3 迎接電訊市場新挑戰
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便利5G發展

在多段頻帶提供頻譜

5G具有高速、高容量、超可靠、大規模連接和低時延通訊等尖端技術特性，將革新流動服務用戶的使用體驗。普遍預期5G將為各行各業和智慧城市的應用（例如智能監測、關鍵實時遙距操作、遠程醫療及智能運輸）帶來巨大發展潛力。

通訊局在2019年適時把3.3吉赫、3.5吉赫、4.9吉赫，以及26吉赫及28吉赫頻帶內共1 980兆赫的無線電頻譜指配作公共流動電訊服務用途，包括提供5G服務。流動網絡營辦商由2020年4月1日起在香港推出商用5G服務。截至2021年3月，香港5G覆蓋率已超過九成人口，涵蓋各大型商場及超過50個港鐵站。

提供更多新5G頻譜以滿足營辦商的需求

為滿足各項5G應用對速度、容量和覆蓋範圍的需求，通訊局將會向市場供應更多位於不同頻帶的頻譜。通訊辦協助通訊局和商務及經濟發展局局長（商經局局長）於2020年第三季展開聯合公眾諮詢，其後於2021年3月30日以聯合聲明的方式公布雙方就有關600兆赫、700兆赫及4.9吉赫頻帶內的頻譜編配和指配安排及相關頻譜使用費所作的決定。根據上述決定，以上三條頻帶內合共220兆赫的新頻譜會在2021年年底以拍賣方式指配。

以行政方式指配26吉赫及28吉赫頻帶內的頻譜

鑑於26吉赫及28吉赫頻帶內的頻譜供應充裕，通訊局採用行政方式指配該等頻帶內的頻譜。在可供指配的4 100兆赫頻譜中，有3 700兆赫的頻譜已預留作非共用頻譜，以提供大規模公共流動服務，包括5G服務，而餘下的頻譜則預留作共用頻譜，在指定地點推行創新的5G應用。三家現有流動網絡營辦商於2019年4月各按其申請獲指配400兆赫非共用頻譜。機場管理局亦於2019年10月獲指配400兆赫的共用頻譜，用作創新的5G應用，以支援智能機場的發展。

協助撤銷大埔的「3.5吉赫限制區」

為了全面解決大埔限制區的問題，通訊辦一直與有關衞星營辦商商討，將他們位處大埔在3.5吉赫頻帶操作的遙測、追蹤及控制在軌持牌衞星的現有衞星地球站（遙測、追蹤及控制站）搬遷至春坎角電訊港，令流動網絡營辦商可在香港更廣泛地使用5G頻帶（包括3.5吉赫頻帶）提供5G服務。在通訊辦的協助下，其中一家衞星營辦商已獲撥地將其在大埔的遙測、追蹤及控制站遷往春坎角電訊港，而另一家營辦商亦正為此與相關政府部門商討有關撥地的條款，目前進展良好。

搬遷遙測、追蹤及控制站涉及複雜的土地及技術事宜，包括選址、批地、土地平整、建造工程和另建新一組的衞星天線，並要確保現有在軌衞星的操作不受影響。考慮到完成搬遷所需的時間和資源後，預計可在2024年年底前撤銷大埔「3.5吉赫限制區」。現時，流動網絡營辦商可利用其他新編配的頻帶（例如4.9吉赫頻帶）或透過重整現有頻譜（例如1.8吉赫及2.1吉赫頻帶）在「3.5吉赫限制區」提供5G服務。

Facilitating 5G Developments

Making Spectrum Available in Multiple Frequency Bands

The adoption of 5G technology will revolutionise mobile users' experience with cutting-edge technical capabilities for high speed, high capacity, high reliability, massive connectivity and low latency communications. It is widely expected that 5G will open up vast potential for various commercial and smart city applications such as smart surveillance, time-critical remote operation, telemedicine, and intelligent transportation.

In 2019, the CA assigned a total of 1 980 MHz of radio spectrum in the 3.3 GHz, 3.5 GHz, 4.9 GHz, and 26 GHz and 28 GHz bands in a timely manner for public mobile telecommunications use, including the provision of 5G services. MNOs launched their commercial 5G services in Hong Kong starting from 1 April 2020. As of March 2021, 5G coverage in Hong Kong had reached over 90% of the population, covering major shopping centres and more than 50 MTR stations.

Making Available Additional New 5G Spectrum to Meet the Demand of Operators

In order to meet the needs of various 5G applications in terms of speed, capacity and coverage, more spectrum in different frequency bands would be released to the market. OFCA provided support to the CA and the Secretary for Commerce and Economic Development (SCED) to launch joint public consultations in the third quarter of 2020, and to promulgate their decisions by way of joint statements on 30 March 2021 on the arrangements for frequency allocation and assignment for the spectrum in the 600 MHz, 700 MHz and 4.9 GHz bands as well as the related spectrum utilisation fee (SUF). Pursuant to the above decisions, a total of 220 MHz of new spectrum in the above three bands will be assigned by way of auction by the end of 2021.

