

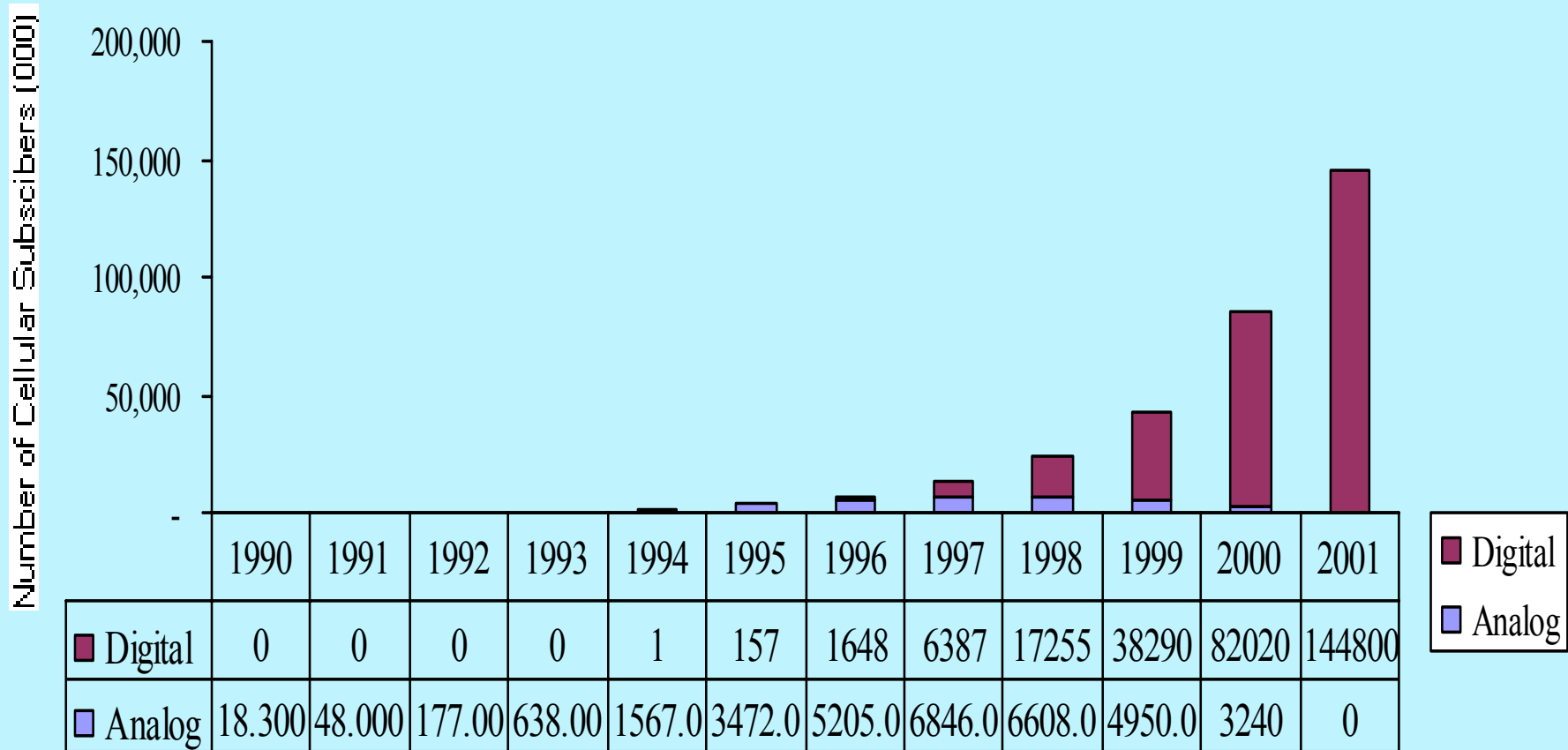
ECONOMIC CONTEXT OF 3G LICENSING IN CHINA



