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Panel on Information Technology and Broadcasting

Meeting on 12 November 2007

**Background brief on the progress in the implementation of
digital terrestrial television broadcasting in Hong Kong**

Purpose

This paper gives an overview of the development of digital terrestrial television (DTT) broadcasting in Hong Kong, and summarizes the measures taken by overseas countries in implementing DTT broadcasting. The paper also sets out the concerns raised by members of the Panel on Information Technology and Broadcasting (the Panel) regarding the implementation of DTT in Hong Kong. .

Introduction

2. DTT broadcasting is a new technology of transmitting television (TV) services, in which pictures and sound are processed electronically and converted into digital format for transmission. The signals will be re-converted by appropriate devices, such as set-top boxes, into TV programmes. DTT broadcasting, as compared with analogue broadcasting, brings major benefits in enhancing efficiency in utilizing radio spectrum, resolves some reception problems, and offers opportunities of new services including multi-channel broadcasting, standard definition TV (SDTV)¹, high

¹ A picture on the television screen is formed by a large number of small dots called pixels. The higher the number of pixels, the better the resolution hence picture quality. Conventional analogue TV broadcasting provides a resolution of up to 720 (horizontal) × 576 (vertical) pixels, which is known as 576 lines.

Standard definition television (SDTV) broadcasting can be considered as the digitized version of the conventional analogue television broadcasting. However, SDTV pictures are free from reception problems including "ghosting" and "snowing", and thus have a picture quality similar to digital versatile disk (DVD) (typically having a resolution of 525 lines).

High definition television (HDTV) broadcasting, on the other hand, provides a high picture resolution of at least 720 lines or up to 1080 lines and typically on a wide screen (with an aspect ratio, i.e., the ratio of picture width to height, of 16:9). Hence, HDTV provides a much better picture quality than analogue television and SDTV broadcasting and enables viewers at home to have the same experience as watching movies in a cinema.

definition TV (HDTV)¹, broadcasting with multi-viewing angles, interactive services, datacasting (e.g., financial quotes), etc. Digital TV services are already available to viewers in Hong Kong via cable, satellite and broadband networks. Terrestrial TV, which is the most pervasive kind of TV service in Hong Kong, has yet to be digitized.

Latest development of DTT implementation in overseas countries

3. Most advanced economies such as the United States (US), Canada, the United Kingdom (UK), Germany and Australia, etc. have already launched DTT broadcasting, and some have also set a deadline for switching off analogue TV broadcasting.

4. In 1996, the US Congress authorized the distribution of an additional broadcast channel to each broadcast TV station so that they could start a digital broadcast channel while simultaneously continuing their analogue broadcast channels. Later, the Congress mandated that 17 February 2009 would be the last day for full-power TV stations to broadcast in analogue. To help consumers with the digital TV transition, the US government has established the Digital-to-Analogue Converter Box Coupon Programme under which, between 1 January 2008 and 31 March 2009, all US households will be eligible to receive up to two coupons, worth US\$40 each, to be used for the purchase of up to two digital-to-analogue converter boxes.²

5. In June 2002, Canada adopted a voluntary, market-driven transition model for launching DTT broadcasting, without mandating switch-over deadlines.³

6. The UK government announced in September 1999 that the switch to digital would be subject to ensuring that everyone who currently receives public service channels in analogue form can receive them through digital means and the switch to digital is an affordable option for the vast majority of people.⁴ The British Broadcasting Corporation (BBC), the major broadcaster in UK, is at the forefront of making the switch from analogue to digital TV by 2012. It will help inform the public of the switch and provide "practical help" for those aged over 75 and with severe disabilities by providing the necessary equipment and assistance for free to the poorest households and for a "modest

² Federal Communications Commission. (2007) Available from : <http://www.dtv.gov/consumercorner.html> [Accessed November 2007]

³ Canadian Radio-television and Telecommunications Commission. (2002) *Broadcasting Public Notice CRTC 2002-31*. Available from : <http://www.crtc.gc.ca/archive/ENG/Notices/2002/pb2002-31.htm>

⁴ UK Government (2005) *A Guide to Digital TV and Digital Switchover*. Available from : http://www.digitaltelevision.gov.uk/pdf_documents/publications/guide_dtvswitchover_june05.pdf [Accessed November 2007]

fee" to others.⁵

7. In the case of Germany, in November 2002, DTT was first implemented in the Berlin-Brandenburg region where all analogue signals were switched off in August 2003. Subsidies to low-income households and an extensive consumer programme were some of the measures undertaken to facilitate digital uptake. According to the plan of the federal government, the entire country will switch to digital TV in 2010.⁶