Administrative Assignment of the Spectrum in the 26 GHz and 28 GHz Bands

In view of the ample supply of spectrum in the 26 GHz and 28 GHz bands, the CA has adopted an administrative approach for the assignment of spectrum in these bands. Among the 4 100 MHz of spectrum available, 3 700 MHz of spectrum has been set aside as non-shared spectrum for the provision of large scale public mobile services including 5G services while the rest has been set aside as shared spectrum for innovative 5G applications in specified locations. In April 2019, three incumbent MNOs were each assigned 400 MHz of the non-shared spectrum as per their applications. 400 MHz of shared spectrum was also assigned in October 2019 to the Airport Authority for innovative 5G applications in support of the smart airport development.

Facilitating the Removal of the "3.5 GHz Restriction Zone" in Tai Po

To fully resolve the issue of the "3.5 GHz restriction zone" in Tai Po, OFCA has been discussing with the concerned satellite operators the relocation of their earth stations for telemetry, tracking and control of the licensed satellites in orbit (TT&C stations) operating at the 3.5 GHz band from Tai Po to the Chung Hom Kok Teleport, so that MNOs can make wider use of all the available 5G bands (including the 3.5 GHz band) in Hong Kong for the provision of 5G services. With OFCA's assistance, one of the satellite operators has been allocated a land lot for relocation of its TT&C stations from Tai Po to the Chung Hom Kok Teleport, while the other operator is in good progress of discussion with the relevant government departments on the terms of possible land allocation for the same purpose.

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實施鼓勵及早使用5G技術資助計劃

通訊辦透過防疫抗疫基金於2020年5月推出「鼓勵及早使用5G技術資助計劃」，旨在透過提供財政誘因，鼓勵各界及早使用5G技術，推動創新和智慧城市的應用，從而改善營運效率和服務質素，以及提升香港的整體競爭力。在此計劃下，每個獲批的項目可獲資助與使用5G技術直接相關的實際開支的50%，上限為50萬元。

計劃自推出以來，反應十分踴躍。截至2021年8月31日，合共已有108份申請獲批，涵蓋不同行業，包括建築、設計、教育、環保、電競及休閒、活動及展覽、物流、醫療及保健、物業及設施管理、維修保養、市場營銷、電訊、紡織及交通運輸。

為了提升公眾對5G創新應用的認識，並展示計劃所取得的豐碩成果，通訊辦於2021年4月29日與香港生產力促進局合作舉辦了「迎接5G新世代—5G技術應用經驗分享會」。五家獲計劃資助的機構在會上分享其應用5G技術的項目，以及相關應用如何實質提升業務效率和帶來裨益。此外，四家流動網絡營辦商亦分享其5G應用解決方案和5G服務發展趨勢。親身出席或在線上參與分享會的人數超過300人。

為進一步鼓勵公私營機構利用5G技術促進持續創新，政府向計劃增加撥款，將總資助額由5,000萬元增至1億元，預計可惠及合共200個合資格項目，並已延長申請期至2022年7月31日。通訊辦會繼續支援計劃的運作。

實施擴展光纖網絡至偏遠地區鄉村資助計劃

為配合政府的政策，通訊辦現正推行一項獲撥款港幣7.7億元的資助計劃，透過提供經濟誘因鼓勵固網營辦商擴展光纖網絡至新界及離島九個地區共235條鄉村。該等鄉村遠離固網營辦商現有光纖主幹網，村民只可選用透過銅線網絡提供、速度只有每秒10兆比特或以下的寬頻服務。

通訊辦把該235條鄉村組合成六個投標項目（即投標項目一至投標項目六）進行招標。獲選的固網營辦商須鋪設光纖連接線路至相關鄉村的村口位置，以及鋪設三條海底光纖電纜，分別連接香港島至南丫島（投標項目五），及連接大嶼山至長洲和大嶼山至坪洲（投標項目六）。為引入市場競爭，獲選的固網營辦商須開放獲資助鋪設的網絡設施，以及海底光纖電纜至少一半的容量予其他固網營辦商免費使用。

通訊辦於2021年4月29日在香港生產力促進局協助下舉辦了「迎接5G新世代—5G技術應用經驗分享會」。

OFCA organised the "Embrace the New 5G Era – Experience-sharing Seminar on the Applications of 5G Technology" on 29 April 2021 in collaboration with the Hong Kong Productivity Council.

Relocation of the TT&C stations involves complex land and technical issues, including site selection, land grants, site formation, construction works and establishment of another set of satellite antennae, as well as the need to ensure that operation of the existing satellites in orbit will not be affected. Considering the lead time and effort required for completing the relocation exercise, it is expected that the "3.5 GHz restriction zone" in Tai Po can be removed before the end of 2024. Meanwhile, MNOs can make use of the other newly allocated frequency bands (e.g. the 4.9 GHz band) or re-farm the existing spectrum (e.g. the 1.8 GHz and 2.1 GHz bands) to provide 5G services in the "3.5 GHz restriction zones".

Implementation of the Subsidy Scheme for Encouraging Early Deployment of 5G

OFCA launched the "Subsidy Scheme for Encouraging Early Deployment of 5G" under the Anti-epidemic Fund in May 2020. The scheme aims to encourage various sectors, through the provision of financial incentives, to deploy 5G technology early in fostering innovation and smart city applications, and improving the efficiency of their operations and the quality of their services, which will contribute to enhancing Hong Kong's overall competitiveness. Under the scheme, each approved project will be subsidised for 50% of the actual cost directly relevant to the deployment of 5G technology, subject to a cap of HK$500,000.

