

LEGISLATIVE COUNCIL BRIEF

DIGITAL AUDIO BROADCASTING

INTRODUCTION

At the meeting of the Executive Council held on 15 December 2009, the Council ADVISED and the Chief Executive ORDERED that the frameworks for the development of digital audio broadcasting (DAB) and broadcast-type mobile TV services in Hong Kong, set out at **Annexes A and B** respectively, should be adopted.

A & B

JUSTIFICATIONS

Sound broadcasting landscape

2. Conventional sound broadcasting services are transmitted by means of long established analogue systems (Amplitude Modulation (AM) or Frequency Modulation (FM)). In Hong Kong, we have seven FM channels and seven AM channels with a territory-wide coverage. Three sound broadcasters, i.e. a Government department – Radio Television Hong Kong (RTHK) – and two commercial licensees – Hong Kong Commercial Broadcasting Limited (CRHK) and Metro Broadcast Corporation Limited (Metro) – currently run a total of seven FM channels and six AM channels. A fourth sound broadcaster, Wave Media Limited (Wave Media), was granted a licence on 11 November 2008 to establish and operate a new service on the remaining AM channel.

Digital audio broadcasting

Characteristics

3. Broadcasting technology has continued to evolve. The latest development in digitisation enables the provision of higher audio and/or visual quality and multi-channel DAB services, as compared to analogue broadcasting. DAB was first developed in Europe back in the late 1980s to early 1990s. It operates primarily in a radio frequency called Band III (and may also be broadcast over other frequency bands, which are however less commonly used worldwide). It deploys digital compression and combining

technologies, and is therefore more spectrum-efficient. In other words, DAB is capable of providing more programme services in a given frequency multiplex, offering high sound quality comparable to CD, and allowing for transmission of texts and/or pictures along with pure sound. To launch DAB services, broadcasters will, however, have to invest quite heavily in digital transmission equipment, while listeners will have to acquire new digital radio sets to receive programmes broadcast via DAB.

Established policy

4. Following the outcome of a public consultation exercise conducted in 2000, we have been taking a market-driven approach in respect of the development of DAB in Hong Kong. The Office of the Telecommunications Authority (OFTA) has set aside frequencies in Band III¹ and L Band² for interested parties to apply for DAB trials. RTHK has conducted extensive DAB technical trials in Band III. CRHK and Metro joined a DAB technical trial in L Band led by the Government back in 1998. These trials, particularly those on Band III, were successful and confirmed the technical feasibility of running DAB in Hong Kong. In December 2008, in the context of developing the mobile TV services framework, we have indicated that the provision of DAB as value-added services may be provided on up to 50% of the spectrum capacity to be allocated for mobile TV services (more details in paragraphs 16 and 17 below).

Latest developments

5. We have seen an increasing trend of development of DAB services overseas. In this regard, UK is front runner in developing DAB services since the 1990s and has a take-up reaching around 27% of the radio listening public. A more recent example is Australia which rolled out its DAB services in 2009. In Hong Kong, we have also noticed an increased market interest in the development of DAB services, including the application for a trial permit from the Telecommunications Authority (TA) by Wave Media to carry out trial transmissions of DAB on Band III for a six-month period from 1 November 2009. It is also relevant to note that DAB receivers are now much more affordable. The retail price of a standalone receiver is down to around \$600 and prices still appear to be falling.

6. Separately, in September 2009, the Government announced the

¹ Band III has been used for DAB services in Europe for some time but the use of this frequency band for broadcast-type mobile TV services is also now feasible.

² The use of the L Band for DAB or mobile TV services is not popular and this frequency band would be reserved subject to further development of the worldwide market.

decision to task RTHK to be the public service broadcaster in Hong Kong and to expand its scope of service, including the provision of DAB services by RTHK through the use of a Band III multiplex for public service broadcasting (PSB) purposes.

7. Against the above background and in accordance with our established market-led policy, we consider that it is now appropriate to introduce DAB in Hong Kong in a phase-by-phase manner. We have drawn up an implementation framework for the launch of DAB services in Hong Kong, at **Annex A**. The salient features of the framework are summed up as in paragraphs 8 to 15 below.

