

# **Statement of the Communications Authority**

## **Use of the 5 GHz Shared Band for the Provision of Public Mobile Services**

**4 June 2018**

### **INTRODUCTION**

There is at present a total amount of 580 MHz of spectrum in the 5 GHz band (the “5 GHz Shared Band”), consisting of four sub-bands of frequencies in 5150 – 5250 MHz (100 MHz), 5250 – 5350 MHz (100MHz), 5470 – 5725 MHz (255 MHz), and 5725 – 5850 MHz (125 MHz), that are used by telecommunications apparatus without any need for licensing if the apparatus is in compliance with the requirements stipulated under the Telecommunications (Telecommunications Apparatus) (Exemption from Licensing) Order (Cap. 106Z) (“Exemption Order”). Such apparatus, according to the Exemption Order, should be for private use in an unprotected and uncoordinated manner.

2. The 5 GHz Shared Band is also being utilised for the provision of public wireless local area network (“LAN”) service (or more commonly referred to as public Wi-Fi service), which is a type of public telecommunications service, under appropriate licences issued pursuant to section 8(1) of the Telecommunications Ordinance (Cap. 106) (“TO”). For the provision of public wireless LAN service within private premises not crossing unleased Government lands or public streets, any person operating relevant telecommunications apparatus in the 5 GHz Shared Band for the provision of public Wi-Fi service is deemed to be a licensee under the Class Licence for the Provision of Public Wireless LAN Services and shall comply with the terms and conditions therein. As for the provision of public wireless LAN service on or across Government lands or public streets, holders of Unified Carrier Licences (“UCL”) may do so with necessary authorization under their licences. In either case, all relevant telecommunications apparatus used by the licensees are required to comply with the same set of

technical criteria stipulated under the Exemption Order and to operate in an unprotected and uncoordinated manner.

3. With the emergence of new mobile technologies such as Licensed Assisted Access (“LAA”), LTE-Unlicensed (“LTE-U”), LTE Wi-Fi Aggregation (“LWA”), MulteFire, etc. using the 5 GHz Shared Band for the provision of fourth generation mobile services based on the Long Term Evolution standard, the 5 GHz Shared Band may potentially be deployed for the provision of public mobile services in Hong Kong. If so, this will lead to a significant addition to the existing amount of 552 MHz of licensed mobile spectrum<sup>1</sup> assigned to Mobile Network Operators (“MNOs”), and accordingly enhancement in service quality to be experienced by mobile service users.

4. Against this background, the Communications Authority (“CA”) issued a consultation paper<sup>2</sup> (“Consultation Paper”) on 1 February 2018 to solicit views from the public on the proposals to make available all 580 MHz of the 5 GHz Shared Band for the provision of public mobile services, the associated regulatory and licensing regime, as well as the proposed allocation of the 5725 – 5850 MHz sub-band to mobile service on a primary basis such that it will co-exist with the existing uses (including operation of telecommunications apparatus such as Wi-Fi equipment, and industrial, scientific and medical equipment) under the Hong Kong Table of Frequency Allocations<sup>3</sup>. By the close of the consultation on 8 March 2018, eight submissions were received from the following respondents<sup>4</sup> –

- Ericsson Limited (“Ericsson”)
- Facebook, Inc. (“Facebook”)
- Hong Kong Telecommunications (HKT) Limited (“HKT”)
- Hutchison Telephone Company Limited (“Hutchison”)

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<sup>1</sup> Currently, radio spectrum assigned to MNOs for the provision of public mobile services includes spectrum in the 850 MHz, 900 MHz, 1800 MHz, 1.9 – 2.2 GHz, 2.3 GHz, and 2.5/2.6 GHz frequency bands.

<sup>2</sup> The consultation paper is available at [https://www.coms-auth.hk/filemanager/en/content\\_711/cp20180201.pdf](https://www.coms-auth.hk/filemanager/en/content_711/cp20180201.pdf).

<sup>3</sup> The 5150 – 5250 MHz, 5250 – 5350 MHz and 5470 – 5725 MHz frequency sub-bands are already allocated to mobile services on a primary basis together with other existing uses.