Since its launch, the scheme has been well received with enthusiastic responses. As of 31 August 2021, a total of 108 applications had been approved, covering various sectors including construction, design, education, environmental protection, e-sports and recreation, event and exhibition, logistics, medical and healthcare, property and building facilities management, repair and maintenance, sales and marketing, telecommunications, textiles, and transport.

In order to raise public awareness of the innovative applications enabled by 5G and to showcase the fruitful accomplishment of the scheme, OFCA organised the "Embrace the New 5G Era – Experience-Sharing Seminar on the Applications of 5G Technology" on 29 April 2021 in collaboration with the Hong Kong Productivity Council. In the seminar, five of the grantees under the scheme shared their experience of how the deployment of 5G had improved their efficiency and brought substantive benefits to their business operations. The four MNOs also gave presentations of their 5G applications and solutions, as well as the latest 5G developments. More than 300 participants joined the seminar in person or online.

To further encourage the public and private sectors to deploy 5G technology and foster innovation, the Government has increased funding earmarked for the scheme from $50 million to $100 million, and this would support about 200 projects in total. The deadline for application has been extended to 31 July 2022, and OFCA will continue to provide support for operation of the scheme.

Implementation of the Subsidy Scheme to Extend Fibre-Based Networks to Villages in Remote Areas

In support of the Government's policy initiative, OFCA is implementing a subsidy scheme with a funding of HK$770 million to provide financial incentives for FNOs to extend their fibre-based networks to 235 villages across nine districts in the New Territories and outlying islands. These villages are located far away from the existing fibre-based backbone networks of FNOs, where villagers can only choose broadband services delivered over copper-based networks at a speed of 10 Mbps or below.

The 235 villages are grouped under six projects (namely, Project 1 to Project 6) for tendering purpose. Selected FNOs are required to roll out fibre-based lead-in connections to the vicinity of the entrances of the villages concerned, and roll out three submarine

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隨着計劃的六個投標項目在2019年11月至2020年5月期間悉數批出，獲選的固網營辦商已開展有關工作，並於2021年起分階段把光纖網絡擴展至有關鄉村。除了當地村民可以享用高速固網寬頻服務外，流動網絡營辦商亦可使用新網絡支援其流動網絡，在有關地區提供包括5G服務在內的高速和創新流動服務。

便利5G網絡鋪設

流動網絡營辦商在香港推展5G服務時，須設置比以往幾代流動服務更多的無線電基站。為便利5G網絡迅速和有效地鋪設，通訊辦於2019年3月推行先導計劃，開放超過1 000個合適的政府場所予流動網絡營辦商安裝無線電基站，並簡化相關的審批程序。通訊辦已成立專責小組，負責在有關事宜上協調流動網絡營辦商與相關政府部門，並發出《在先導計劃下於選定政府場地安裝無線電基站的申請須知》，闡釋該計劃下的相關原則、要求和經簡化的申請及審批程序。截至2021年8月，政府共收到158份根據該計劃提出的申請，並已批准當中的84份申請。為進一步推行便利5G網絡鋪設的政策措施，通訊辦將以「需求主導」的模式協助營辦商物色和進入更多合適的政府場所安裝無線電基站。

通訊辦亦一直與相關政府部門協調，以便利流動網絡營辦商於合適的街道裝置及公眾設施（例如公眾收費電話亭及有蓋巴士站）安裝無線電基站。我們分別於2020年4月及11月發出了《使用公眾收費電話亭安裝無線電基站以提供公共流動服務的指引》及《流動網絡營辦商使用有上蓋巴士站安裝無線電基站以提供公共流動服務的指引》，以便利業界使用公眾收費電話亭和有上蓋巴士站安裝無線電基站。通訊辦會繼續與業界及相關政府部門合作，物色其他適合設置無線電基站的街道裝置和公眾設施，以及便利營辦商進行技術測試。

為確保5G網絡在3.3吉赫及3.5吉赫頻帶內能有效率地運作，通訊辦向通訊局提供技術支援，並在諮詢所有流動網絡營辦商後，協助通訊局於2020年4月發出《以時分雙工模式於3.3－3.6吉赫頻帶運作的流動網絡制定幀結構的指引》。通訊辦會繼續在有需要時為業界提供技術指引，以促進香港有效推行5G網絡建設。

確保可適時供應合適的頻譜以應付新興無線電通訊服務的需要

通訊辦一直緊貼電訊業的全球發展趨勢，並參與國際電信聯盟（國際電聯）及亞太地區電信組織等相關組織舉辦的國際／地區會議。年內，通訊辦為統籌頻譜供應的工作成立了內部專責小組，以期早日展開頻譜策劃的工作並確保可適時釋放合適的頻譜，以應付創新無線電通訊服務的需求和便利公共流動（包括5G）服務的持續發展。經考慮通訊辦的建議後，通訊局公布了2021年至2023年的頻譜供應表，向業界公布未來三年擬供應作公共流動及／或其他無線電通訊服務用途的無線電頻譜。

fibre-based cables connecting Lamma Island from Hong Kong Island (under Project 5), as well as connecting Cheung Chau from Lantau Island and Peng Chau from Lantau Island (under Project 6). To introduce competition, selected FNOs are required to open up at least half of the capacity of the network facilities and submarine fibre-based cables subsidised under the scheme for use by other FNOs for free.