Proposed implementation framework for DAB development

Spectrum availability and allocation

8. Worldwide experience has shown that Band III frequencies are most suitable for DAB services. In Hong Kong, we have four 1.5MHz multiplexes available in Band III, each of which can carry at least seven CD-quality audio channels based on the prevailing Eureka 147 DAB standard. However, a more advanced standard, DAB+, has gradually become the industry norm. This provides sound quality equivalent to that possible on DAB but at a lower data rate using sophisticated compression techniques. For one Band III multiplex, up to 13 CD-quality audio channels can be provided. Taking into account overseas experience with DAB implementation, the value of the frequency spectrum and RTHK's plan to launch DAB services, we consider it prudent at this stage to first release one 1.5 MHz Band III multiplex for the provision of DAB services starting from late 2010 or early 2011. Depending on market demand, we may consider releasing further multiplexes for the provision of DAB services in due course.

9. Unlike the case of digital terrestrial television (DTT) which offers opportunities for analogue switch-off and deployment of the UHF Band frequencies involved for more valuable use in broadcasting and other communications services, the listening public in advanced overseas jurisdictions like the UK and the US generally regard DAB as a supplement to, rather than a replacement of existing analogue AM/FM services. In line with international practices, there is no plan for switching off analogue AM and FM services.

Scope of service

10. Interested parties would be encouraged to provide new programmes through DAB to add diversity to the choice of radio programme services

available in Hong Kong. Existing broadcasters may be allowed flexibility to simulcast their current analogue services in order to improve reception quality of their existing services, particularly in the case of AM broadcast.

11. In addition, DAB services provided will not be subject to any “positive” programme requirements, i.e. minimum requirement for programmes on specific topics such as arts and culture, or for specific target audience such as youth and elderly. However, during the formal licence application stage, applicants who are interested in providing DAB services will be required to provide detailed proposals on their programming plans and the target audience. Proposals submitted by successful applicants would be binding and form part of their licences. The broadcasters will be required to broadcast announcements in the public interest provided by the Government (one minute per clock-hour at most on a per channel basis) and publicity materials of the BA (twice daily for not more than one minute per channel, subject to a cap of five minutes per week per channel). This regulatory approach is in line with the current practice for the launch of DTT to give room for new contents to flourish.

Network construction

12. DAB service providers would have to bear the capital and operating costs for establishing and operating their DAB network to achieve territory-wide coverage. In Hong Kong, seven transmission stations located at strategic hilltop sites are established and maintained to provide territory-wide FM radio coverage. RTHK is currently the manager of these sites and the existing commercial broadcasters have been using the common facilities (such as antenna) on a cost-sharing basis. In order to provide similar territory-wide coverage as FM services, it is anticipated that DAB transmitters will be co-located at the existing FM transmission stations. Having regard to the capacity constraint of the existing hilltop sites and efficient use of spectrum resources, successful applicants for the first Band III multiplex will be required to share the use of the multiplex as well as a single set of transmission equipment to be accommodated in the existing seven FM hilltop sites. They will share the capital and operating costs of the infrastructural facilities among themselves on an equitable basis, and the Telecommunications Authority may intervene and adjudicate if mutual agreement cannot be reached.

13. Similar to DTT, DAB network construction would be implemented in phases. Based on our estimate, a network that would provide coverage similar to the analogue FM coverage can be built within three years. The total capital cost for transmitting facilities to provide one DAB multiplex is estimated to be around \$35 million to \$40 million.

Licence arrangement

14. In line with the existing practice to impose licence fees on television/sound broadcasting licensees on a cost recovery basis, successful applicants would have to pay licence fees to cover the additional costs incurred by the Television and Entertainment Licensing Authority (TELA) and OFTA in regulating the new DAB services. On par with the arrangement for analogue broadcasting, no spectrum utilisation fees (SUF) will be charged for the use of Band III frequencies for DAB purpose.

Implementation timetable

15. Any party which is interested to provide DAB services via the Band III multiplex set out in paragraph 8 above (including existing licensees or new applicants) will be invited to submit application to the Broadcasting Authority (BA) by 30 April 2010 in accordance with the “Guidance Note for Those Interested in Applying for Licences to Establish and Maintain in Hong Kong a Broadcasting Service under Part IIIA of the Telecommunications Ordinance (Cap.106)”.³ If a successful applicant is a new comer, a new sound broadcasting licence will be granted under the Telecommunications Ordinance. On the other hand, if the successful applicant is an existing licensee, its existing sound broadcasting licence may be amended in accordance with established procedures.