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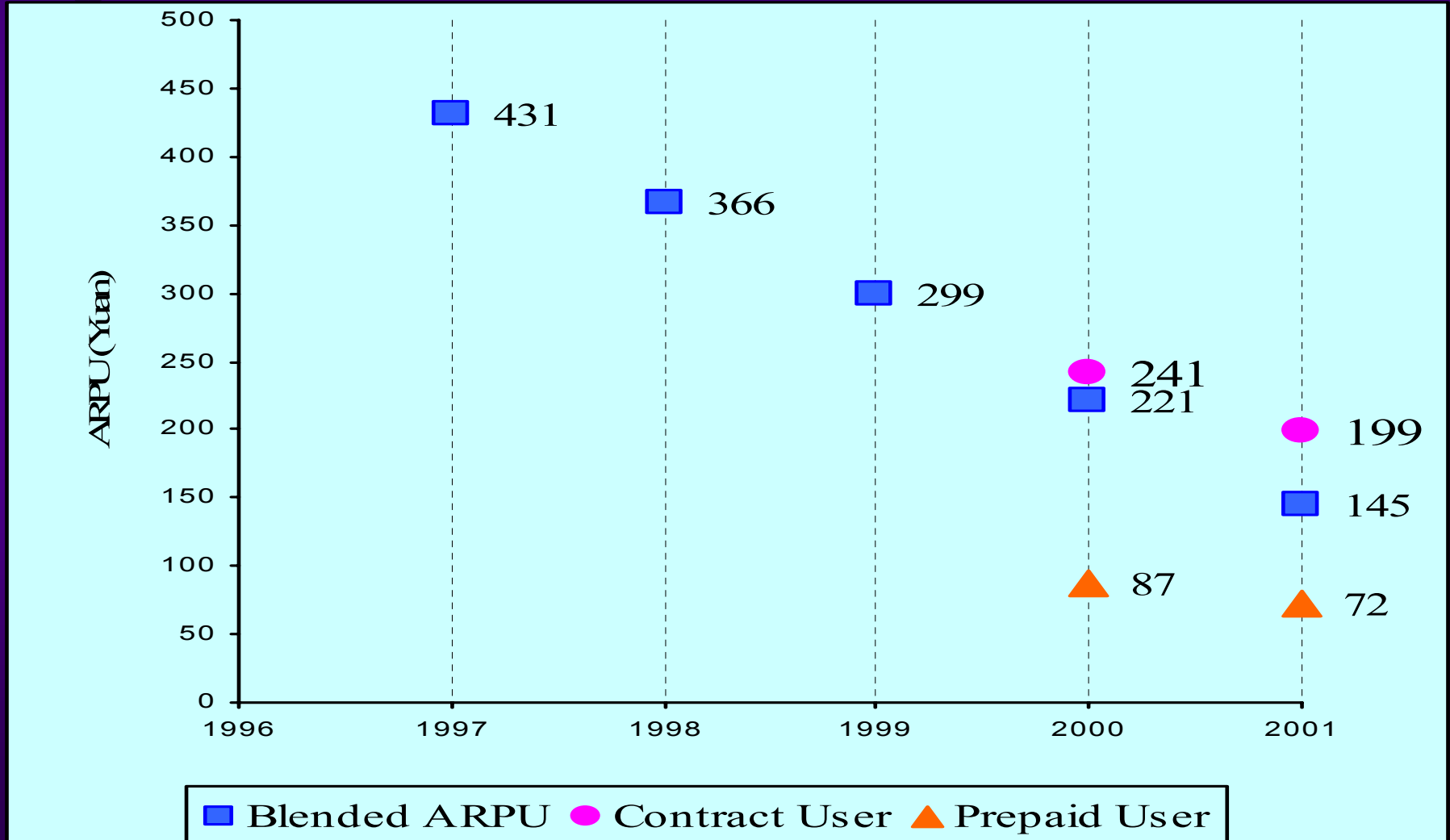
Growth of Mobile Users in China

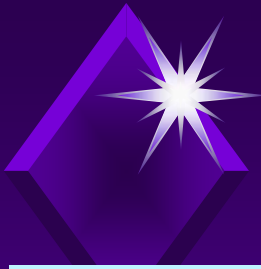


Growth of cellular subscribers in China

(Source: The Ministry of Information Industry)