Following the award of all six tender projects under the scheme between November 2019 and May 2020, the selected FNOs have started their implementation work and are extending their fibre-based networks to the villages concerned in phases from 2021 onwards. Not only will the villagers concerned be able to enjoy high-speed fixed broadband services, but MNOs will also be able to make use of the new networks as backhaul for their mobile networks and provide high-speed and innovative mobile services including 5G services to the areas concerned.

Facilitating the Rollout of 5G Networks

For the deployment of 5G services in Hong Kong, MNOs are required to establish a larger number of radio base stations (RBSs) as compared with previous generations of mobile services. To facilitate the expedient and effective rollout of 5G networks, OFCA launched a pilot scheme in March 2019 to open up more than 1 000 suitable government premises for MNOs to install RBSs with a streamlined approval process. OFCA has set up a dedicated team to coordinate with MNOs and relevant government departments on the matters concerned, and issued the "Guidance Notes for Submission of Applications under the Pilot Scheme for Installation of Radio Base Stations at Selected Government Venues" to set out the principles, requirements and streamlined procedures in respect of the applications under the scheme. As of August 2021, 158 applications had been received under the scheme, of which 84 were approved. As a further policy initiative to facilitate the 5G network rollout, OFCA will assist operators under a "demand-led" model to identify and gain access to additional suitable government premises for installation of RBSs.

OFCA has also been coordinating with the relevant government departments to facilitate MNOs' access to suitable street furniture and public facilities such as public payphone kiosks and sheltered bus stops for the installation of RBSs. We issued the "Guidelines on the Use of Public Payphone Kiosks for the Installation of Radio Base Stations for Provision of Public Mobile Services" and the "Guidelines on the Use of Sheltered Bus Stops for the Installation of Radio Base Stations for Provision of Public Mobile Services" in April and November 2020 respectively to facilitate the industry's use of the public payphone kiosks and sheltered bus stops for installation of RBSs. OFCA will continue to work with the industry and the relevant government departments in identifying other suitable street furniture and public facilities for installation of RBSs and facilitating technical trials.

In order to ensure efficient operation of 5G networks in the 3.3 GHz and 3.5 GHz bands, having consulted all MNOs, OFCA provided technical support to the CA in issuing the "Guidelines for Setting the Frame Structure of Mobile Networks Operating in Time-Division-Duplex Mode in the 3.3 – 3.6 GHz Band" in April 2020. OFCA will continue to provide technical guidance to the industry as necessary to facilitate effective implementation of 5G networks in Hong Kong.

Ensuring Timely Supply of Suitable Spectrum to Meet the Needs of Emerging New Radiocommunications Services

OFCA keeps up with worldwide development trends in telecommunications and participates in related international/regional meetings of the International Telecommunication Union and Asia-Pacific Telecommunity, among others. During the year, OFCA set up an in-house task force on spectrum supply to collate efforts with a view to conducting early spectrum planning work and ensuring timely release of suitable spectrum to meet the demands of emerging new radiocommunications services and facilitate the ongoing development of public mobile (including 5G)

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實施衞星電視共用天線系統升級資助計劃

自從3.4－3.7吉赫頻帶從2020年4月1日開始由固定衞星服務重新編配予流動服務，以提供5G服務，所有安裝在大廈內用以接收和分發衞星電視訊號給住戶的衞星電視共用天線系統此後只可在3.7－4.2吉赫頻帶內操作。衞星電視共用天線系統須進行相關技術升級，方可於2020年4月1日後與在相鄰的3.4－3.6吉赫頻帶內操作的5G系統並存。

為支援衞星電視共用天線系統進行升級，四家使用3.4－3.6吉赫頻帶提供5G服務的流動網絡營辦商籌集經費港幣3,200萬元成立一項資助計劃，以資助衞星電視共用天線系統擁有人進行系統升級的費用，並共同委任通訊辦代為管理該計劃。每名成功申請人獲發港幣兩萬元的一次性資助，為相關衞星電視共用天線系統進行升級。資助計劃已於2019年11月27日推出，並在運作一年後於2020年11月26日結束。該計劃成功處理合共1 039宗申請，已發放的資助金額為港幣2,078萬元。計劃結束後，剩餘的經費已經退還予四家流動網絡營辦商。

促進無線物聯網服務和地區性無線寬頻服務的發展

通訊局在2017年12月就使用920－925兆赫共用頻帶提供無線物聯網平台及服務設立了新牌照制度，至今已發出三個無線物聯網牌照。此外，現有流動網絡營辦商亦可使用根據綜合傳送者牌照指配的頻譜，採用支援大量物聯網連接的流動技術（例如窄頻帶物聯網和5G技術）提供無線物聯網服務。通訊辦會繼續協助通訊局促進無線物聯網服務在香港的發展及具競爭性的供應。

通訊辦於2019年7月設立地區性無線寬頻服務牌照，以按地區劃分的共用模式，讓業界使用27.95－28.35吉赫內的400兆赫頻譜提供創新無線寬頻服務。通訊辦已於2019年10月發出首個地區性無線寬頻服務牌照，此後亦會處理該牌照的新申請，以促進在大學校園、工業邨和科技園等不同地點發展創新的5G和智慧城市應用。通訊辦會繼續協助通訊局更新該牌照制度，以配合市場發展，例如應對不同行業及機構在局部地區營運小規模專用5G系統的潛在需求。

services. Taking into account OFCA's recommendations, the CA issued the Spectrum Release Plan for 2021 – 2023 to inform the industry of the potential supply of spectrum for provision of public mobile and/or other radiocommunications services in the coming three years.

