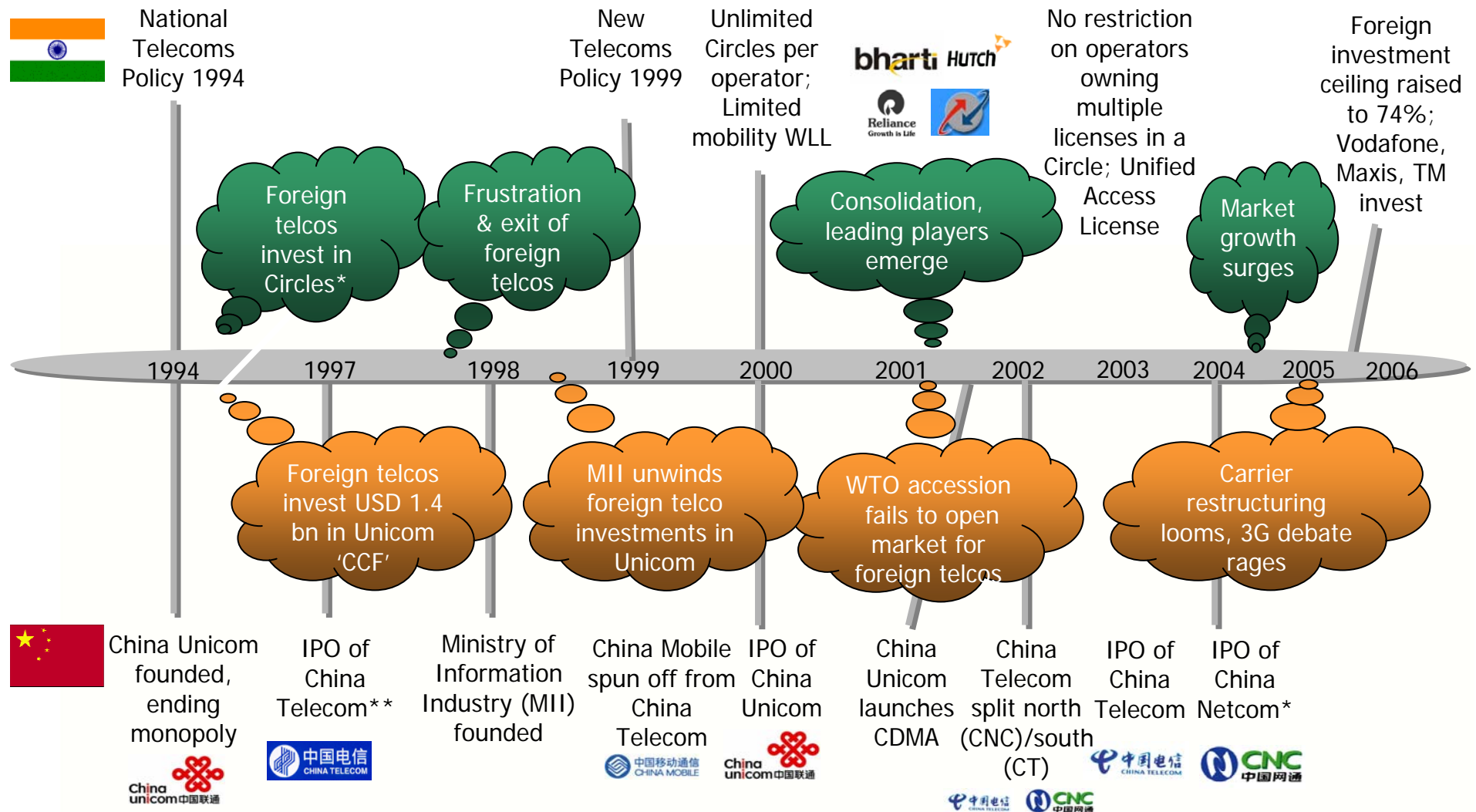


The two markets differ in a number of important factors:



GDP per capita (USD)	USD 638	USD 1,269
State and pace of urbanization	28% of pop	40% of pop
Number of mobile operators	>7 with >1% market share	Only 2 nationwide
Ownership of mobile operators	Mostly private capital	Majority state-owned
Telecom equipment manufacturing	Nascent capacity, now seen as priority market for multinationals	Major global centre for manufacturing, launch-pad for homegrown contenders

India's regulatory system held the market back, but reforms have largely corrected this. China has powered ahead, but now faces the legacy of state ownership.



* 4 metros and 19 circles (5 'A', 8 'B' and 6 'C')

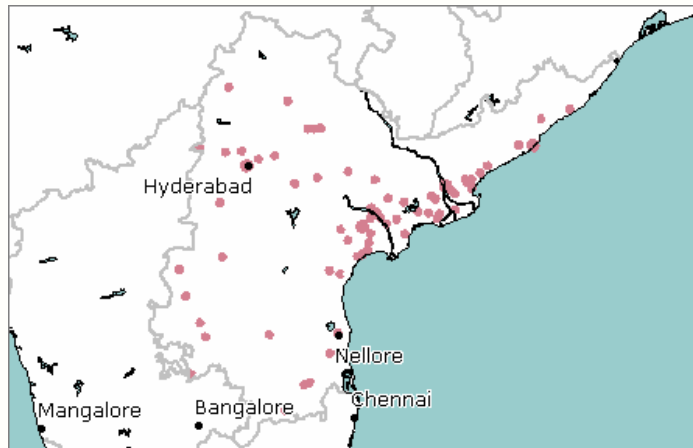
** Mobile assets of China Telecom, commencing with 2 provinces

India's regulatory system led to excessive carrier fragmentation, and poor coverage



Mobile network coverage:
Fragmented (22%)

Sample coverage map:
Andhra Pradesh (Hutchison Essar South Limited)



Source: GSM Association



Mobile network coverage:
Nationwide (96%)

Sample coverage map:
Jiangsu/Shanghai/Zhejiang (China Mobile)



Source: GSM Association

bda

In India, entrepreneurs/capitalism reigns.
In China, bureaucrats/'informatization' rules



Sunil Mittal,
Bharti Televentures CEO



Anil Ambani
Reliance Infocom



国务院国有资产监督管理委员会
State-owned Assets Supervision and Administration
Commission of the State Council