<sup>4</sup> The submissions are available at [https://www.coms-auth.hk/en/policies\\_regulations/consultations/completed/index\\_id\\_437.html](https://www.coms-auth.hk/en/policies_regulations/consultations/completed/index_id_437.html).

- Qualcomm Incorporated (“Qualcomm”)
- SmarTone Mobile Communications Limited (“SmarTone”)
- STT Limited (“STT”)
- Wi-Fi Alliance

5. Having carefully considered all the views and comments received, the CA sets out in this Statement its responses to the submissions and decisions on the regulatory arrangement. For the avoidance of doubt, the CA has taken into account and given thorough consideration to all of the submissions before arriving at the decisions promulgated in this Statement, even though not all of the issues raised are specifically mentioned or addressed herein.

## **PROPOSAL IN THE CONSULTATION PAPER**

6. In the Consultation Paper, the CA sets out issues which it has taken into account in formulating the regulatory and licensing framework for using the 5 GHz Shared Band for the provision of public mobile services. The issues are summarised as follows –

### ***(a) Adoption of widely recognised technology***

While the CA would as far as possible adhere to a technology neutral approach, the technologies to be adopted should base on widely recognised international standards and which would promote effective sharing of the spectrum for use with other devices and apparatus in the 5 GHz Shared Band. The CA considers that the development of LAA appears to be more prominent in the world as compared with other available standards.

### ***(b) Harmonisation with existing regime for public mobile services***

Noting that from the users’ perspective, LAA would be essentially no different from ordinary mobile services, the CA considers it reasonable and appropriate for LAA to be licensed and regulated in

a manner consistent with the existing regime applicable to the provision of public mobile services using licensed radio spectrum and be subject to the same rights and obligations.

***(c) Types of licensees authorised to deploy LTE in the 5 GHz Shared Band***

In view of the fact that the operation of LAA would need to make use of the licensed anchor operating in the licensed mobile spectrum for control and signalling, it is noted that for the time being, only those UCL holders assigned with licensed mobile spectrum would have the capability to provide LAA in an efficient and continuous manner to the satisfaction of the CA throughout the entire tenure of their UCL.

7. With the above considerations, the CA outlines in the Consultation Paper the proposed regulatory and licensing regime for using the 5 GHz Shared Band for the provision of public mobile services. In gist,

- (a) the use of the 5 GHz Shared Band for the provision of public mobile services should be licensed and regulated in the same way as public mobile services provided by licensed radio spectrum under the existing regime of UCL;
- (b) only UCL licensees assigned with licensed mobile spectrum could apply to the CA for the use of the 5 GHz Shared Band for the provision of public mobile services. All relevant base stations, handsets and other radiocommunications installations operating in the 5 GHz Shared Band should comply with the same set of technical criteria as stipulated in the Exemption Order;
- (c) given the need to ensure compatibility and effective sharing with other uses and users in the 5 GHz Shared Band, the CA would initially only allow the use of LAA technology with mandatory implementation of the Listen Before Talk (“LBT”) feature; and

- (d) a new special condition (“SC”) under the UCL would be prescribed to make clear that the use of the 5 GHz Shared Band would be shared with other uses and users in an uncoordinated and unprotected manner and would not be protected from interference caused by other radio equipment operating in the same frequency band.

8. In addition, the CA proposes in the Consultation Paper that at the time when other technologies not requiring the use of licensed anchor become widely recognised and standardised internationally, any interested parties other than MNOs may apply to the CA for the use of the 5 GHz Shared Band for the provision of public mobile services.

9. Noting that under the Hong Kong Table of Frequency Allocations, the 5725 – 5850 MHz sub-band has not yet been allocated to mobile services and hence not yet ready to be used for the provision of public mobile services, the CA also proposes in the Consultation Paper to allocate the sub-band to mobile service on a primary basis on top of the existing uses, pursuant to section 32H of the TO.