Subscribers are not Necessarily Users

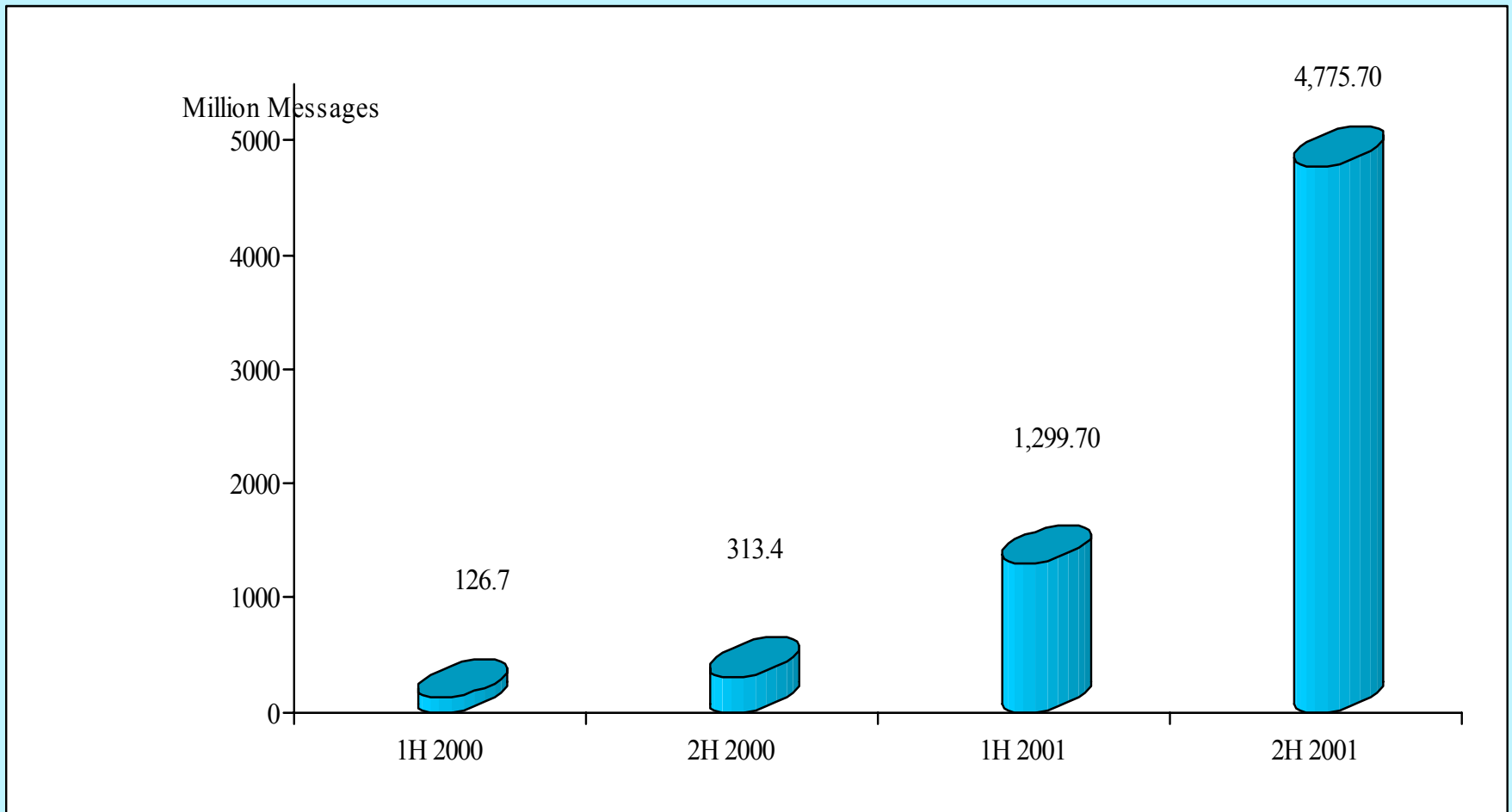




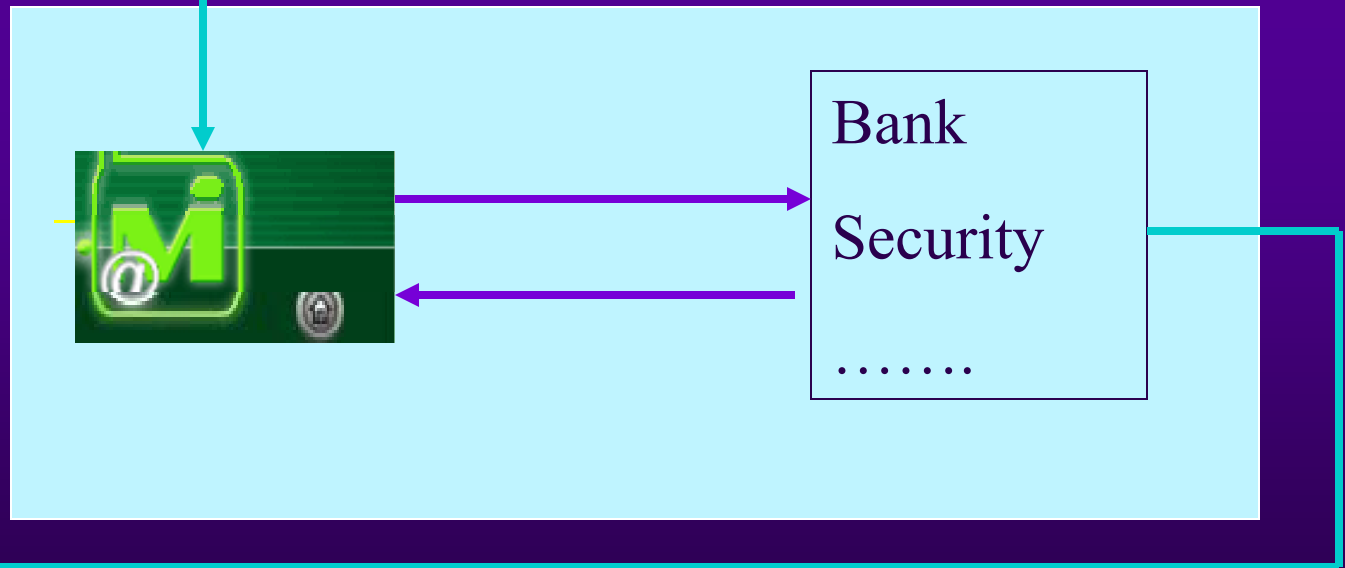
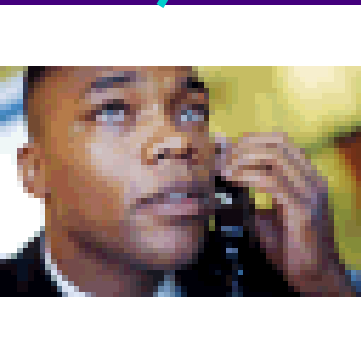
Explosive Growth of SMS