Implementing the Subsidy Scheme for Upgrading Satellite Master Antenna Television Systems

Following the re-allocation of the 3.4 – 3.7 GHz band from fixed satellite service to mobile service from 1 April 2020 for the provision of 5G services, all Satellite Master Antenna Television (SMATV) systems installed in buildings for receiving and distributing satellite television signals to serve occupants should only operate in the 3.7 – 4.2 GHz band. Relevant technical upgrades of SMATV systems should be implemented in order to co-exist with 5G systems operating in the adjacent 3.4 – 3.6 GHz band after 1 April 2020.

To support the upgrade of SMATV systems, the four MNOs using the 3.4 – 3.6 GHz band for provision of 5G services collectively contributed HK$32,000,000 to establish a subsidy scheme for funding the cost of the upgrade by owners of SMATV systems, and the MNOs jointly appointed OFCA to administer the scheme on their behalf. Each successful applicant would be granted with a one-off subsidy of HK$20,000 for upgrading the SMATV system concerned. The subsidy scheme started on 27 November 2019, and was closed on 26 November 2020 after one year of operation. A total of 1 039 applications were successfully processed and HK$20,780,000 was disbursed. Following the completion of the scheme, the remaining fund was returned to the four MNOs.

Facilitating Development of Wireless Internet of Things Services and Localised Wireless Broadband Services

Since the creation of a new licensing regime by the CA in December 2017 for the provision of Wireless Internet of Things (WIoT) platforms and services using the shared frequency band of 920 – 925 MHz, three WIoT licences have been issued. In addition, the existing MNOs may also make use of the frequency spectrum assigned to them under the Unified Carrier Licence to provide WIoT services by adopting mobile technologies such as Narrowband Internet of Things (IoT) and 5G technologies that enable massive IoT connections. OFCA will continue to support the CA to facilitate the development and competitive supply of WIoT services in Hong Kong.

The Localised Wireless Broadband Service (LWBS) Licence was created in July 2019 to enable the use of 400 MHz of spectrum in the frequency range of 27.95 – 28.35 GHz on a geographically shared basis for the provision of innovative wireless broadband services. Following the issue of the first LWBS Licence in October 2019, OFCA will process any new LWBS licence applications to facilitate the development of innovative 5G and smart city applications at different locations, such as university campuses, industrial estates and technology parks. OFCA will continue to support the CA in updating the licensing regime to cater for market development such as addressing potential demand for the operation of smaller scale 5G private systems by different industries and entities in localised areas.

3 迎接電訊市場新挑戰
Meeting the New Challenges of the Telecommunications Market

落實重新指配在900兆赫及1800兆赫頻帶內的頻譜

2021年1月12日，900兆赫頻帶內有50兆赫頻譜在之前的指配期屆滿後，隨即展開為期15年的新指配期。由於900兆赫頻帶內的部分頻譜會於重新指配後易手，通訊辦早於2019年5月成立由全部四家流動網絡營辦商代表組成的技術工作小組，以協調營辦商重新配置現有網絡及／或鋪設新網絡基礎建設的相關技術安排。通過技術工作小組的努力，900兆赫頻帶內的頻譜已於2021年1月12日順利移交至新受配者。

1800兆赫頻帶內的150兆赫頻譜的現有指配期則將於2021年9月屆滿。四家現有流動網絡營辦商將通過行政方式各獲重新指配1800兆赫頻帶內20兆赫的頻譜，而餘下的70兆赫頻譜則會按照2018年12月的拍賣結果重新指配予該四家營辦商。一如重新指配900兆赫頻帶內頻譜的安排，部分在1800兆赫頻帶內的頻譜將會於2021年9月30日為期15年的新指配期開始時易手。通訊辦會繼續與業界緊密合作，以確保1800兆赫頻帶內的頻譜可於2021年9月順利交接。

為重新指配850兆赫及2.5／2.6吉赫頻帶內的頻譜作準備

2.5／2.6吉赫頻帶內的90兆赫頻譜的現有指配期將於2024年3月屆滿。此外，850兆赫頻帶內15兆赫頻譜的指配期原訂於2023年11月屆滿，其現有受配者獲通訊局批准提早交還該頻譜。該受配者在完成所需的停用工作後，已於2021年6月交還有關頻譜。經2020年第三季進行的公眾諮詢後，通訊局聯同商經局局長在2021年3月30日公布850兆赫和2.5／2.6吉赫頻帶內的頻譜在現有指配期屆滿後的重新指配安排及相關頻譜使用費。通訊辦會協助通訊局落實有關決定，在2021年第四季以單次拍賣方式重新指配850兆赫及2.5／2.6吉赫頻帶內的105兆赫頻譜，以及指配600兆赫、700兆赫及4.9吉赫頻帶內的220兆赫新頻譜。