## **VIEWS AND COMMENTS RECEIVED AND CA’S RESPONSES**

### **General Aspects of the Proposed Regulatory and Licensing Regime**

#### Views and Comments Received

10. In general, most of the respondents are supportive of the CA’s proposals in making available the 5 GHz Shared Band for the provision of public mobile services and the associated regulatory and licensing regime. All MNOs responding to the Consultation Paper, including HKT, Hutchison and SmarTone, welcome the CA’s proposals and generally concur that the use of the 5 GHz Shared Band should be licensed and regulated in the same way as public mobile services, only UCL licensees assigned with licensed mobile spectrum should be eligible to apply, and at the initial stage only LAA with mandatory implementation of LBT should be allowed. The proposed

technical criteria and the use of the 5 GHz Shared Band in an unprotected and uncoordinated manner are also supported by the MNOs.

11. Respondents including Ericsson, Facebook, Qualcomm and Wi-Fi Alliance support the CA's efforts to facilitate the introduction of the 5 GHz Shared Band for public mobile services and the proposed technology neutral approach to enable the deployment of technologies with appropriate sharing mechanisms. Ericsson and Qualcomm specifically point out that LAA should be a better technology than Wi-Fi in terms of compatibility, while Facebook and Wi-Fi Alliance suggest the CA to ensure fair coexistence with other uses and users before introducing other technologies, such as MulteFire, in the 5 GHz Shared Band.

12. Furthermore, Qualcomm provides in its submission updates of the latest developments of LAA. On handset and equipment availability, Qualcomm claims that its chipset for mobile devices announced in February 2018 will support full range of LTE spectrum bands including those supporting LAA. Meanwhile, full scale commercial deployment of LAA by Verizon, T-Mobile and AT&T are now underway in the United States. Other countries such as Canada, Germany, Japan, Singapore and South Korea are also actively conducting trials on LAA.

13. Nevertheless, one respondent, STT, opposes the CA's proposals and submits that the 5 GHz Shared Band should be open to all other wireless services as well. STT considers the proposal where only UCL licensees assigned with licensed mobile spectrum can apply to use the 5 GHz Shared Band to be restrictive, protective and anti-competitive. Moreover, STT claims that LAA is not yet mature and very few consumers would actually be able to enjoy the feature in the foreseeable future. Hence, it considers that the CA should be more open and flexible in this area and should not indicate preference to internationally recognised standards only.

### CA's Responses

14. The CA notes the general support made by the industry in respect of the proposal to make available the 5 GHz Shared Band for the provision of

public mobile services and the proposed regulatory and licensing regime as set out in the Consultation Paper.

15. Regarding the comment raised by STT that the 5 GHz Shared Band should be open to all other wireless applications, the CA would like to clarify that in accordance with the current frequency allocations in Hong Kong, the 5 GHz Shared Band is already utilised by different uses and users, such as by telecommunications apparatus for private use without any need for licensing, and by relevant licensees for the provision of public wireless LAN services. At the same time, the CA is aware of the recent global development trend that new mobile technologies such as LAA operating in the 5 GHz Shared Band are becoming available. It is in light of this trend that the CA has formulated the proposed regulatory and licensing regime with the objective to enable timely adoption of these new mobile technologies. The CA in general adopts a technology neutral regulatory approach and there is no preference for any particular type of technology or service. In case there are any future global technological advances enabling other innovative uses of the 5 GHz Shared Band, the CA will review and take appropriate steps in a timely manner to facilitate the development.

16. On the other hand, the CA does not agree with STT's view that LAA is not yet mature and very few customers will stand to benefit from the proposed regulatory and licensing regime. As a matter of fact, the CA observes that the development of LAA is underway and a number of trials and deployments are being conducted around the world. New handsets supporting LAA will also be available in the market soon. In this connection, the submission by Qualcomm providing updates of the latest market development for LAA supports the CA's observation. As regards STT's views that the technical standards to be used need not be widely recognised international standards and that operators other than UCL licensees assigned with licensed mobile spectrum should be allowed to apply to use the 5 GHz Shared Band, the CA maintains its stance on these issues as clearly explained in paragraph 12 of the Consultation Paper.