SMS usage volume of China Mobile (HK) in 2001

Source: 2001 China Mobile (HK) Annual Report



Model of B2B Mobile Commerce: The Case of Cyber-on-Air

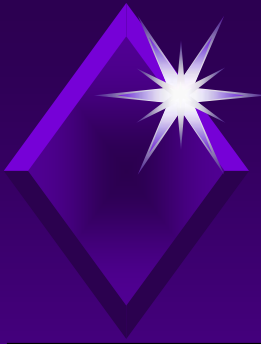




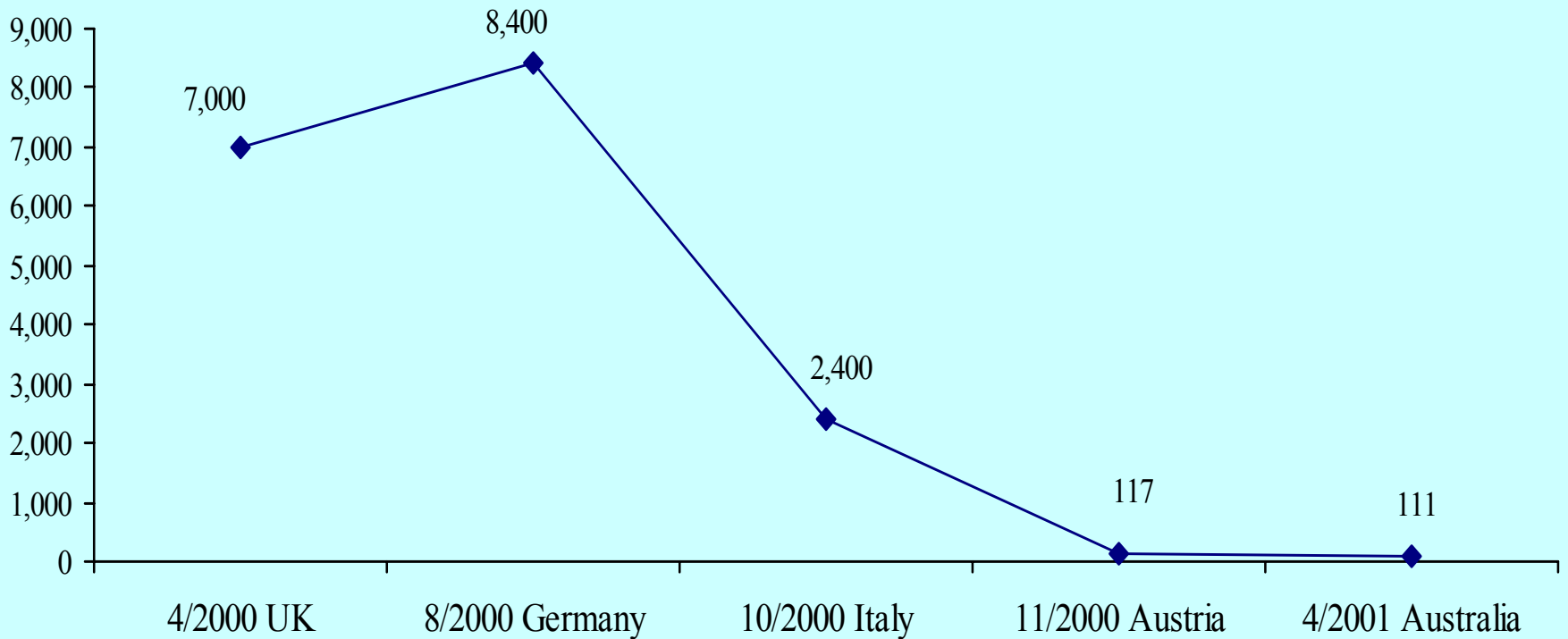
China is Calling for 3G

- Feasibility: SMS shows the demand to mobile data communication is encouraging
- Urgency: The slow speed is currently a bottleneck for the application of mobile data communications





Spectrum Auction is not an Option



Global Trend of 3G Auction Price (Euro, million)



Spectrum Occupation Fee: US\$6.06 Per Subscriber Per Year

Department of Radio Administration,
Ministry of Information Industry





New Initiative on Spectrum Fee

- Operators are asked to pay the spectrum fee directly and spectrum occupation fee will be suspended from 1 July 2002
- Price is defined by regulator in the way of benchmarking
 - 7.5 million Yuan (US\$0.91 million) per MHz in the first year, 11.25 million Yuan (US\$1.36 million) per MHz in the second year, and 15 million Yuan (US\$1.82 million) per MHz in each of the third, fourth and fifth years.



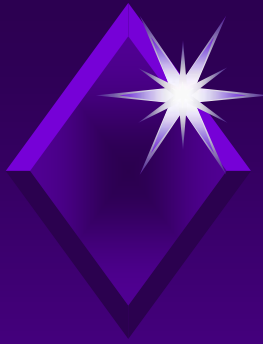
*Key Question in 3G Licensing:
Which Standard to Use?*



CDMA2000

WCDMA

TD-SCDMA



TD-SCDMA: Can a Dream become True?