政府進行電訊規管架構檢討

在通訊辦的協助下，商務及經濟發展局完成對《電訊條例》下有關電訊規管架構的檢討，以配合5G及物聯網科技的發展，並便利業界營商。《2021年電訊（修訂）條例草案》已於2021年7月提交立法會，以修訂《電訊條例》相關條文，落實有關檢討的建議。同時，通訊辦亦推出各種精簡措施，以進一步便利業界營運。

落實電話智能卡實名登記制

政府於2021年1月30日至3月20日期間就實名登記制進行公眾諮詢，實名登記制普遍獲各持份者支持。為落實執行實名登記制，政府根據《電訊條例》第37條訂立《電訊（登記用戶識別卡）規例》，由2021年9月1日起生效。

Implementation of the Re-assignment of Frequency Spectrum in the 900 MHz and 1800 MHz Bands

On 12 January 2021, a new 15-year term of assignment commenced for 50 MHz of spectrum in the 900 MHz band upon expiry of the previous term. As some of the spectrum in the 900 MHz band would change hands upon re-assignment, OFCA convened a technical working group as early as May 2019 comprising representatives of all four MNOs to coordinate the relevant technical arrangements to reconfigure their existing networks and/or roll out additional network infrastructures. Through the efforts of the technical working group, the spectrum in the 900 MHz band was smoothly handed over to the new assignees on 12 January 2021.

The current assignments of 150 MHz of spectrum in the 1800 MHz band will expire in September 2021. While 20 MHz of spectrum in the 1800 MHz band will be re-assigned administratively to each of the four incumbent MNOs, the remaining 70 MHz of spectrum will be re-assigned to the four operators pursuant to the results of the auction in December 2018. Similar to the re-assignment of the spectrum in the 900 MHz band, some of the frequency assignments in the 1800 MHz band will change hands upon commencement of the new 15-year assignment term on 30 September 2021. OFCA will continue to work closely with the industry to ensure a smooth change-over of spectrum in the 1800 MHz band in September 2021.

Preparing for Re-assignment of Frequency Spectrum in the 850 MHz and 2.5/2.6 GHz Bands

The current assignment of 90 MHz of spectrum in the 2.5/2.6 GHz bands will expire in March 2024. Separately, the existing assignee of 15 MHz of spectrum in the 850 MHz band, the assignment of which is due to expire in November 2023, obtained CA's approval for early return of the concerned spectrum and it returned the spectrum in June 2021 after completing the necessary decommissioning work. After the public consultations in the third quarter of 2020, the CA and SCED announced on 30 March 2021 the arrangements for re-assignment of the spectrum in the 850 MHz and 2.5/2.6 GHz bands upon expiry of the existing assignments and the related SUF. OFCA will assist the CA in implementing the decisions to re-assign the 105 MHz of spectrum in the 850 MHz and 2.5/2.6 GHz bands, together with 220 MHz of new spectrum in the 600 MHz, 700 MHz and 4.9 GHz bands, by way of a single auction in the fourth quarter of 2021.

Review of the Telecommunications Regulatory Framework by the Government

With OFCA's support, the Commerce and Economic Development Bureau completed the review of the telecommunications regulatory framework under the Telecommunications Ordinance (TO) with a view to embracing the developments of 5G and IoT technologies and facilitating the trade. The Telecommunications (Amendment) Bill 2021, which sought to amend relevant provisions of the TO to implement the review proposals was introduced into the Legislative Council in July 2021. In parallel, OFCA also introduced various streamlined measures with the aim of further facilitating the operation of the industry.

Implementation of Real-name Registration for SIM Cards

The Government conducted a public consultation on the Real-name Registration Programme for SIM cards (Real-name Registration Programme) from 30 January to 20 March 2021. The Real-name Registration Programme was generally supported by various stakeholders. To implement the Real-name Registration Programme, the Telecommunications (Registration of SIM Cards) Regulation was made under section 37 of the TO with the effective date on 1 September 2021.

3 迎接電訊市場新挑戰
Meeting the New Challenges of the Telecommunications Market

通訊辦協助通訊局擬備指引，為於香港以電話智能卡提供電訊服務的持牌人提供實務和行政指引，以履行《登記規例》下的登記規定。通訊辦協助通訊局諮詢業界後，通訊局於2021年8月發出有關指引。該指引在2021年9月1日於實名登記制展開時同時生效。通訊辦亦會繼續協助通訊局監察實名登記制的實施，確保能根據《登記規例》及指引運作和推行。

完善要約提供電訊服務類別牌照登記制度

要約提供電訊服務類別牌照（類別牌照）旨在規管在沒有設置任何電訊設備的情況下向公眾要約提供電訊服務的人士。根據《管理要約提供電訊服務類別牌照的指引》（《類別牌照指引》）過去的版本，只有付費客戶的數量達10 000或以上的類別牌照持有人才須向通訊局登記。在實名登記制實施後，通訊辦協助通訊局更新《類別牌照指引》，要求所有在業務運作中要約提供相關智能卡服務的類別牌照持有人，不論客戶數量多寡，均須於2021年9月1日《登記規例》生效前向通訊局登記其資料。截至2021年9月1日，21名在業務運作中要約提供相關智能卡服務的類別牌照持有人已完成登記。通訊辦會繼續協助通訊局確保優化後的類別牌照登記制度運作暢順。