## **Payment of Licence Fee**

### Views and Comments Received

17. HKT, Hutchison and SmarTone submit that no licence fee should be imposed for the use of the 5 GHz Shared Band and for the installation of base stations for LAA. Also, spectrum management fee, spectrum utilisation fee (“SUF”) or base station fee should not be charged. Given that the 5 GHz Shared Band is to be used on a shared and non-exclusive basis, HKT considers it unfair to treat the 5 GHz Shared Band on an equal basis with licensed spectrum since the latter is for exclusive use and is free of interference. It also considers that the same financial concessions applicable to providers of public wireless LAN services should be applied to the use of the 5 GHz Shared Band by LAA. For base stations which are solely installed for the provision of mobile services using LAA, the corresponding base station fee should be waived, similar to the current approach applicable to femtocells under the UCL.

18. Hutchison and SmarTone share the view that LAA is mainly for enhancing the existing mobile service quality and needs to make use of carrier aggregation in conjunction with the licensed mobile spectrum. According to SmarTone, LAA base stations will likely be deployed alongside with small cells in traffic hotspot locations for traffic offloading purposes in a way very similar to Wi-Fi. Hence, no licence fee should be imposed for the use of the 5 GHz Shared Band by LAA base stations. As the coverage and capacity of LAA base stations are much less than those of macrocells and the LAA carrier is only secondary / supplementary component, SmarTone proposes that no base station fee for LAA base stations should be imposed to encourage their rollout. Hutchison further suggests that as the provision of LAA is for enhancement of service quality to mobile users, instead of imposing additional licence fees, the CA should encourage operators to invest in advanced technology and innovation to satisfy public demands.

### CA’s Responses

19. In the Consultation Paper, the CA has provided justification that the use of the 5 GHz Shared Band for the provision of public mobile services shall be licensed and regulated in the same way as public mobile services provided by licensed radio spectrum under the existing regime of UCL. Hence, the same licence fee requirements, irrespective of whether the mobile



networks and services are using the 5 GHz Shared Band or licensed mobile spectrum in other frequency bands, shall apply.

20. Unlike the use of licensed mobile spectrum, the use of the 5 GHz Shared Band has all along not been subject to any SUF or spectrum management fee in recognition of the fact that the 5 GHz Shared Band is used in an unprotected and uncoordinated manner, and without any pre-set limit on the number of uses and users sharing the band. Accordingly, no SUF or spectrum management fee will be charged for the use of the 5 GHz Shared Band for the provision of public mobile services.

21. On the other hand, under the existing licence fee requirements, each mobile base station is subject to a base station fee irrespective of the technical standard and frequency band used for the mobile service. Therefore, each LAA mobile base station (i.e. a base station deploying the 5 GHz Shared Band only) should be subject to the same base station fee. For the avoidance of doubt, if an MNO deploys both LTE and LAA in the same base station operating in both licensed spectrum and the 5 GHz Shared Band, it will remain to be counted as one base station and the use of the 5 GHz Shared Band will not incur additional base station fee.

22 Under the existing regulatory arrangement, MNOs may deploy femtocells as specific type of low power mobile equipment designed for use only in customer's premises meeting those specific technical criteria as stipulated in the UCL and these femtocells are not considered as base stations. If MNOs intend to deploy LAA for their femtocells, they may follow the existing regulatory framework for femtocell deployment provided that all relevant technical criteria are met. In that case, such femtocells will similarly not be considered as base stations for the purpose of licence fee calculation.

## **Base Station Application Procedures**

### Views and Comments Received

23. At present, licensees establishing base stations for the provision of public telecommunications services have to ensure that in addition to the approval of the CA, they also need to meet the requirements of all relevant

Government departments and should duly follow the established procedures to seek the approval of these departments. HKT considers that the normal base station application procedures should be waived for mobile base stations which are solely installed for provision of mobile services using LAA, similar to the existing arrangement for femtocells. SmarTone proposes that the application procedures should be simplified and streamlined, such as by adopting on-line registration for the installation of LAA base stations, in order to help reduce the lead-time as well as the administrative costs that will be required for the application procedure.

### CA's Responses

24. LAA mobile base stations will operate in accordance with the same technical criteria as prescribed for public Wi-Fi services (which is the same as that adopted for private use of Wi-Fi equipment under the Exemption Order). Among other things, they will all be deployed on an uncoordinated and unprotected basis. In this regard, same as Wi-Fi equipment, in general there is unlikely to be adverse issue regarding electromagnetic compatibility or non-ionizing radiation safety associated with the deployment of LAA mobile base stations. Nevertheless, all LAA mobile base stations should comply with the requirements and obtain the necessary approval of all relevant Government departments where applicable. Under such circumstances, the CA would work out with the MNOs concerned a streamlined approach for approval of LAA mobile base stations where appropriate. As clarified above, femtocells using LAA technology are not considered as mobile base stations. Therefore, the existing approval requirement and procedure for mobile base stations do not apply to these femtocells.