中华人民共和国信息产业部

Ministry Of Information Industry Of the People's Republic Of China



Policy of 'Xinxihua' (信息化)
Informatization



India's regulatory environment imposed a heavy burden on carriers, but reforms are underway

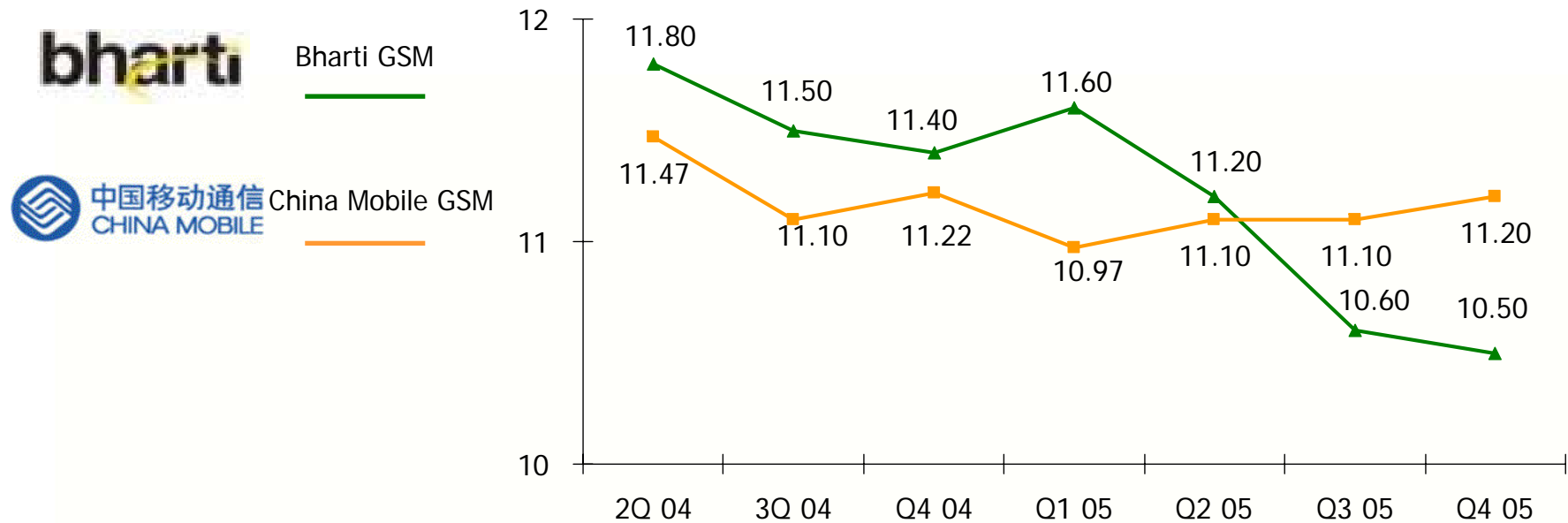


Service Tax (% of revenues)	12.24%	3%
License Fees (% of revenues)	6 - 10% depending on Circle	None
Spectrum Charge (% of revenues)	2 - 6%	<0.5% (China Mobile)
Total Regulatory Charges	18-26% + GST	<3.5%

Source: BDA, TRAI

- In addition, India charges an import duty of 5% on handsets and 16% on equipment and most equipment is imported.
 - China also charges duties (of 10% for handsets and 5-10% for equipment) but as most handsets and equipment are manufactured in China, these duties have little impact.

China Mobile and Bharti ARPU Comparison (in USD)



WVAS: India is more of a walled garden, China opted for openness which has stimulated the market



Revenue Sharing Arrangement

- 70% to 80% to operator
- 20% to 30% to content developers

- 15% to operator
- 85% to content partners

Mobile Data as % of Total Revenue

- 10% in 1H 2005
- 26% by 2010

- 20.6% in 2005
- 28% in 2010

Operator Approach on Content

- Walled garden approach
- In-house development






- Open System
- Limited in-house development

Popular Mobile Data Services

- SMS
- Ring-back tones
- Ring-tone music

- SMS
- Color Ring-back Tones/IVR
- WAP, JAVA and MMS

China Unicom has the richest valuation while India Bharti is trading at a discount

Selected Listed Operators	 		  	
EPS (USD)	0.18		0.34	0.05
Net Profit (million USD)	326		6601	584
P/E	0.97		2.27	2.38
EBITDA Margin	33.6%		54.7%	32.7%
Market Cap (million USD)	14,171		118,295	10,804

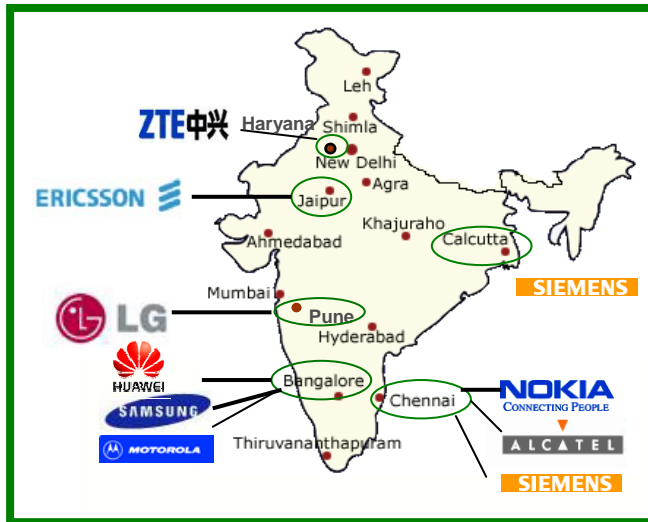
India differs substantially from China in that it has limited nascent manufacturing capability

- Indian Minister for Communications and Information Technology
 - “We feel that if we are going to add another 150 million subscribers by 2007, we cannot depend entirely on imports of equipment ... We need the equipment to be manufactured in our country.”



Dayanidhi Maran

Major telecom equipment manufacturers are now increasing production and R&D in India



Plant in Jaipur started operation Feb. 2005



10th global manufacturing base to be set up in Chennai with investment of USD 150 million for GSM and CDMA handset manufacturing. 2,000 employees.