推行緊急警示系統以迅速發放緊急政府訊息

在防疫抗疫基金下，政府委聘四家本地流動網絡營辦商設立緊急警示系統，讓政府可在緊急情況下（例如不可預見的極端天氣情況）透過流動網絡營辦商的流動網絡發出緊急訊息，提醒市民盡快採取應變措施。流動網絡營辦商在網絡設置、測試和推行緊急警示系統的各個階段中，均須遵循通訊辦為其制訂的技術規格及測試計劃。此外，通訊辦向手機供應商／製造商發出規管性指引，列出供應本港的手機的功能規定，以便供港手機可妥為接收及顯示緊急警示訊息。政府已於2020年11月26日推出緊急警示系統，通訊辦會繼續監察流動網絡營辦商在運作及維護緊急警示系統方面的工作，並在有需要時協助政府通過有關系統發放緊急訊息。

完善服務營辦商發牌制度

通訊辦協助通訊局完善服務營辦商的發牌制度，包括把服務營辦商牌照的有效期由一年延長至兩年，以加強規管的確定性；精簡服務營辦商牌照所授權提供服務的類別；以及採用新的牌照費架構，以確保在服務營辦商牌照內施加的規管措施與其他牌照一致。上述措施由2020年8月起生效。通訊辦會繼續協助通訊局確保優化後的發牌制度得以順利運作。

OFCA assisted CA in preparing guidelines to provide practical and administrative guidance to licensees supplying telecommunications services through SIM cards in Hong Kong in compliance with the registration requirements under the Registration Regulation. Following OFCA's consultation with the telecommunications industry, the CA issued the guidelines in August 2021, which took effect upon commencement of the Real-name Registration Programme on 1 September 2021. OFCA will continue to assist the CA to oversee the operation and implementation of the Real-name Registration Programme in accordance with the Registration Regulation and the guidelines.

Enhancement of the Registration System for Class Licence for Offer of Telecommunications Services

The Class Licence for Offer of Telecommunications Services (CLOTS) regulates persons who offer telecommunications services to the general public without the establishment of any means of telecommunications. Under the previous version of the Guidelines for Administration of CLOTS (CLOTS Guidelines), only CLOTS licensees with a customer base of 10 000 subscriptions or more were required to register with the CA. With the implementation of the Real-name Registration Programme, OFCA assisted the CA to update the CLOTS Guidelines to require all CLOTS licensees offering relevant SIM services during the course of business, irrespective of the size of their customer base to register their information with the CA before the Registration Regulation came into operation on 1 September 2021. As of 1 September 2021, 21 CLOTS licensees offering relevant SIM services in the course of business had been registered. OFCA will continue to assist the CA to ensure smooth operation of the enhanced registration system for CLOTS.

Implementation of the Emergency Alert System for Prompt Dissemination of Time-Critical Messages of the Government

As an initiative under the Anti-epidemic Fund, the Government engaged the four local MNOs to set up an EAS, enabling the Government to send time-critical messages via the MNOs' mobile networks to alert the public to take contingency measures as soon as possible during emergency situations, such as unforeseen extreme weather conditions. OFCA formulated technical specifications and test plans for the MNOs to follow in the stages of establishment, testing and implementation of the EAS on their networks. In addition, OFCA issued a regulatory guide for mobile handset suppliers/manufacturers setting out the functional requirements on mobile handsets supplied to Hong Kong such that they would be able to properly receive and display EAS messages. The Government launched the EAS on 26 November 2020. OFCA will continue to monitor MNOs' operation and maintenance of the EAS, and assist in disseminating the Government's emergency messages via the EAS as necessary.

Enhancement of Licensing Regime for Services-Based Operators

OFCA supported the CA to enhance the Services-Based Operators (SBO) licensing regime by extending the period of validity of the SBO Licence from one year to two years to enhance regulatory certainty, streamlining the categories of services authorised under the SBO Licence, and adopting a new licence fee structure to ensure regulatory symmetry between the SBO Licence and other licences. The above enhancements took effect from August 2020. OFCA will continue to assist the CA to ensure smooth operation of the enhanced licensing regime.

3 迎接電訊市場新挑戰
Meeting the New Challenges of the Telecommunications Market

處理流動網絡營辦商逐步終止2G服務的申請

通訊辦接獲部分流動網絡營辦商申請要求通訊局批准其在2021年下半年停止提供2G服務。根據相關發牌條件，流動網絡營辦商必須令通訊局信納受影響的客戶得到妥善及適當的安排，方可停止提供某一代的流動服務。通訊辦協助通訊局審批流動網絡營辦商的申請，以確保這些流動網絡營辦商在停止提供2G服務前，已為其2G客戶作出妥善的安排。