Proposed implementation framework for Mobile TV

Mobile TV

16. On 16 December 2008, the Council ADVISED and the Chief Executive ORDERED that mobile TV services should be developed in Hong Kong. Among other things, the implementation framework covers the release of one UHF Band multiplex and two Band III multiplexes for the launch of new broadcast-type mobile TV services, with up to 50% flexibility in the use of the transmission capacity to introduce DAB or other value-added services like datacasting. In light of the latest market development and the proposed release of Band III frequencies for DAB services, we have re-visited the issue and have come to the conclusion that only one UHF Band frequency should be released for introduction of broadcast-type mobile TV. The industry has clearly indicated that UHF Band multiplex is the most suitable for mobile TV use. It has a much larger capacity and is superior to Band III multiplexes in delivering mobile TV services. This is also in line with the recent discussion with the

³ Copy is available from the website of the BA at <http://www.hkba.hk/>.

Legislative Council Panel on Information Technology and Broadcasting, which considers that Band III should be reserved for DAB development.

17. As we have proposed to allocate one Band III multiplex for the introduction of DAB services, we will remove the flexibility for introducing DAB services in the mobile TV context, and adjust the cap allowed for providing other value-added communications services from 50% to 25% of the spectrum allocated. This brings the mobile TV implementation framework in line with that of DTT (also allowing 25% flexibility in the DTT transmission capacity for the provision of value-added service). The revised implementation framework for broadcast-type mobile TV services is attached at **Annex B**. The Office of the Telecommunications Authority will announce details on the auction of the spectrum for mobile TV, which will be held in the second quarter of this year.

IMPLICATIONS OF THE PROPOSAL

18. The proposal is in conformity with the Basic Law, including the provisions concerning human rights. The implementation of DAB and mobile TV has financial, civil service, economic and environmental implications as set out at **Annex C**. The proposal to facilitate the development of DAB and mobile TV services in Hong Kong is in line with the sustainability principle of achieving a market-based economy which provides the resources to meet the needs and aspirations of the population both now and in the future.

PUBLIC CONSULTATION

19. The Government consulted the public on digital terrestrial broadcasting, including DAB, in 2000 and 2003-04. The Government also conducted consultation on digital broadcasting concerning mobile TV and other related issues in 2007 and 2008 respectively. In general, the public and industry support our market-driven approach to the introduction of new broadcasting technology. The implementation frameworks for DAB and mobile TV are in line with the outcome of the consultation, taking into account the latest technological and market development. We have consulted the BA which is supportive to the proposal to implement DAB in Hong Kong.

PUBLICITY

20. We will hold a press conference to promulgate the implementation frameworks set out in Annexes A and B and issue a press release on 11 February 2010. A spokesperson will be made available to answer enquiries from the media and the public. We will also brief the Legislative Council Panel on Information Technology and Broadcasting.

ENQUIRY

21. Any enquiry about this brief may be directed to Mr Aaron Liu, Principal Assistant Secretary for Commerce and Economic Development (Communications and Technology) A at 2189 2236 or aaronliu@cedb.gov.hk.

Commerce and Economic Development Bureau
11 February 2010

Framework for Development of Digital Audio Broadcasting (DAB) Services in Hong Kong

(A) Implementation Timetable

We aim to commence the launch of DAB by late 2010/early 2011, with the digital network extended to cover 95% of the territory by 2013. Milestones will be set for the network development and service provision, with performance bond at an appropriate amount to be imposed on the successful applicant.

There is no plan for analogue switch-off. The Government will monitor market and technology development and review the situation within reasonable time after the launch of the DAB service.

(B) Technical Standards

We will adopt a technology-neutral approach. It will be for the broadcasters to decide on the technical standards to be adopted. For planning purpose, we note that Eureka 147 is the prevailing technical standard providing DAB services using Band III frequency, which supports seven CD-quality audio channels in one Band III multiplex. However, if the more advanced DAB+ standard is used. Up to 13 CD-quality audio channels can be provided through one Band III multiplex.