USD 600 million invested in India for GSM/DSL production and R&D centers. USD 47 million broadband wireless research centre in Chennai announced Sep 2005.



Factory to be built soon. Annual investment on R&D in India has reached USD 17 million.



R&D in Bangalore. Manufacturing in Calcutta.



Factory opened in March 2005, producing CDMA, GSM, handsets, DSL and NGN



One R&D center in Bangalore. USD 100 million will be added for new production base and R&D center.



Entered India market in 1997. Most handsets produced locally. Two R&D centers in Bangalore and Noida.

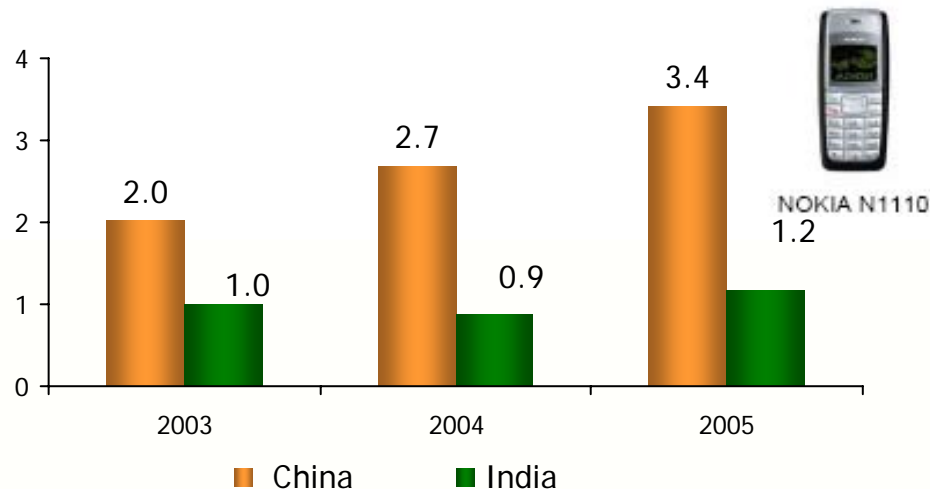


Investing in GSM and CDMA in Pune. Expecting sales of 6 million handsets in the first year of operation and will invest USD 60 million by 2010.

Nokia has set up a manufacturing facility in Chennai, India



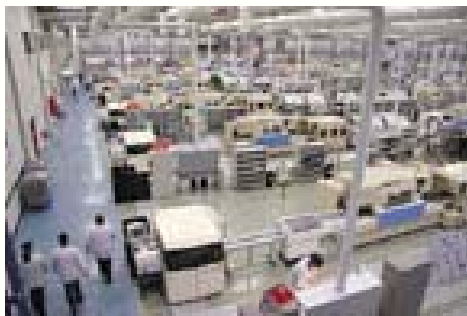
Net Sales of Nokia in China and India (€ billion)



- In 2005, net sales of Nokia were €34.2 billion.

