

Regulation Evolving with Market and Technology

Presentation by

*Mr M H Au, Director-General of Telecommunications, Hong Kong
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Ladies and Gentlemen,

Introduction

I am very pleased to have the opportunity of discussing with fellow regulators around the world on the topic of “regulation evolving with market and technology”.

I shall share with you our recent decision on the equivalent of “unbundling of local loops” in our domestic (local) fixed network market and our current views on the introduction of IP technology for the provision of public telephone services.

First of all, let me give you a brief outline of the telecommunications industry in Hong Kong.

The Hong Kong Telecommunications Industry

In Hong Kong¹, we have adopted a pro-competition pro-consumer policy in the telecommunications sector. The entire telecommunications sector has been open to competition since 1 January 2003. We allow market forces to determine the number of operators unless there are physical constraints, such as the availability of radio spectrum, restricting market entry. We also rely on market forces to determine prices, quality and technology of services in the market and intervene only when the market fails.

There is no foreign ownership restriction in the telecommunications sector. We

¹ Hong Kong is a Special Administrative Region of the People’s Republic of China. Its area is 1,102 square kilometres. Its population is 6.8 million. Its GDP per capita in 2003 was about US\$23,000. It is an international financial and trading centre and the gateway to Mainland China. Services contribute 88% of the overall economy.

Under the “one-country, two-system” principle, telecommunications policy and legislation in Hong Kong are separate from those in the rest of China.

welcome foreign direct investment in our telecommunications industry by entering the market as new operators or acquiring ownership of existing operators.

Development of Competition in the Local Fixed Network Market

The local (domestic) fixed network sector has been progressively open to competition since 1995. From 1 July 1995, three new entrants were licensed to compete with the incumbent. From 1 January 2000, the cable television operator was licensed to provide telecommunications services based on the cable modem technology over its cable television network. Additional operators using wireless technology (Local Multipoint Distribution Systems (LMDS)) were also licensed in 2000. From 1 January 2003, the sector has been fully liberalized. The number of local fixed network licensees is determined by the market only and currently stands at 11.

The local fixed network sector is a sector in which competition is relatively difficult to develop because of the problem for new operators to reach their customers. However, in Hong Kong, we have been able to achieve a degree of success in developing competition in this market. We have at least 5 to 6 active competitors in the market and consumers are getting good deals as a result of competition. To date, the new entrants collectively have acquired 28% of the market in narrowband telephony services and 45% of the market for broadband services. 54% of our households are connected to the Internet by broadband – in fact more than two-third of our households access the Internet via broadband.

The relatively fast development of competition in the local fixed network market can be attributed to a number of regulatory measures that we have taken over the years to foster competition. Apart from lowering regulatory barriers for entry, we have taken steps to enable the new entrants to compete fairly with the incumbent operator.

The initially below-cost tariff for residential telephone line service was re-balanced to cover cost by 2001. This restored the commercial incentive for new entrants to compete in the residential market.

The new entrants have fair access to the numbering resources and there is no difference in length and structure of telephone numbers allocated to the new entrants and the incumbent. Operator number portability has been implemented from day one of market liberalization, lowering substantially the barrier to users for switching between operators.

We understand that to roll out the networks to reach customers, unobstructed access to multi-storey buildings (where most people live and work in Hong Kong) is essential. We have facilitated the construction of self-built customer access networks by granting statutory right of access to the common parts of multi-storey buildings for network rollout. Because of space limitations in buildings, it is likely that not all operators can install their in-building wiring systems. We require open access to the in-building wiring systems installed so that operators without such systems can interconnect to them to reach their customers.

We have coordinated road opening to minimize obstructions to traffic and inconvenience to the public, thereby facilitating the granting of the road opening permits by the highways authority.

We have also helped the new entrants overcome the “last mile” obstruction by implementing what we in Hong Kong call “Type II interconnection” to copper-based customer access networks which is technically equivalent to “unbundling of local loops” in other countries². This policy was introduced in 1995 although large scale use of it only commenced in 1999 after initiation of tariff rebalancing for the residential telephone line services.

Because we are a cosmopolitan city with a high population density, telecommunications infrastructure can be rolled out in a relatively short time and at a relatively low cost per customer to cover a substantial section of the public. For this reason, the new entrants have been able to cover a relatively large proportion of households in a short time. The networks of the new entrants have covered 53% of the households using the technologies of fibre-to-the-building and LMDS.

The coverage of the new entrants’ networks has prompted us to review our Type II interconnection policy. Type II interconnection policy has enhanced competition and consumer benefits in areas where it is either commercially not viable or technically not feasible for new entrants to roll out their self-built customer access networks. However, the policy could undermine investment incentive for rollout to areas where it is commercially viable and technically feasible to roll out self-built customer access networks because Type II interconnection may be viewed as a lower-cost and lower-

² Optical fibres in the customer access networks are not subject to the Type II interconnection requirement in order to preserve commercial incentive for investment in network infrastructure to reach customers’ buildings.

risk approach than self-built customer access networks to serve customers.