- What is TD-SCDMA
 - Proposed by Datang
 - One of the three 3G standards of ITU
 - First ITU standard proposed by China
 - Asymmetric transmission
 - Software-defined radio
 - Efficient spectrum usage
 - Smart antenna
 - Smooth migration from 2G to 3G
- Close cooperation with Siemens



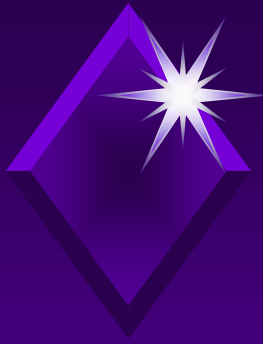
FDI in Telecom Manufacturing

- No digital system before 1982
- Equipment import boom after Fujian installed the first SPC switch of Fujitsu
- Policy of using market in exchange for technology: import, digestion, absorption and creation
- joint ventures were highly encouraged with agreement on technology transference: Shanghai Bell was established in 1984



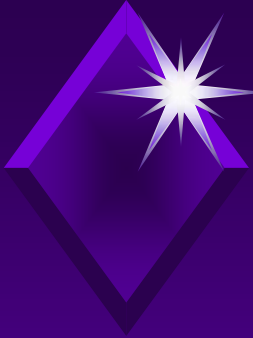
Shanghai Bell: A Successful Case

- In 1998, more than 74% of Shanghai Bell's hardware and 90% of its software products were developed and made in China.
- quotas for domestic market.
- By 1999, its products have been exported to Korea, Vietnam, Philippine, Germany, Spain, Australia, Belgium and other countries with a total revenue of 282 billion Yuan, or US\$34.18 billion.



Government's Support To Domestic Vendors

- assignment of research grant for R&D
- low interest loans
- discounted tax rates
- generous provision of land in high-tech industrial parks
- Operators are encouraged to purchase products of domestic vendors: Supply-demand coordination conference



Ju Da Zhong Hua: Julong, Datang, Zhongxing (ZTE) and Huawei.

- In 1992, the first SPC of 10,000 lines was made in China with China-owned intellectual property rights
- In 1998, 98% of the newly increased switching equipment for fixed local networks and 50% of newly increased optical transmission system.
- In 1999, the market share of local vendors in switching equipment rose to over 99%.
- In 1999, the total revenues from exporting telecommunication equipment and systems reached US\$ 46.6 billion