8. In March 1998, the Australian government announced the mandated introduction of DTT broadcasting in metropolitan areas from 1 January 2001 and in all regional areas by 1 January 2004. Under the policy framework, existing broadcasters are obliged to continue their analogue broadcasting for at least eight years after the start date for digital services in their licence/coverage areas.⁶ While recognizing that some Australians may find it difficult to make the switch to digital due to either personal circumstances or geographic location, the Australian government has undertaken to ensure that wherever possible, disadvantaged persons are supported in the switch to digital TV closer to complete switchover.⁷

Consultations with the public and the Mainland

9. The Panel was first briefed on the Administration's preliminary proposals on DTT in the context of the consultation on the 1998 Review of Television Policy, which was conducted to, inter alia, examine the applications of digital technology in local TV services, as well as the transformation it would bring to commercial TV, especially with regard to the development of HDTV, etc.

10. In December 2000, the Administration initiated a three-month public consultation on the policy and regulatory proposals for DTT broadcasting in Hong Kong (the first consultation). The scope of the consultation covered the choice of DTT technical standard, the frequency plan, the licensing approach, the arrangements for transition from analogue to DTT broadcasting, the setting of an analogue switch-off date, and the requirements of set-top boxes.

⁵ BBC. (2006) *News Release: At a glance: BBC White Paper (14 March 2006)*. Available from : <http://news.bbc.co.uk/2/hi/entertainment/4806728.stm> [Accessed November 2007].

⁶ ITB Panel. (October 2006) *Report on the Study of Public Service Broadcasting for Hong Kong*

⁷ Department of Communications, Information Technology and the Arts, Australian Government. *Ready, Get Set, Go Digital - A Digital Action Plan for Australia*. Available from : http://www.dcita.gov.au/_data/assets/pdf_file/53496/Digital_Action_Plan_web.pdf [Accessed November 2007]

11. Having regard to the views received and the outcome of its co-ordination with Mainland authorities regarding the frequency plan for DTT broadcasting and overseas developments in digital broadcasting, the Administration issued a second consultation paper in December 2003 for a three-month consultation (the second consultation). In particular, public views were sought on the proposed market-led approach to the selection of DTT technical standard for Hong Kong, the allocation of multiplexes⁸ and the licensing arrangements.

12. Throughout the two rounds of consultations, the incumbent domestic free TV programme service licensees (namely, Asia Television Limited (ATV) and Television Broadcasts Limited (TVB)), urged that a decision on the technical standard to be adopted for DTT should not be made until the Mainland had announced the national standard. ATV and TVB considered that if the same technical standard was adopted by the Mainland and Hong Kong, the wider multi-media market would be more attractive to investors of DTT and more business opportunities would be opened up for Hong Kong.

13. On 9 July 2004, the then Secretary for Commerce, Industry and Technology announced the implementation framework for DTT broadcasting. In gist, ATV and TVB are required to launch DTT by 2007 and expand the digital coverage to at least 75% of Hong Kong by 2008. The two broadcasters are required to simulcast their four existing analogue programme channels in digital format by sharing a newly assigned multiplex, and they are each assigned one additional multiplex for launching new services such as multiple SDTV channels, HDTV and interactive services, etc.

Implementation of DTT broadcasting

Overall planning and service rollout

14. The implementation of DTT broadcasting in Hong Kong can be broadly divided into the following three phases:

Phase 1 (2004 – 2008)	Realization of DTT
Phase 2 (2009 – 2011)	Switchover to DTT
Phase 3 (2012 and beyond)	Analogue switch-off

15. In December 2005, the Telecommunications Authority (TA) and Broadcasting Authority (BA) respectively approved ATV and TVB's plans for rolling out their DTT network and services with a view to providing a digital coverage comparable to the existing analogue one by 2011, and meeting the target of analogue switch-off by 2012. To achieve this, ATV and TVB are

⁸ A multiplex is a digital transmission frequency channel which combines TV programme materials and other data in digital form for transmission via a frequency channel. The process of digital combination of the signals is called multiplexing.

building their transmission network in stages and will first construct a total of six main transmission stations to cover at least 75% of Hong Kong. The first main station, the Temple Hill principal transmission station, which can serve up to 50% of Hong Kong in the south of Kowloon and north of the Hong Kong Island, will be ready by the fourth quarter of 2007. The construction of the remaining five main stations in other areas to cover another 25% of Hong Kong will be completed by 2008.

Choice of DTT transmission, compression and reception standards

16. In August 2006, the Mainland authorities announced the national standard for all Mainland terrestrial TV stations which broadcast in digital format with effect from 1 August 2007. ATV and TVB conducted comprehensive tests of the standard and have confirmed that the national standard meets their technical requirements and is suitable for application in Hong Kong. In end 2006, they formally submitted their proposals to the TA that Hong Kong should adopt the national standard for DTT transmission.