In order to encourage the rollout of high-speed high-capacity infrastructure in Hong Kong to meet the future demand of the information society, we have decided in July 2004 to set a target date of 30 June 2008 for the complete withdrawal of Type II interconnection. Before that date, buildings that are connected by at least one self-built customer access network of the new entrants (in addition to the local loop network of the incumbent) will have the Type II interconnection arrangement phased out in three years' time – no new customers can be connected by Type II interconnection after two years (the “transitional period”) while the regulation of the interconnection charge will remain in the third year (the “grandfather period”). After the end of June 2008, Type II interconnection would be based on commercial arrangement³.

Although mandatory Type II interconnection would be phased out by the middle of 2008, we do not expect that consumer choice would be restricted as a result. The advent of new wireless technology⁴ would enable bypass of the local loops of the incumbent to reach customers who are located in buildings which are either technically not feasible or commercially not viable for fibre cables to be laid to them.

IP Telephony

The advent of IP telephony will bring significant challenge and opportunity to fixed network operators in the market. The challenge is that IP telephony could potentially divert substantial revenue from traditional telephone line services. The opportunity is that IP-based technology will enable new revenue streams from innovative multimedia services.

IP telephony of some form has in fact been in existence in Hong Kong for many years, even before the commencement of the liberalization of our external telephone service market⁵.

³ With the exception of locations for which it can be established that the local loops of the incumbent remain as “essential facilities”.

⁴ For example, WiMax

⁵ Computer users had been engaged in computer-to-computer voice applications carried over the Internet. Computer users could also dial to phones connected to the Public Switched Telephone Networks (PSTN) through Internet/PSTN gateways in foreign countries. We did not regard the Internet Service Providers as providing any form of IP telephony services as they were in no position to distinguish between the packets carrying data and voice.

From January 1999, the market for external telephone services in Hong Kong is fully liberalized. Operators can use any technologies for the transmission of voice traffic in and out of Hong Kong. Some have deployed IP technology for such transmission⁶.

IP telephony technology has now been deployed for the provision of local (domestic) telephone services. At first it was deployed within the core and access networks with the interface to customers still based on the conventional circuit-switched format. Then direct IP-based customer interface has been used to provide a form of integrated voice and data services to corporate users. Recently IP telephony service is accessible over broadband connections to residential customers, both broadband connections operated by the operators providing the IP telephony service, and broadband connections operated by other operators.

In considering the appropriate regulation for IP telephony, we shall apply the same pro-competition and pro-consumers approach that has proved to be effective to promote a vibrant telecommunications industry and enhance consumer interest.

Basically, we consider that the choice between the conventional telephone service and the IP telephony service should be left to the consumers. If there is any technical or operational limitation in the IP telephony service, the consumers should be given adequate information in order to make an informed choice. Regulation should not obstruct the introduction of new technologies. We should apply the minimum and proportionate regulation to IP telephony.

In Hong Kong we have been adopting the “technology-neutrality” principle in regulation. That is the service is licensed rather than technology. The operators may deploy any technology to run the service authorized under their licences without seeking approval from the regulator. Like services should be regulated under like conditions.

But then the conditions applied to the conventional telephone service might not be entirely appropriate for IP telephony service. If we should directly apply all the conditions originally designed for conventional telephone service to IP telephony service, then the progress of technology might be impeded.

⁶ The transmission networks include the Internet and managed IP networks, interconnected to the local circuit-switched networks through gateways located in Hong Kong.

Therefore it might be necessary to treat IP telephony as a different class of service and apply a different set of conditions to it. However, if the IP telephony service is to be marketed as a substitute for public telephone service, there may be some minimum conditions that need to be satisfied in order to prevent consumer confusion and safeguard public interest.

What exactly are these minimum conditions are still subject to public consultation. In our preliminary view, some requirements are more obvious than others. For example, an IP telephony service would be expected to provide any-to-any connectivity, meaning that it can be used to make a call to, and to receive call from, any subscribers connected to the PSTN for conventional telephone service. The ability for the IP telephone service to call the emergency services would seem to be an essential requirement if the service is to be marketed as a substitute for the conventional telephone service. As users of the conventional telephone service are already used to the privacy protection afforded by calling line identifications, probably they would expect calling line identifications to be provided for calls to and from the IP telephony service.

Many users would accept that the IP telephony service needs not meet certain requirements. For example, the IP telephone service needs a modem on customer's premises. Users would be expected to be aware of the potential interruption of service in case of a power outage on the customer's premises, similar to the situation when they use a cordless telephone on their premises. With the availability of mobile phones as backup, the interruption may not be a serious problem.

Other requirements may be in the grey areas. It would be preferable for the IP telephony service to have the same telephone number length as conventional telephone services, but would the users of the IP telephony service mind a longer telephone number in exchange for, for example, lower prices? Would the users of the IP telephony service expect number portability as for the conventional telephone service, if the IP telephony line is just a secondary (or backup) line? Would the users of the IP telephony service expect the inclusion of directory enquiry services as part of the service already paid for, as for conventional telephone service? Finally would the users of IP telephony service tolerate a lesser standard of quality of service, in terms of intelligibility, grade of service and reliability, if the quality is no worse than that of mobile phone services?