	China	India
Market % of total net sales	41%	31%
Rank	No.1	No.4

Nokia in Chennai

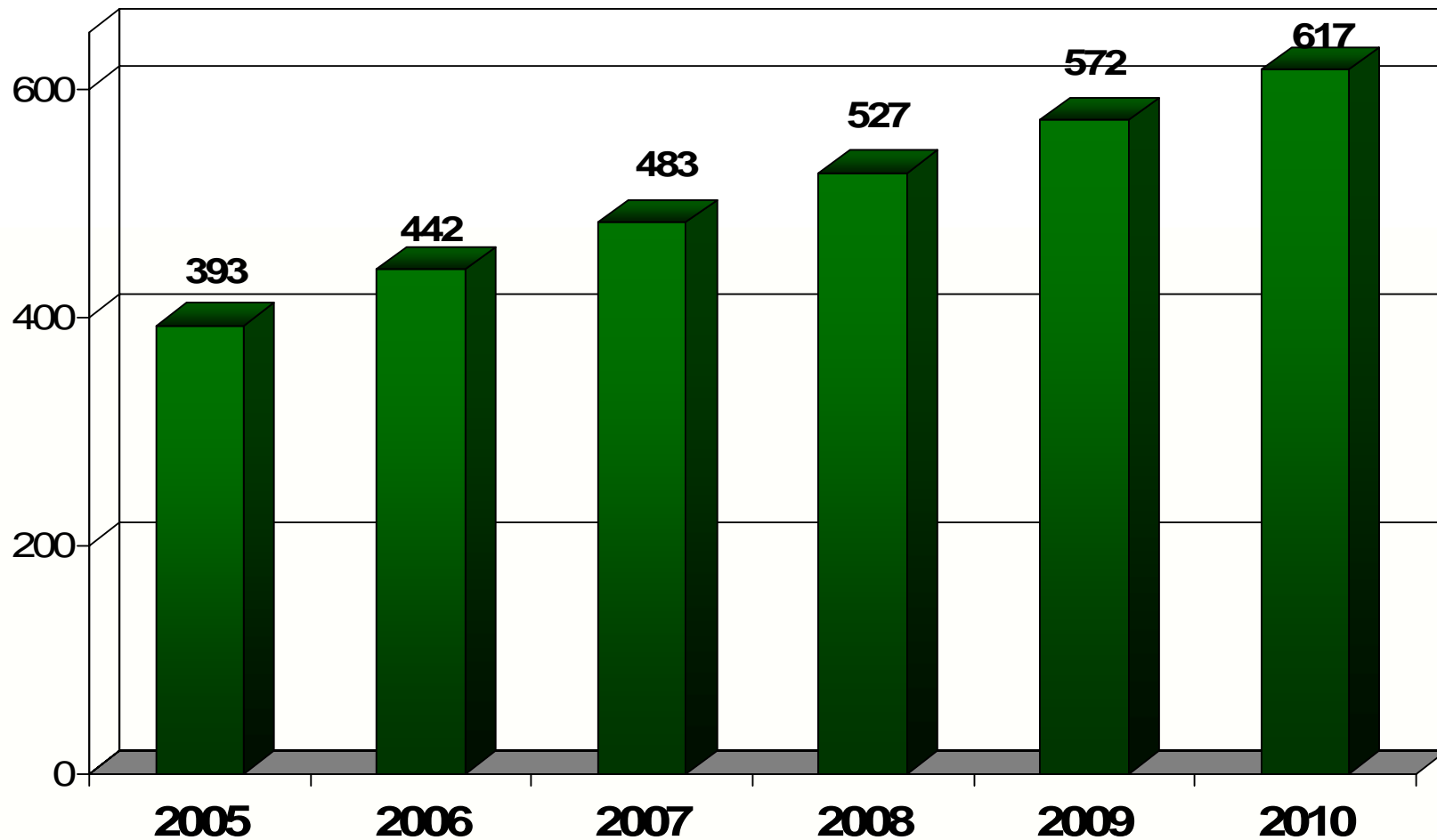


- Nokia invested USD 150 million and hired 1100 employees
- First equipment vendor to manufacture both mobile devices and network infrastructure equipment in India.
- Achieved milestone of manufacturing over 1 million handsets in India to-date.
- Nokia believe India will become the 2nd biggest mobile device market in the world in 2010

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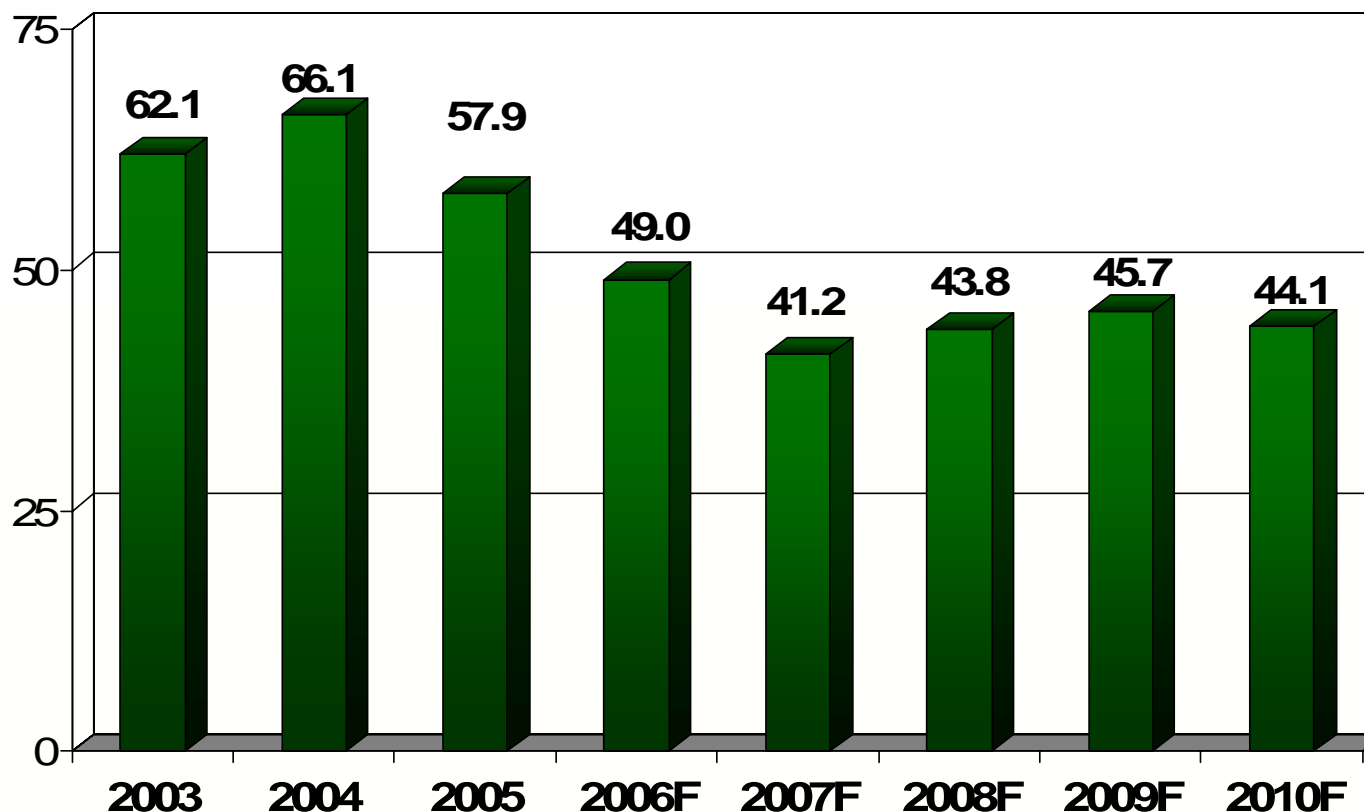