17. Based on ATV and TVB's proposed technical standards on transmission, compression and coding as well as their committed service rollout plans, the Administration envisages that there would likely be two different tiers of set-top boxes available in the market to coincide with the launch of DTT:

- (a) **Basic tier** set-top boxes capable of decoding and receiving only SDTV programmes coded in MPEG-2 format, i.e., the four programme channels simulcast by ATV and TVB; and
- (b) **Higher tier** set-top boxes capable of decoding and receiving both SDTV and HDTV programmes coded in either MPEG-2 or H.264⁹ formats. Such boxes receive all services received by the basic tier set-top boxes, as well as all other SDTV or HDTV programmes to be provided by ATV and TVB.

18. On 4 June 2007, TA announced the adoption of the national standard for DTT transmission. With regard to DTT compression and coding, the TA considers that MPEG-2 should be adopted for simulcast via the shared multiplex, whereas the two broadcasters would be allowed to choose between MPEG-2 or H.264 for new services via the two additional multiplexes. Having adopted the technical standards for compression, coding and transmission, the TA will decide on, in the light of feedback from ATV and TVB and consumer electronic manufacturers, a set of technical specifications for DTT receivers (including set-top boxes and integrated TV sets¹⁰).

⁹ H.264 is a more advanced version of compression and coding standard, which is more spectrum efficient and would allow spare spectrum capacity for other new services such as mobile TV and interactive services.

¹⁰ Integrated TV sets would require more time for development than set-top boxes, and would most

Working groups to facilitate DTT implementation

19. Two working groups have been set up by the Office of the Telecommunications Authority (OFTA) with ATV and TVB. One is to resolve technical problems and facilitate inter-departmental co-ordination with respect to arrangement for land lease, planning application and site construction, etc, so as to ensure timely network rollout. Another working group is to handle all technical issues related to DTT reception and receiving equipment. In particular, ATV, TVB and OFTA will work out standards for compliance by electronics manufacturers/suppliers/importers and operators of in-building communal antenna broadcast distribution (CABD) systems. OFTA will also issue guidelines to facilitate the replacement of antennae, as well as upgrading/installation of CABD systems by building management, etc. This working group will also explore the feasibility of a labelling scheme for DTT consumer products.

Enhancement of public awareness of and interest in DTT

20. To disseminate information about DTT to the public and encourage DTT take-up, a comprehensive promotion and publicity strategy will be adopted. At the initial stage in 2007 and early 2008, the main objective of the Government's promotion campaign would be to raise public awareness of DTT with a focus on informing early adopting viewers about requirements for and availability of receiver products to enable them to make informed purchase choice. The channels of publicity and promotion include a dedicated website (www.digitaltv.gov.hk), announcements of public interest on TV and radio and information leaflets to building management companies, owners' corporation as well as households.

Members' concerns

21. The Panel has followed up closely issues related to the implementation of DTT broadcasting, and discussed the subject and received views from deputations, including the two domestic free TV programmes licensees, at a number of meetings since 1998. Members' latest concerns over the subject as expressed at the meeting on 11 June 2007 are summarized in the ensuing paragraphs.

probably focus on decoding and displaying, similar to higher tier set-top boxes, both HDTV and SDTV pictures provided by the two broadcasters.

DTT reception and take-up

22. Members are keen to ensure the readiness and competitiveness of prices of DTT receiver products, such as set-top boxes and integrated TV sets, etc. The Administration has advised that subject to the TA's finalization of the technical specifications for DTT receivers, receiver products are likely to become readily available at different price levels depending on their features and functions. The basic tier set-top boxes for SDTV-only reception are expected to be available within three months for around a few hundred dollars, while higher tier receivers for both SDTV and HDTV reception are expected to be available within six months, at a higher price at the initial stage. Integrated TV sets will require a longer production lead-time and are expected to come on to the market by mid 2008.

23. Noting that there are two different tiers of set-top boxes, members are concerned that those households that cannot afford the higher-end set-top boxes (i.e. higher tier set-top boxes) will have less programme choice and be deprived from viewing HDTV programmes in future. The Administration has clarified that the choice of a suitable set-top box depends on the type of TV set currently in use by the viewers. The basic tier set-top box will be more suitable for the conventional cathode ray tube TV sets which, once connected with a basic tier set-top box, will provide good reception for the four programme channels simulcast by TVB and ATV. A higher tier set-top box will not help these older types of TV sets to receive the higher picture quality of HDTV programmes.