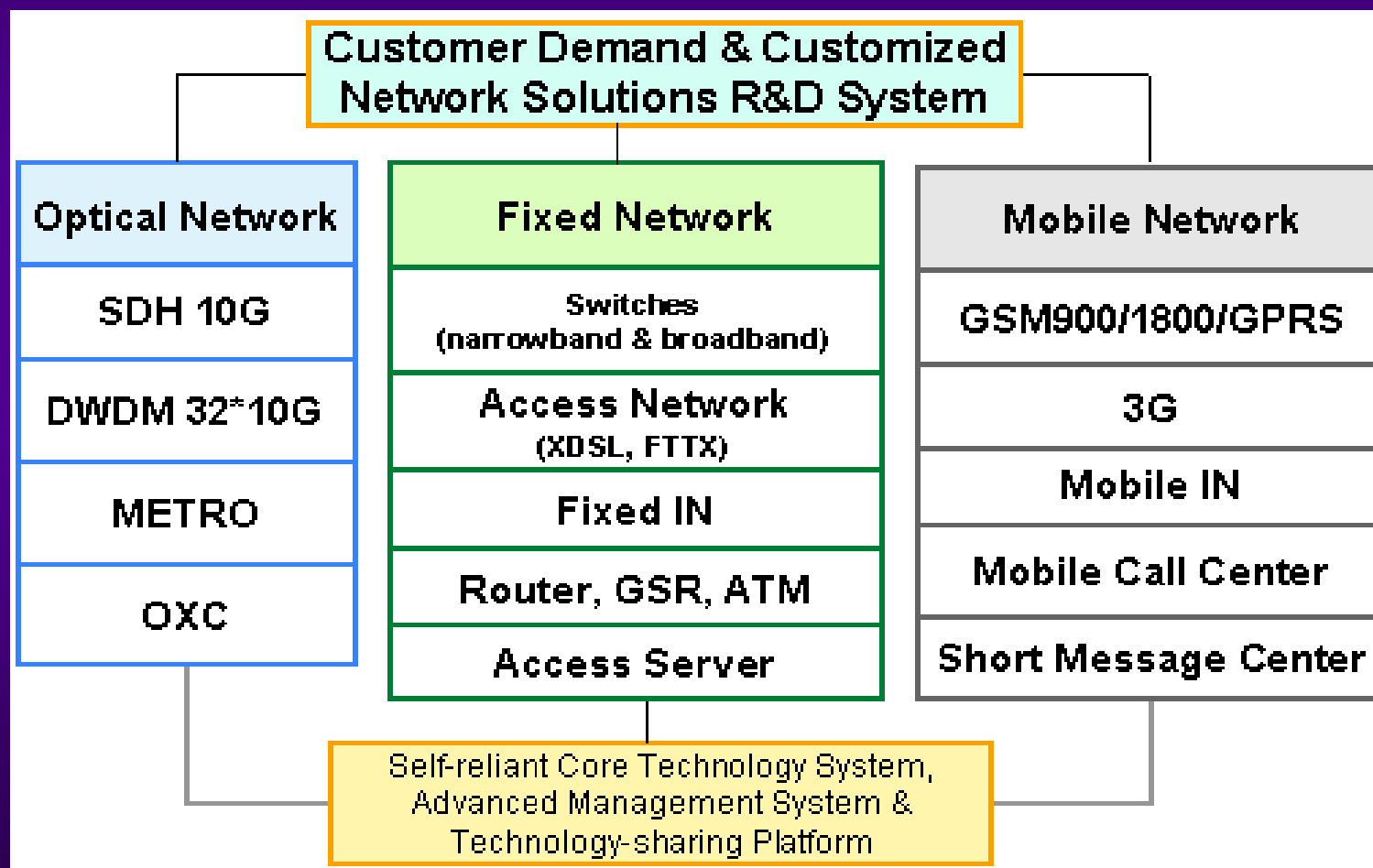


Government Intervention

- *“Government Guideline for Foreign Investment in Telecommunications”*
- Three categories of FDI (1995):
 - Encouraged: Digital Cellular, SDH, ATM switching system, satellite communications system, digital microwave system
 - Restricted: analogue wireless system, PABX, non-ATM central office switches, TV and Radio Broadcasting systems, Fax machines, low speed digital microwave system
 - Forbidden: Telecom operation

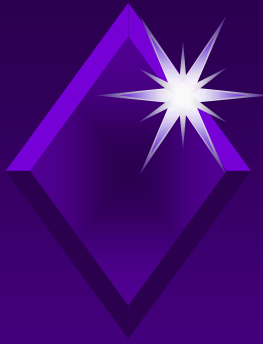


Product Portfolio of Huawei



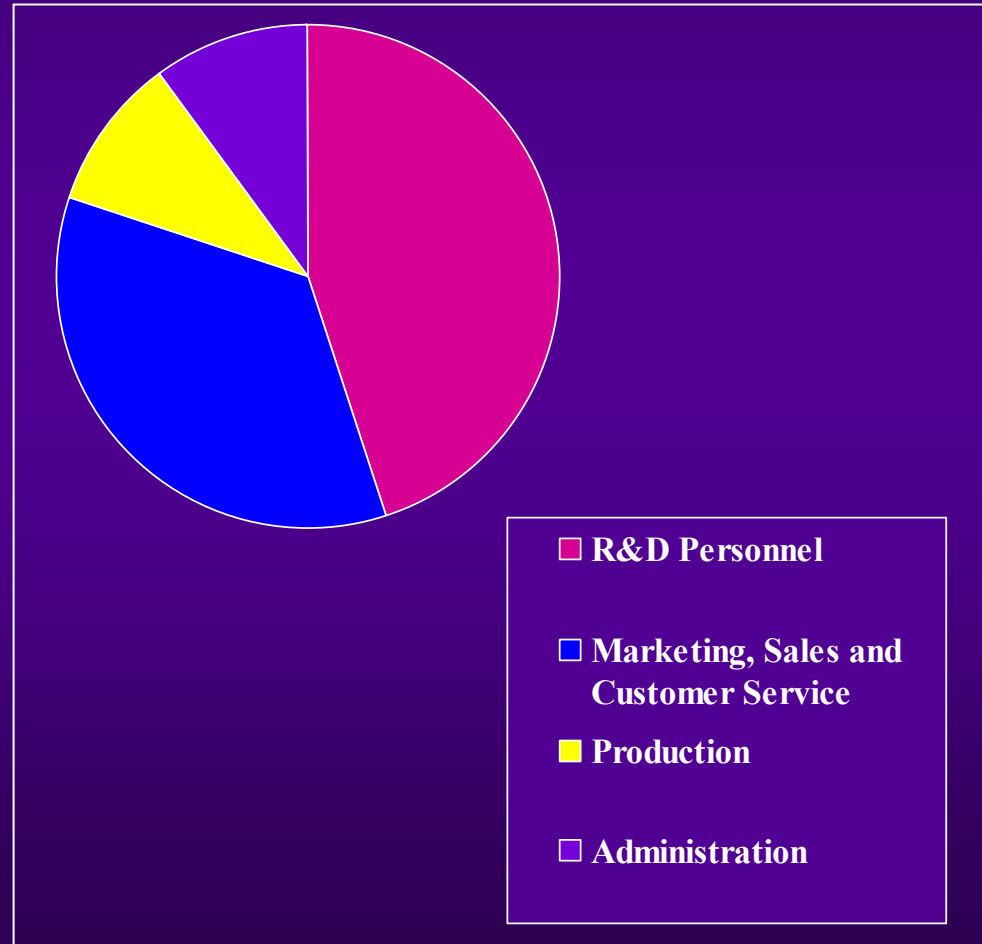
Global Representing Offices and joint Laboratories of Huawei

