

# **Assignment of the Available Radio Spectrum in the 2.3 GHz Band for Provision of Broadband Wireless Access Services**

## **Statement of the Telecommunications Authority**

**9 March 2011**

### **INTRODUCTION**

In January 2009, the Telecommunications Authority (“TA”) made available for bidding, for the provision of broadband wireless access (“BWA”) services in Hong Kong, a total of 195 MHz of radio spectrum, including 90 MHz of radio spectrum in the 2.3 GHz band (2300 – 2390 MHz) and 105 MHz<sup>1</sup> of radio spectrum in the 2.5/2.6 GHz bands (2500 – 2690 MHz). The auction is hereinafter referred to as the 2009 auction. While the 90 MHz of radio spectrum in the 2.5/2.6 GHz bands were auctioned off<sup>2</sup>, the remaining 15 MHz of radio spectrum in the 2.5/2.6 GHz bands and 90 MHz of radio spectrum in the 2.3 GHz band were not acquired by any bidder in the 2009 auction. The leftover radio spectrum has subsequently been put under the Spectrum Release Plan (“SRP”) published by the TA<sup>3</sup>. On 14 December 2010, the TA issued a document inviting expression of interest (“EOI”) from potential bidders to bid for the 90 MHz of radio spectrum in the 2.3 GHz band for the provision of BWA services in Hong Kong (the “Invitation”)<sup>4</sup>.

2. As indicated in the Invitation, the TA has received enquiries on the release of the leftover spectrum in the 2.3 GHz band. The EOI exercise is intended to assist the TA to decide whether there is sufficient market demand for him to conduct an auction for the concerned radio spectrum. Through the Invitation, the TA has also invited views and comments on a set of proposed auction rules and licensing arrangements

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<sup>1</sup> This consisted of 15 MHz of unpaired spectrum (2600 – 2615 MHz) and 90 MHz of paired spectrum (2500 – 2515 MHz paired with 2620 – 2635 MHz, 2540 – 2555 MHz paired with 2660 – 2675 MHz, and 2555 – 2570 MHz paired with 2675 – 2690 MHz).

<sup>2</sup> The 90 MHz of paired spectrum in the 2.5/2.6 GHz bands as mentioned in footnote 2 were auctioned off for more than HK\$1.5 billion. The details of the 2009 auction can be found at <http://www.ofta.gov.hk/en/industry/broadband/main.html>.

<sup>3</sup> The latest SRP is available at <http://www.ofta.gov.hk/en/freq-spec/plan2010.pdf>.

<sup>4</sup> The Invitation for Expression of Interest in Bidding for the Available Radio Spectrum in the 2.3 GHz Band issued on 14 December 2010 can be downloaded at <http://www.ofta.gov.hk/en/tender/p03.pdf>.

for application in the event that, taking into account the outcome of the EOI exercise, the auction for the concerned radio spectrum is to go ahead.

### **SUBMISSIONS IN RESPONSE TO THE INVITATION**

3. By the deadline of 13 January 2011, the TA has received a number of submissions in response to his invitation for EOI. Since the submissions contain commercially sensitive information, details of the individual submission and the identities of the respondents will not be disclosed.

4. Having duly considered the views and comments of the respondents, the TA sets out in this Statement his decision regarding the auction of the radio spectrum in the 2.3 GHz band and his responses to some of the comments received.

### **AUCTION OF SPECTRUM IN THE 2.3 GHz BAND**

5. The TA invited parties to indicate their interest in bidding for the 90 MHz of radio spectrum in the 2.3 GHz band and to provide supporting information including the preferred amount of bandwidth they wish to acquire.

#### *Views and Comments from Respondents*

6. Most submissions indicated interest in bidding for 30 MHz of radio spectrum, while one respondent expressed interest in acquiring more than 30 MHz for provision of BWA services. One respondent however argued that it would be premature to release the spectrum on the ground that the BWA technology has not developed much further since the 2009 auction.

#### *TA's Considerations and Decision*

7. The TA has been monitoring the market closely. Contrary to the observation of the above respondent, the TA notes that there has been a

rapid development of BWA technologies using the 2.3 GHz band over the last two years. He also notes an increasing number of deployments of wireless broadband systems working in the 2.3 GHz band around the world<sup>5</sup> making use of a variety of technologies<sup>6</sup>.