24. Since not every household can afford to buy set-top boxes or expensive TV sets for viewing HDTV programmes, those households who cannot not afford to purchase DTT receivers for reception of DTT programmes will therefore be deprived of free television programme services if analogue broadcasting is to be switched off in 2012. As such, members consider that the Administration should set up some objective criteria for the analogue switch-off. In this regard, they suggest that instead of sticking to a deadline for complete analogue switch-off, the Government can, for example, consider using the DTT uptake, i.e., the proportion of population/households that has taken up DTT, in order to determine when to switch off analogue broadcasting. According to the Administration, overseas experience shows that as far as practicable, a target date for analogue switch-off should be set to encourage early DTT take-up so that the spare spectrum thus released will be usefully deployed for other new services and economic activities such as mobile TV and interactive services. The Administration also stresses that 2012 is only a target date. Nevertheless, the Administration takes on board members' suggestion to make a decision on the timing of the analogue switch-off with due regard to the world trend, and on the basis of objective criteria and statistics including the extent of DTT coverage, consumers' DTT readiness as well as the degree of public acceptance as indicated by the extent of DTT uptake. In this regard, members have requested the Administration to provide in due course an estimate on the economic benefits arising from the analogue switch-off for members' reference. Moreover, to help migrate to DTT

services, members have also urged the Administration to seriously consider providing assistance as appropriate to needy families to facilitate an early complete digital switch-over.

Environmental concern about discarding existing analogue TV sets

25. While more than one million households in Hong Kong have TV sets, members have expressed concern that the disposal of discarded TV sets and outdated models of set-top boxes will add pressure to the existing landfill in Hong Kong. They have urged the Administration to consider ways to reduce electronic waste. While stressing that existing TV sets once connected with set-top boxes with digital decoders will be capable of receiving DTT broadcast and hence need not be disposed of, the Administration assures members that the Environmental Protection Department will be involved in the DTT migration exercise to help address concerns about environmental impacts and related issues.

Publicity and promotion drive

26. Members consider that consumer education is essential to assist the general public in making informed decisions as to when and what type of receiver products will best suit their need of DTT viewing. To disseminate information about the DTT implementation and to encourage DTT take-up, the Administration has undertaken to coordinate publicity efforts with the Consumer Council, ATV and TVB to launch a comprehensive promotion and publicity programme nearer the time of the DTT launch to raise public awareness and to provide the public with consumer information about requirements for and availability of receiver products to enable consumers to make informed purchase choice.

Latest position

27. The Administration will brief the Panel on the latest position in the implementation on DTT broadcasting in Hong Kong at the meeting to be held on 12 November 2007.

Relevant papers

28. A list of relevant papers is at **Appendix**.

List of relevant papers

Committee	Paper	LC Paper No.
Meeting of Panel on Information Technology and Broadcasting (ITB) on 5 December 2003	<ul style="list-style-type: none"> ✧ Administration's paper : "Second Consultation on Digital Terrestrial Broadcasting in Hong Kong " ✧ Background brief on digital terrestrial broadcasting ✧ Minutes of meeting 	<p>CB(1)470/03-04(07)</p> <p>CB(1)460/03-04</p> <p>CB(1)712/03-04</p>
Meeting of ITB Panel on 8 March 2004	<ul style="list-style-type: none"> ✧ Submissions from deputations/ individual ✧ Background brief on digital terrestrial broadcasting and related issues ✧ Minutes of meeting 	<p>(please refer to the agenda)</p> <p>CB(1)1166/03-04</p> <p>CB(1)1661/03-04</p>
Meeting of ITB Panel on 18 July 2006	<ul style="list-style-type: none"> ✧ Administration's paper : "Progress of the implementation of digital terrestrial television broadcasting in Hong Kong" ✧ Submission from deputations ✧ Minutes of meeting 	<p>CB(1)1950/05-06(01)</p> <p>(please refer to the agenda)</p> <p>CB(1)178/06-07</p>
ITB Panel	<ul style="list-style-type: none"> ✧ Report on the Study of Public Service Broadcasting for Hong Kong 	<p>http://www.legco.gov.hk/yr05-06/english/panels/itb/papers/itb-rpt061009-e.pdf</p>
Meeting of ITB Panel on 6 February 2007	<ul style="list-style-type: none"> ✧ Administration's paper : "Consultation on Digital Broadcasting: Mobile TV and Related Issues" ✧ Minutes of meeting 	<p>CB(1)853/06-07(05)</p> <p>CB(1)1297/06-07</p>
Meeting of ITB Panel on 11 June 2007	<ul style="list-style-type: none"> ✧ Administration's paper : "Implementation of Digital Terrestrial Television" ✧ Submission from deputations ✧ Minutes of meeting 	<p>CTB(CR)9/19 (07) Pt. 24</p> <p>(please refer to the agenda)</p> <p>CB(1)2308/06-07</p>