(C) Spectrum Allocation and Scope of Service

Out of the four Band III multiplexes (i.e., a frequency channel for digital transmission) available to Hong Kong, we will invite interested parties (including existing sound broadcasting licensees and new licence applicants) to submit applications for sharing the transmission capacity of one multiplex (219.584 – 221.120 MHz, also known as Channel No. 11C) for the provision of DAB services covering the territory of Hong Kong. Spectrum utilisation fees will not be required.

Taking into account overseas experience with DAB implementation and the value of the frequency spectrum, we consider it prudent to release **one 1.5 MHz Band III multiplex** for DAB (i.e., **capable of carrying seven CD-quality audio channels** with a territory-wide coverage based

on the prevailing Eureka 147 DAB technology or **up to 13 CD-quality audio channels** if DAB+ technology is used). The Government has the discretion to release more than one multiplex should there be meritorious applications which justify such release. L Band will be reserved.

Applicants will be required to submit their investment and programming plans before the deadline to be specified by the Administration. The DAB services shall not be subject to requirements on programming genres. The operator(s) will be required to broadcast announcements in the public interest provided by the Government and publicity materials of the Broadcasting Authority (BA).

(D) Licensing Arrangements

Commercial DAB services should be provided through a sound broadcasting licence issued under Part IIIA of the Telecommunications Ordinance (TO)(Cap. 106), and regulated under the TO and Part IV of the Broadcasting Authority Ordinance (Cap. 391). Any licensing application, either by new applicant(s) or existing commercial sound broadcaster(s), will be considered in accordance with the licensing regime under the TO. Licences of the existing broadcaster(s) may be suitably amended upon successful application. New licences will be granted to successful new comers.

DAB services will also be subject to the relevant radio codes of practice promulgated by the BA, and technical directions to be issued by the Telecommunications Authority (TA), as in the case of existing analogue sound broadcasting services.

(E) Access to Hilltop Broadcasting Sites

Sharing of existing hilltop broadcasting site facilities (including transmission equipment) is necessary and will be subject to commercial agreement among the DAB operators. The TA could intervene and adjudicate if mutual agreement cannot be reached.

**Framework for Development of
Broadcast-type Mobile TV Services in Hong Kong**

(A) Spectrum Availability

The following frequency multiplex (i.e., a frequency channel for digital transmission) in the relevant band of frequency spectrum should be released for the introduction of broadcast-type mobile TV services in Hong Kong:

One frequency multiplex of 8MHz (678MHz – 686MHz, also known as Channel No. 47) in UHF Band.

(B) Spectrum Allocation

The spectrum to be released in (A) above should be allocated primarily for development of broadcast-type mobile TV services. While at least 75% of the transmission capacity should be used to provide mobile TV services, the operator may harness the remaining capacity of the UHF Band multiplex allocated for delivery of other services such as datacasting. To allow further flexibility, the mandatory percentage of transmission capacity dedicated for mobile TV services will be subject to review by OFTA within five years from the assignment of the frequency multiplex to the successful bidders.

(C) Spectrum Assignment

The spectrum to be released primarily for mobile TV services in (A) above should be assigned through auction with a pre-qualification process. The spectrum utilisation fee should be determined by auction. Subject to (F) below, bidders should propose obligations to roll out mobile TV services taking into account their deployment plan of the relevant mobile TV transmission technology. Such milestones will be tied with performance bond at an appropriate amount to be imposed on the successful bidder.

(D) Licensing Arrangements

Under the Telecommunications Ordinance (TO) (Cap. 106), an operator of the network used to transmit mobile TV services via the assigned spectrum is required to obtain a unified carrier licence¹. In case that the successful bidder rents out its transmission capacity to another mobile TV service provider, the latter is required to obtain a services-based operator licence for the provision of mobile TV services and other permitted telecommunications services to the public.

Regarding the regulation of mobile TV programming, the content of mobile TV, either local broadcast-type or streaming-type, should be subject to regulation by general laws but not the Broadcasting Ordinance (Cap. 562)². To enable self-regulation, the industry will be required to develop codes of practice on provision of mobile TV services before service commencement. The codes should include, among others, the requirement of conditional access with a view to protecting public morals and children.