8. Pursuant to the Radio Spectrum Policy Framework promulgated by the Government in April 2007<sup>7</sup>, the TA will follow a market-based approach in releasing radio spectrum for assignment if he considers that there are likely to be competing demands for the concerned spectrum.

9. From the submissions received, the TA notes that a number of parties have expressed interest in acquiring the radio spectrum in the 2.3 GHz band. Taking also into account the latest market development, **the TA decides that he will conduct an auction for assignment of the available spectrum in the 2.3 GHz band.**

## **PROPOSED AUCTION RULES AND LICENSING ARRANGEMENTS**

10. The TA indicated in the Invitation that if an auction for the available radio spectrum in the 2.3 GHz band was to be conducted, he was of the preliminary view that the auction rules and licensing arrangements as adopted for the 2009 auction should be largely applicable to the forthcoming auction. A brief summary of the proposed auction rules and licensing arrangements were set out in an Annex to the Invitation and it is repeated in the Annex to this Statement for ease of reference.

### *Views and Comments from Respondents*

11. Except for one submission, all respondents either agreed to or did not provide specific comment on the proposed auction rules and licensing frameworks.

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<sup>5</sup> According to a report by the WiMAX Forum ([http://www.wimaxforum.org/sites/wimaxforum.org/files/page/2011/01/Monthly\\_Industry\\_Report\\_January2011.pdf](http://www.wimaxforum.org/sites/wimaxforum.org/files/page/2011/01/Monthly_Industry_Report_January2011.pdf)), there are 55 deployments using 2.3 GHz band around the world as at January 2011.

<sup>6</sup> BWA technologies which work in the 2.3 GHz band include WiMAX and TD-LTE.

<sup>7</sup> The framework is available at <http://www.cedb.gov.hk/ctb/eng/legco/pdf/spectrum.pdf>.

12. One respondent pointed out that there was a spectrum cap restriction of 30 MHz imposed in the 2009 auction, and questioned why the successful bidders in that auction would be permitted to bid for the leftover spectrum as this would undermine the intention of the auction rule for the 2009 auction.

TA's Considerations and Decision

13. It is worth highlighting that the TA has not taken a view on a specified threshold level of spectrum holdings in a frequency band (or a number of frequency bands) beyond which additional spectrum acquisition by a spectrum holder would automatically render it a threat to competition in the market. And following the practice that he has consistently adopted in all the auction exercises that has been conducted thus far, the TA will consider the spectrum cap requirement for each and every individual auction based on a fresh consideration of inter-alia the prevalent market situation and the state of technology development.

14. In the 2009 auction, a spectrum cap was imposed. This was based on the consideration that without any spectrum cap, all the available spectrum of 195 MHz in the 2.3 GHz and 2.5/2.6 GHz bands could in principle be acquired by a single bidder. The prospect of having only one network operator capable of providing BWA services would clearly not be in the interest of consumers. The cap was set at 30 MHz because such bandwidth was considered sufficient for an operator to provide a territory-wide service with acceptable coverage and quality in a technically efficient manner. Three bidders were successful in acquiring through the 2009 auction the necessary spectrum in the 2.5/2.6 GHz band for the provision of BWA services in Hong Kong. They are all incumbent mobile network operators or their joint venture. These operators are expected to launch commercial services in the near future.

15. Meanwhile, the mobile market in Hong Kong remains one of the most competitive in the world, with the operators competing fiercely with one another on price and innovative service. Apart from the BWA services, the four existing third generation ("3G") mobile network operators who have acquired the radio spectrum in the 2 GHz band in an

auction exercise held in 2001 are providing mobile broadband services in competition with the future BWA services. There is no inhibition for any of the incumbent mobile operators to upgrade their networks using the state-of-art technologies for providing high capacity mobile communications similar to the BWA and, indeed, technical solutions are available today.

16. In this regard, it has been well publicized that the mobile data market has witnessed an explosive growth in recent years. For example, the mobile data usage has seen a year-on-year growth of 189%, from 638 terabytes in December 2009 to 1,847 terabytes in December 2010<sup>8</sup>. The TA is minded to ensure that the incumbent mobile operators will have sufficient network capacity to meet the ongoing booming market demand. And the supply of radio spectrum in a timely manner under the market-based approach would ensure that the incumbent operators can compete on a level playing field with prospective new entrants to meet such demand.