## **Amendment to the Hong Kong Table of Frequency Allocations**

### Views and Comments Received

25. Most respondents, including HKT, Hutchison, Qualcomm, and SmarTone, support the CA's proposal to allocate the 5725 – 5850 MHz sub-band to mobile service on a primary basis on top of the existing uses. Qualcomm and Wi-Fi Alliance further add that the CA should explore the potential use of additional spectrum to accommodate Wi-Fi operations or other

unlicensed technologies. However, STT proposes that additional allocation to the 5725 – 5850 MHz sub-band should not be confined to mobile service only, but should be open to other services as well.

### CA's Responses

26. The CA notes the general support on the proposed allocation of the 5725 – 5825 MHz sub-band to mobile service on a primary basis on top of the existing uses. Regarding the comment on the potential use of additional spectrum to accommodate Wi-Fi operations or other unlicensed technologies and the use of the 5 GHz Shared Band for other services, the CA will continue to keep in view the latest market and technology developments and conduct timely review of the regulatory arrangement in the local context.

### **CA'S DECISION**

27. Having given due consideration to all the views and comments received, the CA decides that the following regulatory arrangement should be adopted –

- (a) the 5725 – 5850 MHz sub-band will be allocated to mobile service on a primary basis on top of the existing uses pursuant to section 32H of the TO with immediate effect;
- (b) the CA will initially only allow the use of LAA technology with mandatory implementation of the LBT feature to ensure compatibility and effective sharing with other uses and users in the 5 GHz Shared Band;
- (c) initially only UCL licensees assigned with licensed mobile spectrum may apply to the CA for the use of the 5 GHz Shared Band for the provision of public mobile services using LAA technology. Subject to their application and the CA's approval, their UCLs will be suitably amended to incorporate the assignment of the 5 GHz Shared Band and to prescribe the associated technical requirements;

- (d) the use of the 5 GHz Shared Band for the provision of public mobile services in Hong Kong shall be licensed and regulated in the same way as public mobile services provided by licensed radio spectrum under the existing regime of the UCL. Licensees shall observe all the rights and obligations under the relevant provisions of the TO and the UCL, and be subject to the same licence fee requirements stipulated under the Telecommunications (Carrier Licences) Regulation (Cap. 106V);
- (e) all relevant mobile base stations, handsets and other radiocommunications installations operating in the 5 GHz Shared Band shall comply with the same set of technical criteria as stipulated in the Exemption Order. The technical requirement on LAA, along with other technical criteria for the operation of public mobile services in the 5 GHz Shared Band, will be set out in the relevant specification(s) issued by the CA; and
- (f) a new special condition under the UCL will be prescribed to make clear that the use of the 5 GHz Shared Band is shared with other uses and users in an uncoordinated manner and will not be protected from interference caused by other radio equipment operating in the same frequency band.

28. At the time when other technologies not requiring the use of licensed anchor become widely recognised and standardised internationally, any interested parties other than MNOs may apply to the CA for the use of the 5 GHz Shared Band for the provision of public mobile services. The CA will duly consider such application(s) and may give approval on a case by case basis if the applicant(s) can demonstrate to the satisfaction of the CA that –

- (a) there are widely recognised international standards adopted for these technologies;
- (b) there are network and customer equipment supporting these technologies available in the market;

- (c) there is proof of effective compatibility with different devices and apparatus sharing the spectrum in the same frequency band; and
- (d) the applicant has the capability of providing an efficient and continuous service throughout the validity period of the UCL.

29. The CA will proceed to effect the above-mentioned amendment to the Hong Kong Table of Frequency Allocations, and will handle applications from eligible UCL licensees interested in using the 5 GHz Shared Band for the provision of public mobile services for necessary amendments to their UCLs.

**Communications Authority**  
**4 June 2018**