Some requirements are critical to government agencies that have been relying on

certain capabilities available on the conventional telephone service. For example, the emergency service may rely on the calling line identification of the callers to identify the locations of the callers. The telephone numbers of IP telephony service may have no correlation with the location of the caller. How exactly such problems should be resolved still needs to be discussed with the industry and the government agencies concerned.

We intend to gauge the opinion of the industry and the public on the appropriate conditions to be met by IP telephony by conducting a consultation exercise later this year.

The introduction of IP telephony technology and the migration to IP-based networks, sometimes called Next Generation Networks (NGN), can be disruptive to the business plans of local fixed network operators.

IP telephony can divert revenue from the local fixed network operators. First telephone lines of the conventional telephone service may be substituted by the IP telephony service accessed over broadband connections. In Hong Kong, this potential substitution could be a significant challenge to existing local fixed network operators because of the high household penetration of broadband connections.

Second, revenue from international call charges, termination charges, origination charges and local access charges based on circuit-switched technology would be lost when the traffic bypasses the circuit-switched networks altogether.

Third, IP telephony would increase the cost to meet universal service obligations. In Hong Kong, the incumbent operator has the universal service obligation to provide basic telephone service to all irrespective of location and cost⁷. The introduction of IP telephony would potentially increase universal service cost as revenue from telephone lines will be reduced or diverted and the costs of operating the lines are higher as a result of fewer lines. The number of external traffic minutes sharing the universal service cost would be less as more traffic is migrated to IP-based networks.

Traditionally, telephone services in Hong Kong are provided by the network operators supplying the lines to the customers. As we do not have call charges for local

⁷ The cost of meeting this obligation is the sum of the “loss” made in serving the “uneconomic” customers for whom the cost of serving them exceeds the corresponding revenue. The universal service cost is calculated by the regulator on an annual basis and is shared by all external telephone service operators in proportion to the volume of traffic in that year.

telephone services, we have no carrier pre-selection for such services. However we do have indirect access to international telephone services, meaning that customers connected to a telephone line can have access to international telephone services of other operators.

With the introduction of IP telephony, even the local telephone service can be provided by a network operator or service provider separate from the network operator supplying the broadband connection. Hong Kong network operators have recently launched IP telephony services which can be accessed through broadband connections supplied by other network operators.

Service providers who do not invest in transmission facilities, like for example, Internet service providers, also wish to provide local voice telephony service using IP technology. However, up to the present, only facilities-based operators, or network operators, are entitled to get numbering blocks for assignment of telephone numbers to customers. Service-based operators have asked for the same privilege of access to numbering blocks. Without the telephone numbers, customers to the IP telephony service of service-based operators cannot receive incoming calls.

Understandably network operators felt the challenge from the potential diversion of revenue by the entry of service-based operators into the market. The network operators would argue that they need such revenue to recoup their investment in the network infrastructure and generate the necessary cashflow for continued investment.

But IP technology is bound to cause drastic changes to the operating environment. In the future NGN operating environment, customers with broadband connections provided by the network operators can then gain access to content, applications and services provided by others over a plethora of interconnected networks and platforms. In fact, it is perfectly feasible for a customer in Hong Kong to have access to a service provided by a service provider located outside Hong Kong⁸. Therefore the broadband connection merely provides the access to the interconnected networks and platforms. The supplier of the connection cannot expect exclusive provision of content, applications and services to the customer.

Some network operators might look to the regulator to adopt regulatory measures to manage the transition to the future operating environment of the NGN so as to preserve the incentive and ability of the local fixed network operators to invest in the

⁸ The only restriction is then the customer probably receives a telephone number of the foreign country.

infrastructure.

We fully appreciate the need to maintain an environment conducive to investment in network infrastructure. To counter the diversion of revenue from conventional circuit-switched services, the network operators should identify new business models to enhance their revenue from IP-based conveyance services. For example, in addition to the “best effort” conveyance services, they could provide differentiated services with service level guarantees for which they would be entitled to extra payments from the service providers or end-users. The network operators themselves would be providers of content, applications and services to customers and derive revenue from innovative services enabled by the NGN technology. They could deliver content, applications and services of higher added-value to the customers to offset declining revenue from conventional services.

In my view, the regulator should not introduce barriers that are aimed to slow down the entry of IP-based services. In any case, the regulator is unable to do so. The Internet has been operating as an “open network” and users can gain access to any content, application or service on the Internet. The regulator should continue to foster “open network” and fair competition between the facilities-based operators and service-based operators in the NGN environment. The pace of the transition to IP-based services should be decided by the market.

Conclusion

To conclude, regulatory policy is not something static. We have to keep track of the market and technological developments and ensure that our regulation remains updated and relevant to our policy objectives. In Hong Kong, we have addressed market development in the local fixed network sector by deciding to withdraw mandatory Type II interconnection by a target date four years from now. The introduction of IP telephony may require a fundamental review of our existing regulation to ensure that it is still relevant and proportionate. We shall be conducting an industry consultation on IP telephony later this year. We shall also be learning from other regulators on how they address these issues. I look forward to a useful exchange of views in the discussions in this panel.

Thank you.

6 September 2004