17. Against the foregoing, in considering the need or otherwise to impose any spectrum cap in the upcoming auction, the TA has given regard to whether the state of competition in the market will be significantly changed if any of the incumbent mobile operators (including any of the successful bidders in the 2009 auction) is allowed to take part. In the TA's view, the answer is in the negative. It is therefore unnecessary to exclude those successful bidders from acquiring the leftover spectrum.

18. Having considered the submissions received, **the TA decides that the auction rules and licensing arrangements in the forthcoming auction should largely follow those of the 2009 auction.** Specifically, both new entrants and incumbent licensees may participate in the auction, and that a spectrum cap of 30 MHz will be imposed on this occasion.

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<sup>8</sup> See the key statistics for wireless services in Hong Kong at [http://www.ofta.gov.hk/en/datastat/eng\\_wireless.pdf](http://www.ofta.gov.hk/en/datastat/eng_wireless.pdf)

## **WAY FORWARD**

19. The TA aims to conduct the auction for assigning the available radio spectrum in the 2.3 GHz band in the second half of 2011. The bidding documents including an Information Memorandum for information of interested parties will be published in due course. The minimum amount of spectrum utilization fee will also be announced by the Secretary for Commerce and Economic Development upon the publication of the bidding documents.

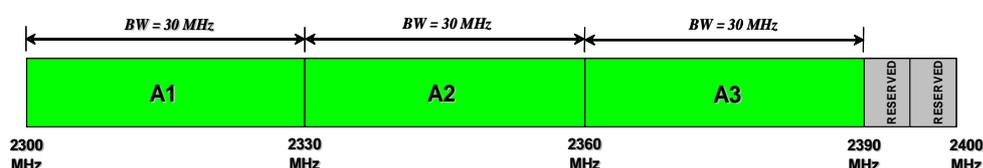
**Office of the Telecommunications Authority**  
**9 March 2011**

**Summary of Proposed Auction Rules and Licensing Arrangements  
for the Available Radio Spectrum in the 2.3 GHz Band  
(based largely on the 2009 auction)**

**Proposed Auction Rules:**

- (a) The available radio spectrum will be divided into three frequency bands, each with a bandwidth of 30 MHz;

**Band plan for 2300 – 2390 MHz**



- (b) The auction will be conducted using the simultaneous multiple round ascending format whereby the three frequency bands will be auctioned simultaneously over multiple rounds with the price increasing on each frequency band independently;
- (c) New entrants and incumbent licensees, including the successful bidders in the 2009 auction, may participate in the Auction;
- (d) The maximum amount of spectrum among the frequency bands that may be assigned to each bidder or a group of connected bidders in the auction (i.e. the spectrum cap) is 30 MHz; and
- (e) The use of the frequency bands will be subject to a one-off upfront payment of spectrum utilization fee, the amount of which is to be determined by the auction.

**Proposed Licensing Arrangements:**

- (a) Frequency bands will be assigned for use under unified carrier licences for a period of 15 years;
- (b) Licensees will be allowed to provide fixed, mobile or a combination of these services using the frequency bands;
- (c) Licensees will be required to submit performance bond to guarantee network and service rollout. Where the authorized scope of service includes a fixed service, a minimum coverage of 200 residential and/or commercial buildings within 5 years is required. Where the authorized scope of service includes a mobile service, a minimum coverage of 50% of Hong Kong population within 5 years is required;
- (d) Licensees will be required to implement and facilitate at their own expense operator number portability and mobile number portability as directed by the TA. In addition, licensees may choose to implement fixed-mobile number portability on a voluntary basis at their own costs;
- (e) As each of the three frequency bands consists of 30 MHz of unpaired spectrum, it is expected that the licensees will deploy Time Division Duplex (“TDD”) technologies for their service platforms. However, licensees will not be subject to use of any particular technical standards for provision of fixed, mobile or a combination of these services provided that the technical standards that they adopt conform to widely recognised international standards; and
- (f) To optimise the performance and avoid mutual interference of the three TDD networks that will operate in the 2.3 GHz band, the three licensees may be required, if directed by the TA, to adopt necessary measures such as synchronising their networks with one another.