Mobile Subs - Million





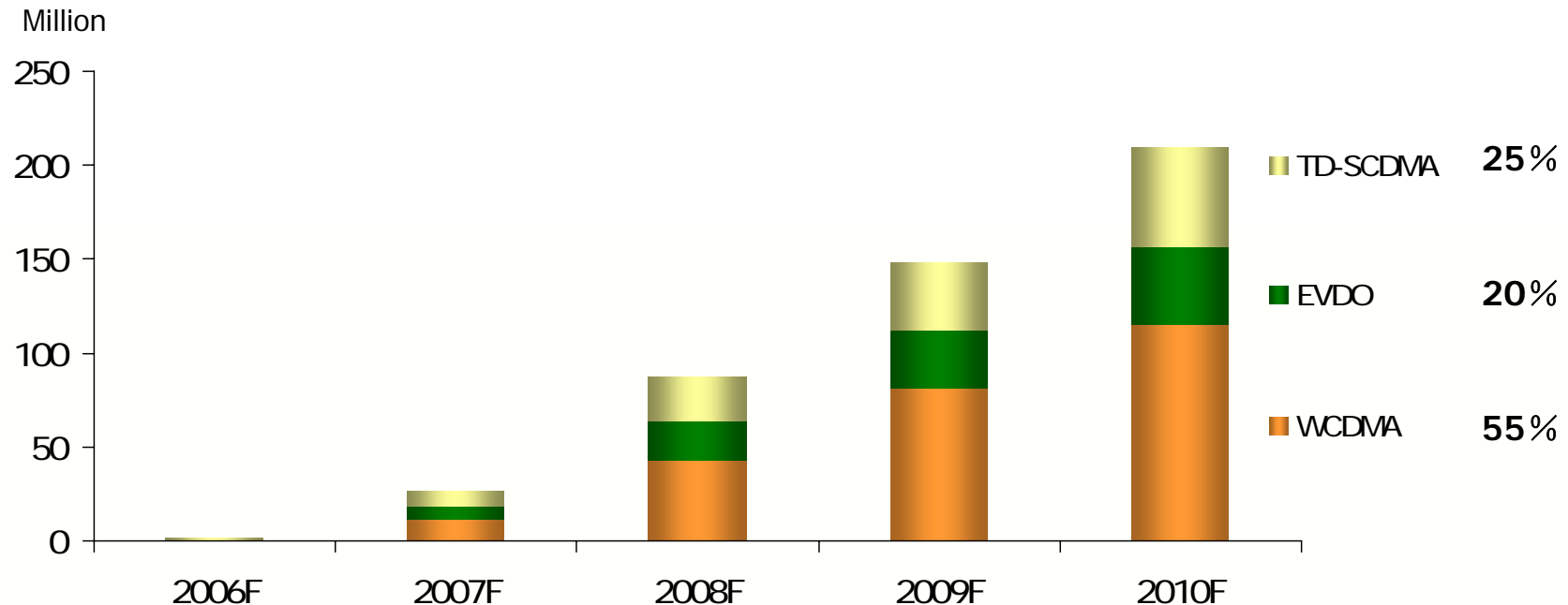
Mobile Subs - Million



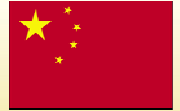
- **Real name registration policy**, if enforced, will have a significant negative impact on mobile subscription. The policy is expected to take effect sometime 2006
- **New subscribers** are expected to come from lower-tier cities and rural area where mobile penetration is still very relatively low.



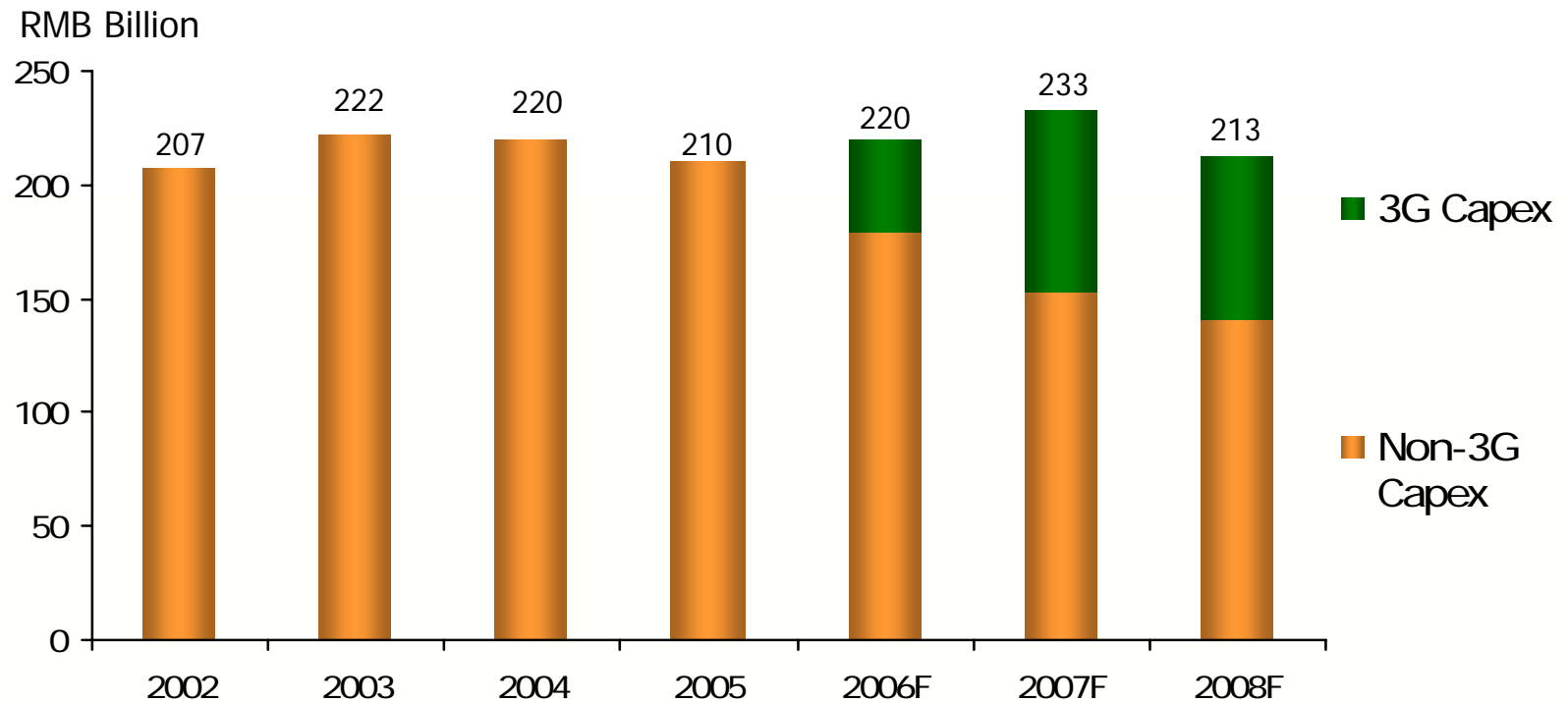
2006-2010 3G Subscribers by Technology



- **TD-SCDMA** will gain a greater share of the China 3G market than **EV-DO** because **China Telecom** will play **fixed-mobile convergence** (e.g. single bill) and tap into its **large corporate user base**.
- **China Unicom** has a smaller sub base than **China Telecom** and continues to suffer from legacy of **CDMA subsidies**