(E) Access to Hilltop Broadcasting Sites

Sharing of existing hilltop broadcasting site facilities is supported and will be subject to commercial agreement while the TA could intervene and adjudicate if mutual agreement cannot be reached.

(F) Geographical Coverage

As prospective mobile TV service operators will be able to set up transmitting stations by sharing the hilltop broadcasting sites and facilities of terrestrial television broadcasters, provision of coverage for 50% of the population within 18 months from the grant of the unified carrier licence should be set out as a licence obligation for the operators.

Coverage in tunnels as well as the mass transit railway network will not be mandatory. Mobile TV service operator may negotiate with the

¹ For an incumbent carrier, it may opt to merge its existing carrier licence(s) with the new unified carrier licence.

² A provider of mobile TV services that are not primarily targeting Hong Kong will need a non-domestic television programme service licence under the BO.

railway company and tunnel operators for coverage based on commercial consideration.

(G) Technical Standards

We should adopt a market-led and technology-neutral approach by leaving the market to select the technical standards for broadcast-type mobile TV services.

(H) Timetable

We aim to auction the frequency spectrum and license local broadcast-type mobile TV services within 2010.

Communications and Technology Branch,
Commerce and Economic Development Bureau
February 2010

Financial, Civil Service, Economic and Environmental Implications

Financial and Civil Service Implications

With respect to mobile TV, there will be additional lump-sum revenue for Government when the frequency spectrum is auctioned in 2010. The spectrum utilisation fee receivable will be determined by auction. Through updating the mobile TV implementation framework to withdraw two Band III multiplexes, the revenue forgone is estimated to be \$2 million.

2. The prospective mobile network operator needs to hold a unified carrier licence or a services-based operator licence issued under the Telecommunications Ordinance. The exact additional revenue to be generated in respect of the unified carrier licence would hinge on whether the mobile TV spectrum is to be taken up by new or existing unified carrier licensees. Assuming a new unified carrier licence is granted, the annual licence fee should be around \$5.5 million (comprising fixed fee, spectrum fee, base station fee and customer connection fee). In case that the mobile TV spectrum is assigned to an existing unified carrier licensee, the annual licence fee is estimated to be around \$0.5 million as the licensee has already paid the fixed fee and customer connection fee under its existing licence. The licence fee payable by the operator will by and large seek to recover the full cost incurred by OFTA in regulating the services and should be subject to review on the basis of the full-cost recovery principle.

3. With respect to DAB services, in line with the Government's policy of full-cost recovery, the additional costs incurred for administering the new DAB services will be recovered from the licensees. The additional revenue will depend on the mix of existing and new licensees and the number of DAB channels taken up.

4. The estimated capital investment for the DAB transmitting facilities amounts to \$35 million to \$40 million which would be funded by the participating DAB operators. TELA and OFTA will absorb the extra financial and staffing resources for co-ordination with the industry on the implementation details. No additional staff will be required by TELA and OFTA for regulating the proposed new DAB services.

Economic Implications

5. The introduction of DAB and mobile TV services will be conducive to widening programme choices for multimedia and mobile communications users and enhancing development of the local media and telecommunications industry as a whole. It will also bring in capital investment for the broadcasting and telecommunications networks and associated content production facilities. The incremental economic activities and employment opportunities thus generated will largely hinge on the extent of service coverage which in turn will be based on the business plans of the successful bidders as well as the spill-over along the supply chain from content production, network conveyance to service provision and innovation. In relation to mobile TV services, ancillary services such as datacasting may also be offered to meet public demand.

Environmental Implications

6. The hilltop transmitting stations of new mobile TV network are expected to be accommodated in the DTT infrastructure established by the two free-to-air television broadcasters, whereas those of new DAB networks are expected to be co-located at the existing FM transmission stations. As such, civil engineering works at the existing hilltop sites for new DAB and mobile TV networks will be of a small-scale and confined within the site boundary of the existing FM/DTT infrastructure and shall follow the relevant statutory requirements including those under the Environmental Impact Assessment Ordinance (Cap. 499).