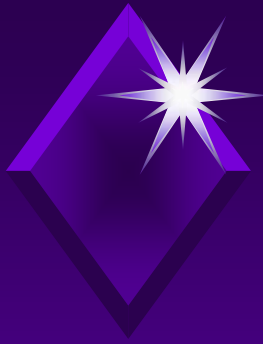




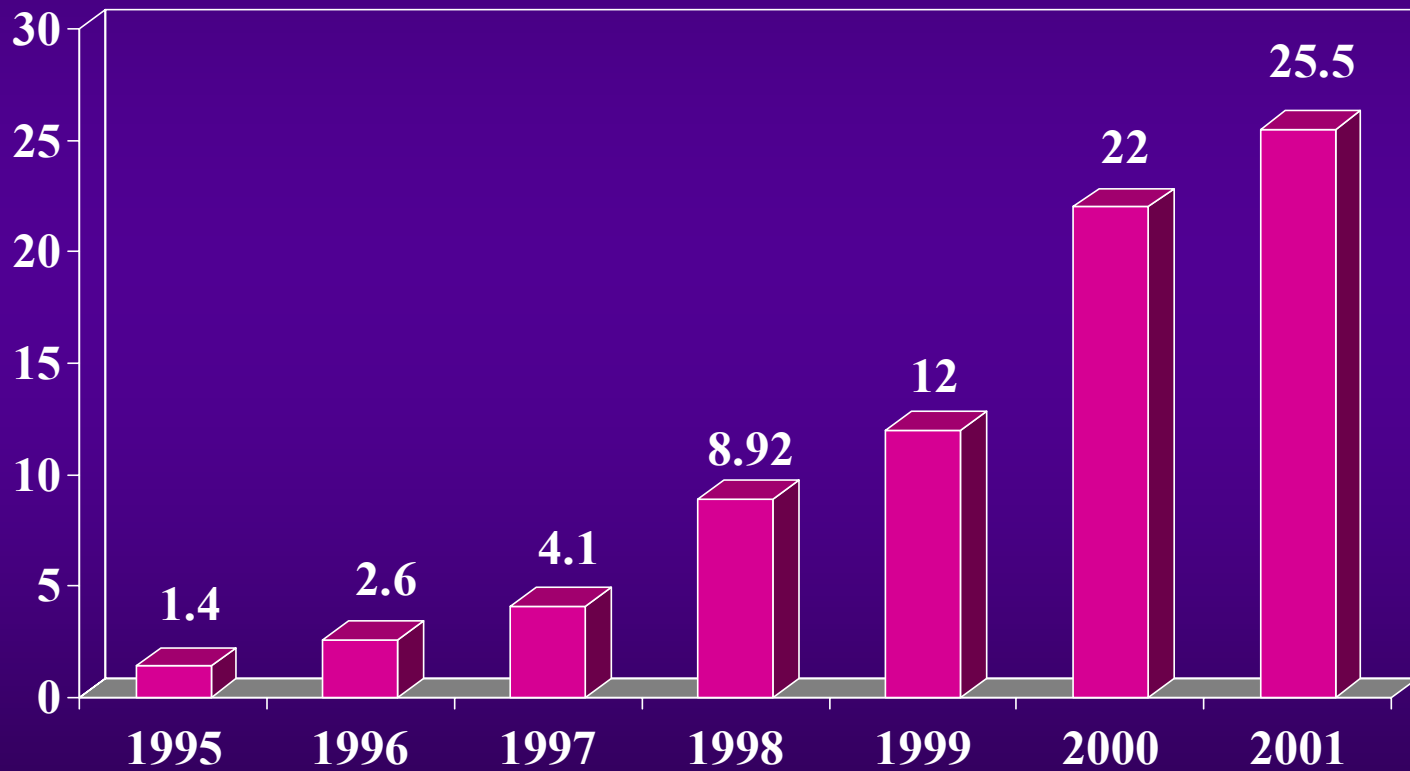
Human and Capital Resource on R&D

- 45% human resource (9000 out of 19000) on R&D
- 85% hold bachelors degree or above
- No less than 10% of annual revenues go to R&D





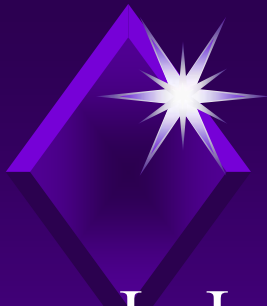
Revenue (Yuan, billion)



Chinese Telecom Manufacturing Industry: market or competitor?