2002—2008 China Telecom Capex Forecast



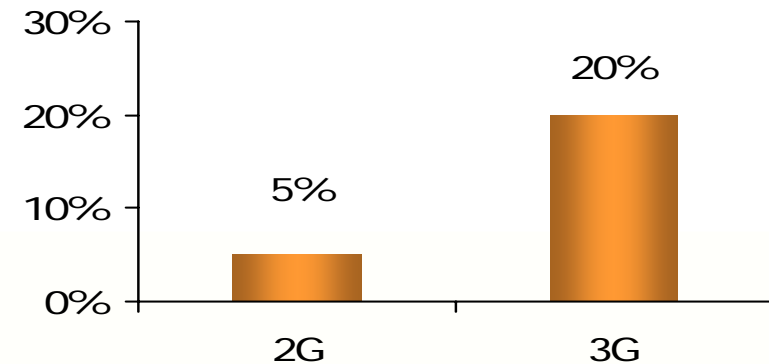
Huawei & ZTE had 5% of China's 2G (GSM) market
- BDA expects this to increase to 20% in 3G



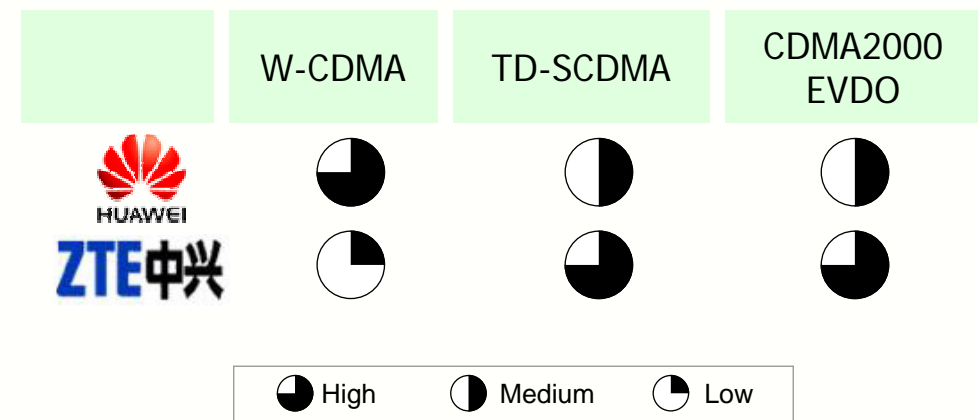
China Mobile's Principal
2G GSM Infrastructure Suppliers



Huawei and ZTE: 2G vs.
BDA Forecast 3G China Market Share

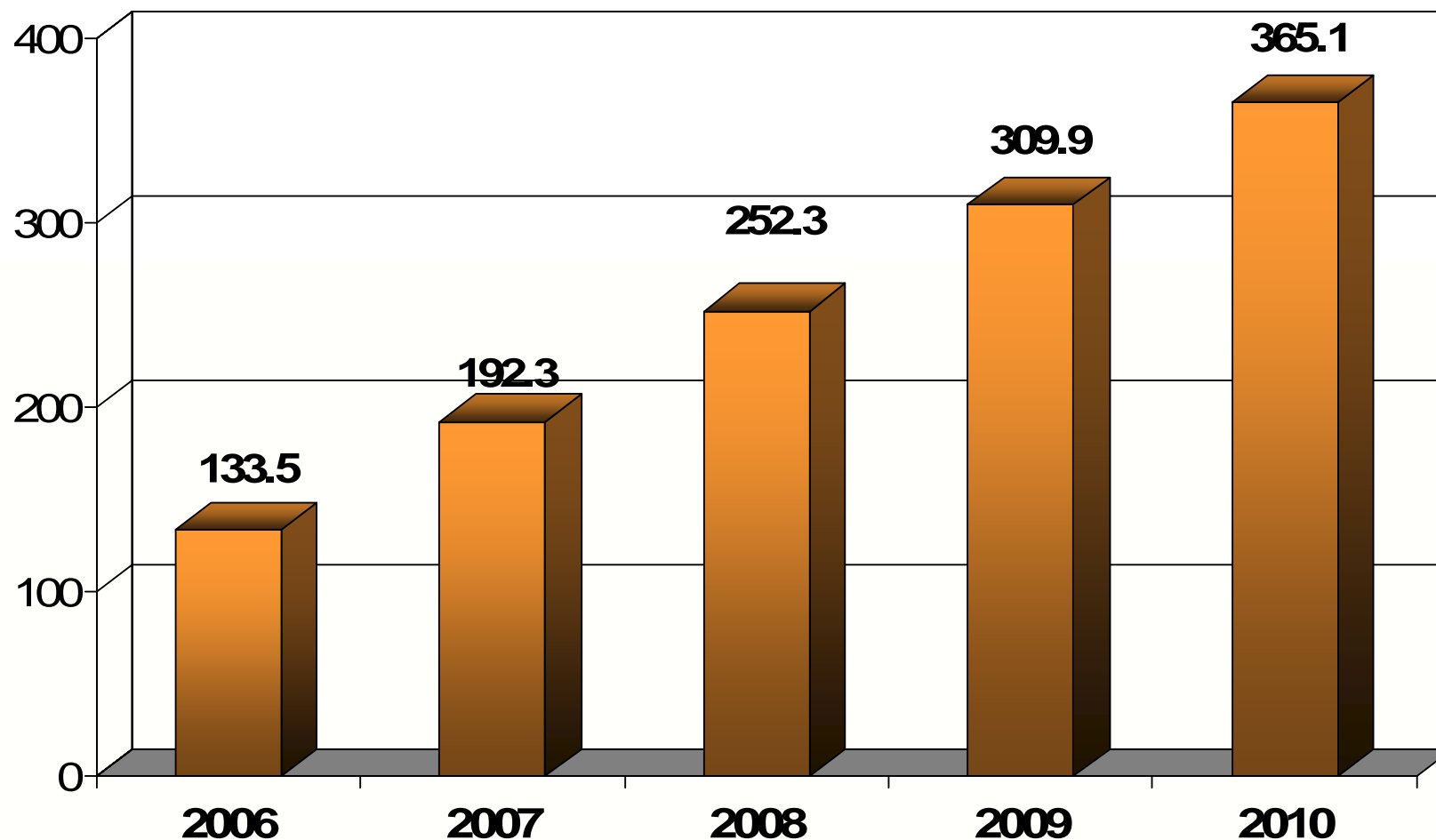


3G Product Competency Comparison

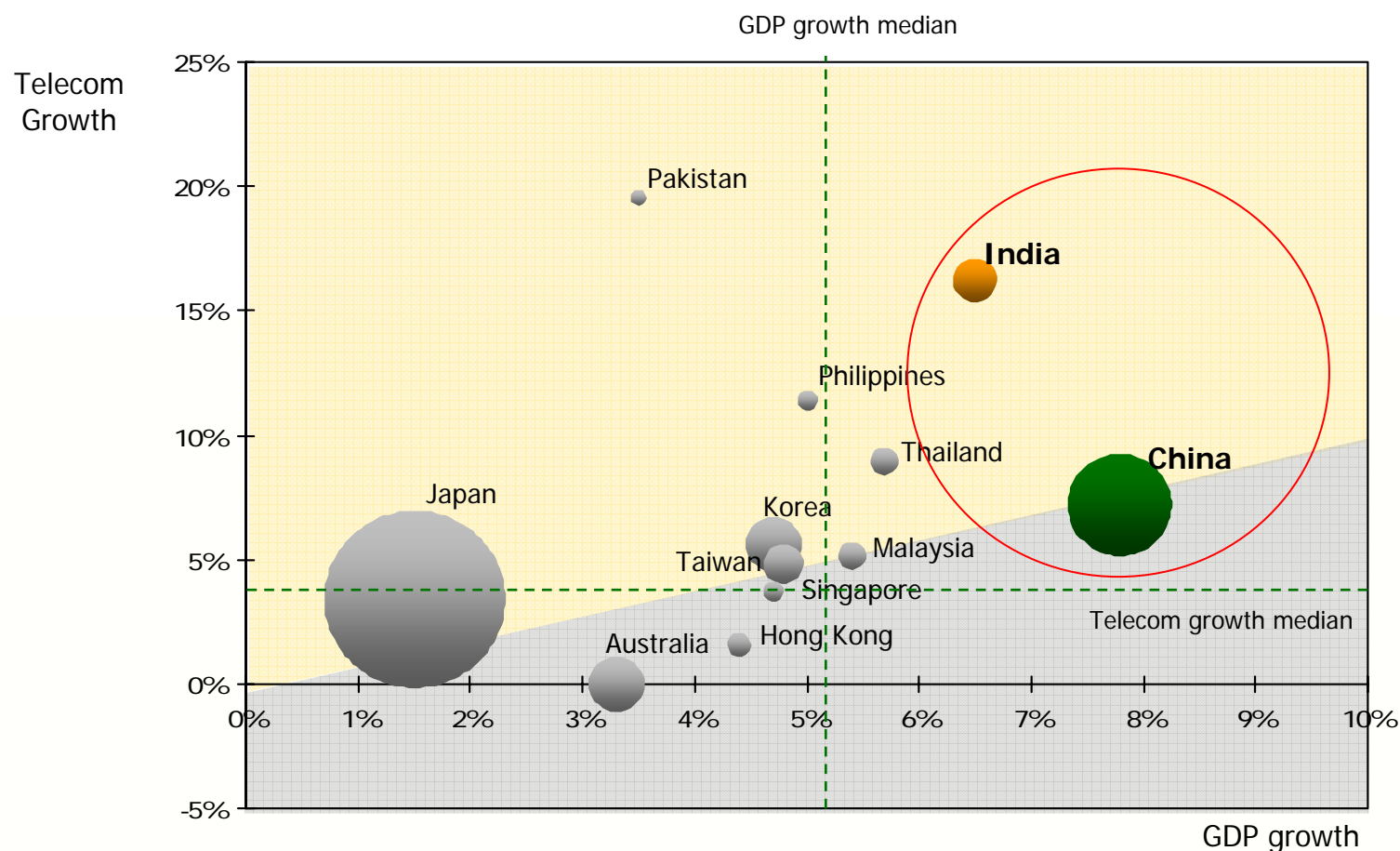




Mobile Subs - Million



Indian telecoms will grow much faster than GDP, while China market is maturing



1. The growth rates show the CAGR for the 2004-2010 period.

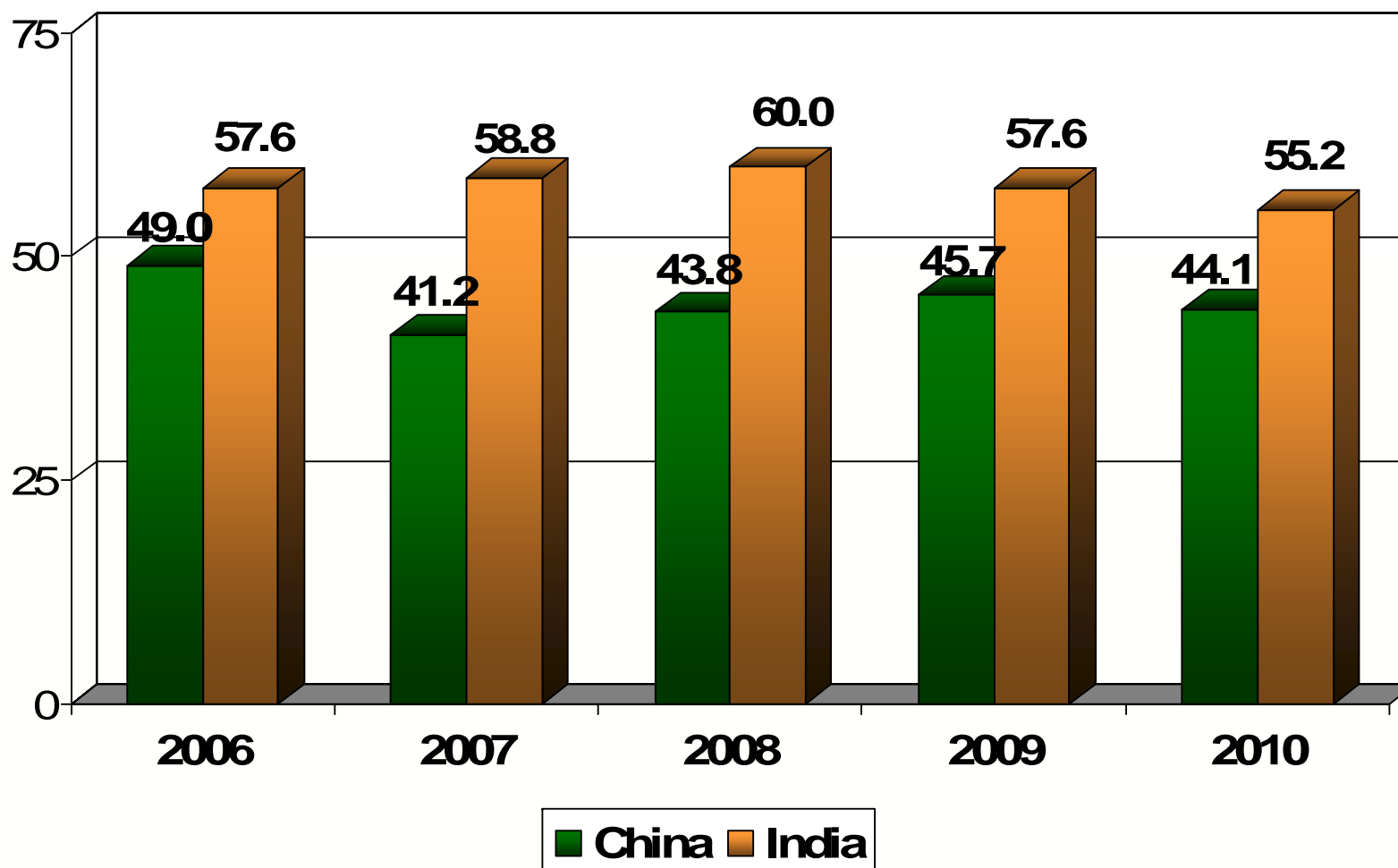
2. The size of circle indicates telecom revenues in 2004.