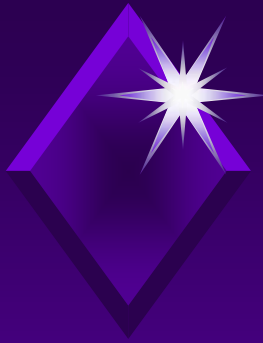
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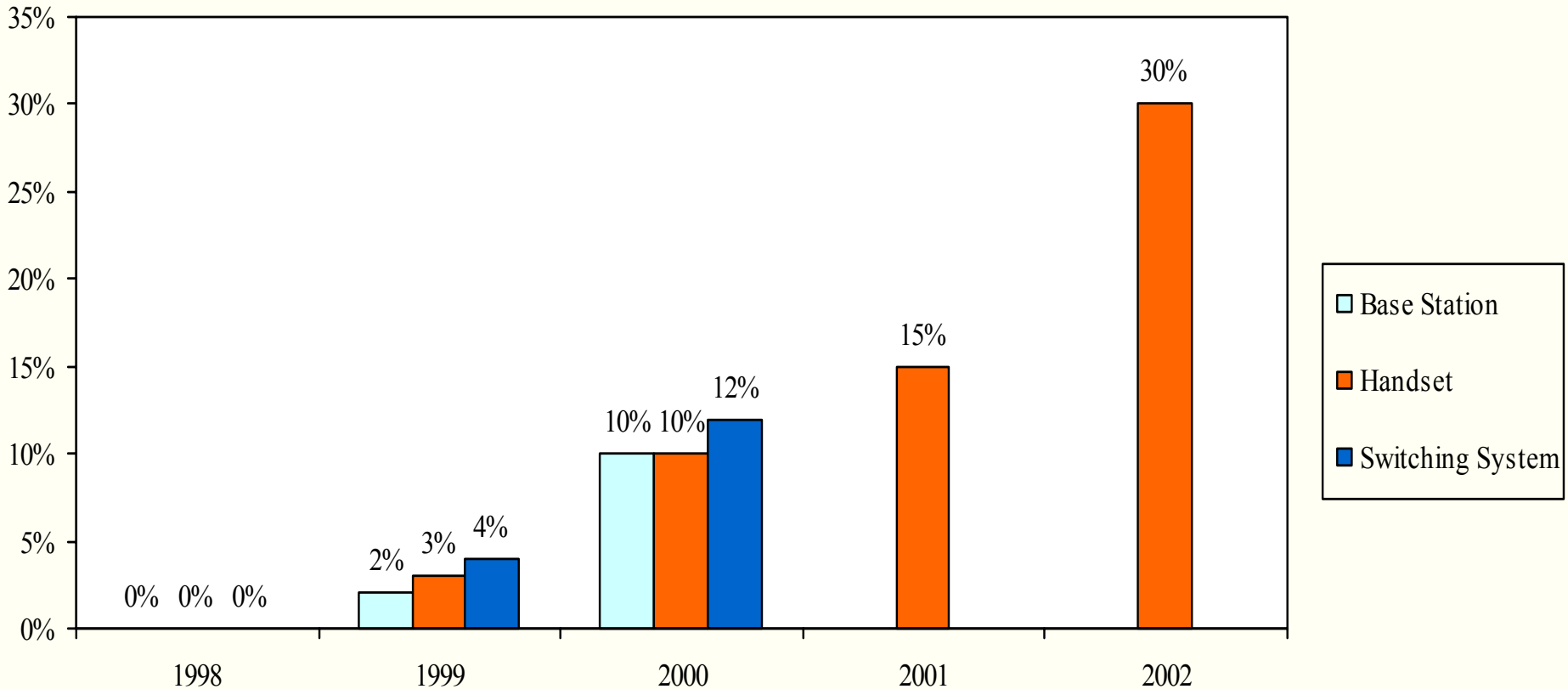
Ambitions in Mobile

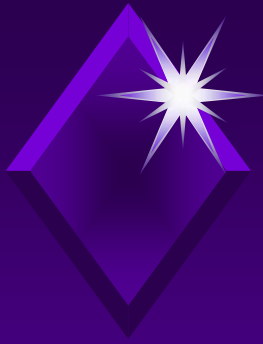
- In January 1999, “Several Issues on Speeding up the Development of Chinese Mobile Communications Industry” by the State Council .
- From 1999 to 2003, 5% of fixed-line telephone connection fee as a special grant for the R&D of mobile technologies.
- In 1999, the MII invested 1.4 billion Yuan (US\$169.70 million) from mobile connection fee to support R&D of mobile technology.
- In addition, the State Planning Commission and the Ministry of Finance raised 570 million Yuan, or US\$ 69 million, to support 31 projects in 7 categories relating to mobile communication technology.



Growth of market share of Chinese domestic vendors in mobile equipment supply

Source: Ministry of Information Industry of China





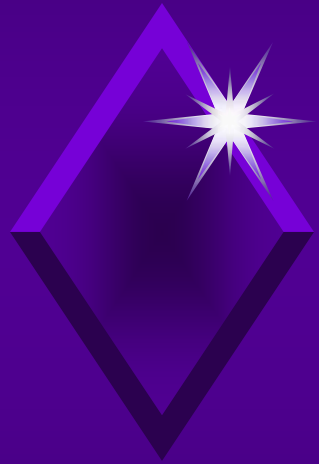
Strategies of Local Handset Manufacturers

- Good after-sale service quality
- Low price
- Target the urban area from country-side
- High class: diamond handset of TCL999D



CDMA: A Short-cut?

- Unicom Horizon: a CDMA network of China Unicom
- ZTE: 7.5% market share.
- Future CDMA2000: avoid the opportunity cost
- Local CDMA handsets: 18 licenses to local vendors (but all have foreign partners) except MOTOROLA



***3G Licensing in China:
Who will be the winner?***



For more details:

- Xu Yan (2001) 3G Licensing Policy in China and Hong Kong SAR: Research Report for ITU, <http://www.itu.int/3g>
- Xu Yan, Douglas Pitt (2002) *Chinese Telecommunications Policy*, Artech House Books: Boston, London