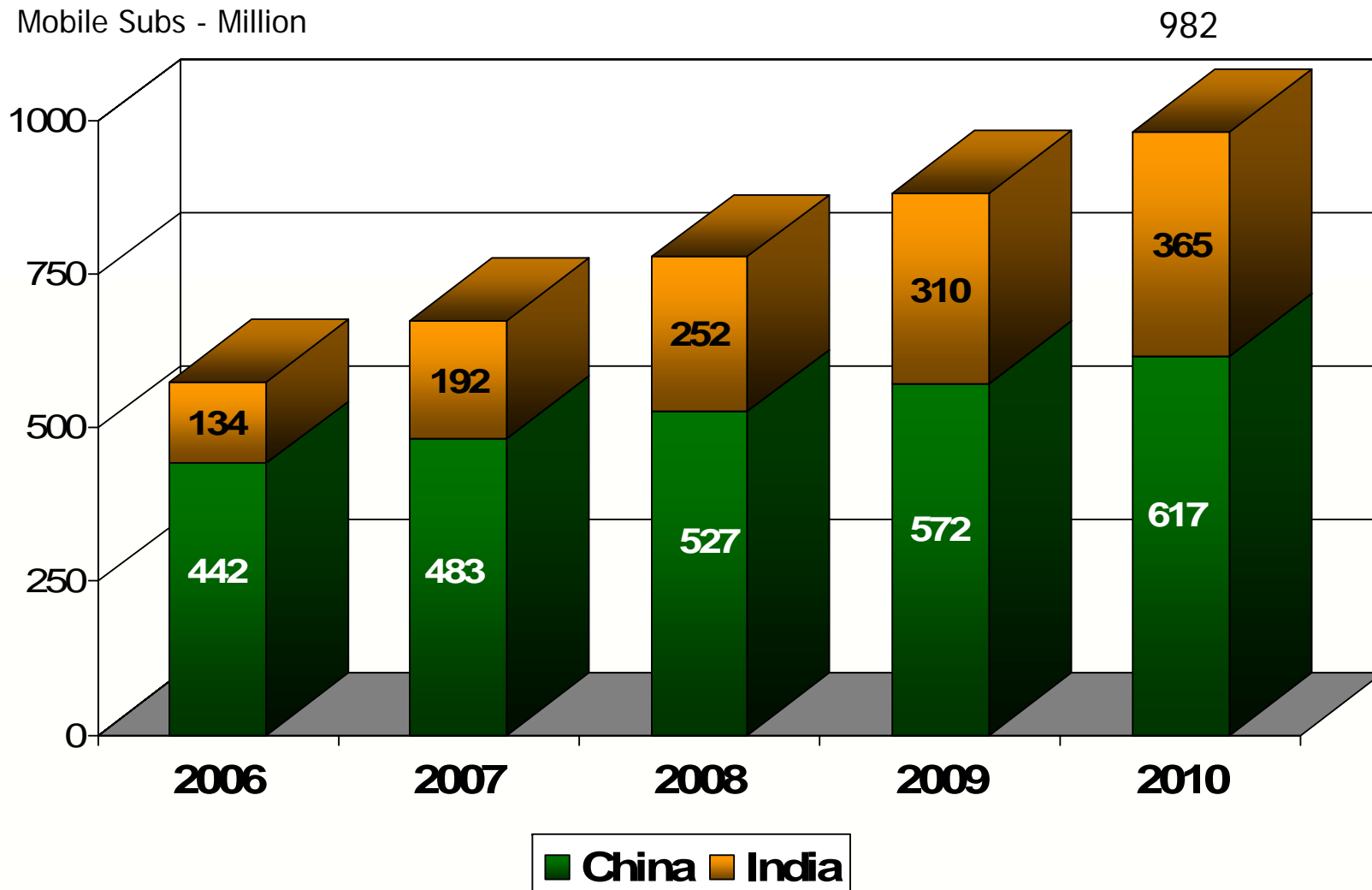
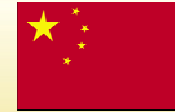
3. Vietnam, Indonesia, Bangladesh, Myanmar, Lao PDR, Cambodia, New Zealand and Sri Lanka are not included.

Telecom industry growth > GDP growth
GDP growth > Telecom industry growth



Mobile Subs - Million



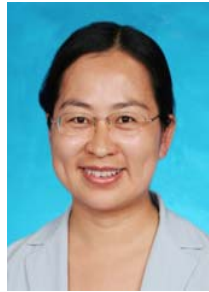


bda

Thanks / Q&A



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