簡化規管方式

通訊辦一直協助通訊局維持有效的規管制度便利電訊業的商業運作，並推出多項緊貼電訊科技發展並有助提升運作效率的簡化措施。鑑於市場競爭激烈和價格具透明度，通訊辦協助通訊局移除將持牌人收費呈交通訊局存檔的牌照規定，以及簡化向用戶公布收費的要求。為減輕業界的合規成本並確保市場具透明度和符合國際貿易的要求，通訊辦協助通訊局簡化根據《電訊條例》第36A條將互連協議送交通訊局存檔及公布的規定，即只有涉及新種類或新元素互連的互連協議才須送交通訊局存檔。此外，通訊辦亦根據最新的市場環境對準確按時計帳計劃作出檢討，並考慮到其他能有效解決按時計帳問題的現行規管措施，決定於2021年1月停止該計劃，以減省不必要的規管和締造更有利於營商的環境。通訊辦會繼續協助通訊局檢討和簡化規管方式，確保該等措施能切合市場發展和與時並進。

檢討根據全面服務責任提供的公眾收費電話機數目

公眾收費電話機服務是基礎電話服務之一，由全面服務供應商按其全面服務責任提供。在全面服務責任下提供公眾收費電話機服務所需的成本，由固定及流動服務營辦商分擔。鑑於對公眾收費電話機服務的需求近年持續減少，通訊辦協助通訊局於2017年至2019年期間進行檢討，以決定在全面服務責任下的公眾收費電話機的合理數目。

就室內公眾收費電話機而言，通訊局決定從全面服務責任中剔除515個電話機（約佔室內公眾收費電話機總數的35%）。全面服務供應商已將所有被剔除的室內公眾收費電話機移除。另外，通訊局決定從全面服務責任中剔除765個電話亭公眾收費電話機（約佔電話亭公眾收費電話機總數的50%）。截至2021年3月，超過87%被剔除的電話亭公眾收費電話機已經被移除。

固網寬頻服務的發展

隨着固網營辦商持續鋪設網絡，香港市民得以享用近乎覆蓋全港並採用各種技術提供的寬頻服務。截至2021年3月，香港約有290萬住宅及商業固網寬頻用戶，住戶滲透率為95%。目前寬頻服務的速度可高達每秒10吉比特。大約84%的固網寬頻用戶使用速度達每秒100兆比特或以上的寬頻服務。

根據歐洲光纖到戶議會於2019年3月發出的報告，香港住戶連接光纖到戶／光纖到樓的滲透率在全球64個經濟體系中排名第六。

Consideration of Applications for Phasing Out of 2G Services by Mobile Network Operators

OFCA has received applications from some MNOs to seek the CA's approval to cease their provision of 2G services in the second half of 2021. Under the relevant licence condition, MNOs are required to make proper and appropriate arrangements for the affected customers to the satisfaction of the CA before ceasing to provide a generation of mobile service. OFCA assists the CA in vetting the MNOs' applications to ensure that the 2G customers of these MNOs would be well taken care of before they cease provision of 2G services.

Streamlining of Regulatory Practices

As part of the ongoing effort to maintain an effective regulatory regime conducive to the business operation of the telecommunications industry, OFCA supported the CA to introduce a number of streamlining measures to keep up with the advancement of telecommunications technologies and help enhance operational efficiency. Among others, in view of the intense competition and price transparency in the market, OFCA supported the CA to remove the licence requirement of submitting tariffs to the CA for filing and streamlined the requirement on publishing tariffs for information to customers. To reduce the industry's compliance cost while ensuring market transparency and fulfilment of international trade requirements, OFCA assisted the CA to streamline the requirement on filing and publication of interconnection agreements under section 36A of the TO, where only the interconnection agreements involving new types or elements of interconnection would need to be filed with the CA. Furthermore, having reviewed the Billing and Metering Integrity Scheme (BMIS) under the latest market environment and having regard to other regulatory measures already in place which are effective in addressing billing and metering issues, it was decided to abolish the BMIS in January 2021, with a view to eliminating unnecessary regulation and fostering a more business-friendly environment.

OFCA will continue to assist the CA to review and streamline regulatory practices to ensure that they remain relevant and in line with the latest market situation.

Review of the Number of Public Payphones under the Universal Service Obligation

Public payphone service is a form of basic telephone service which the universal service provider (USP) is required to provide under its universal service obligation (USO). The cost of providing a public payphone service subject to the USO is shared by the fixed and mobile services operators. In view of the diminishing demand for public payphone service in recent years, OFCA supported the CA to conduct a review of the reasonable number of public payphones that should be subject to the USO from 2017 to 2019.

For in-building type public payphones, the CA decided to exclude 515 in-building type public payphones (about 35% of the total number of in-building type public payphones) from the USO. All the excluded in-building type public payphones have been removed by the USP. For kiosk type public payphones, the CA decided to exclude 765 kiosk type public payphones (about 50% of the total number of kiosk type public payphones) from the USO. As of March 2021, over 87% of the excluded kiosk type public payphones had been dismantled.

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新的海底電纜系統在香港登陸

在通訊辦提供的綜合聯絡服務的協助下，多個新的區域或洲際海底電纜系統和四個本地海底電纜系統正在興建中，並擬於2021年至2023年間投入服務。通訊辦將繼續協助營辦商申請新的海底電纜系統在香港興建及登陸所需的法定許可。

檢討用作電話機樓及其他電訊相關設施的批地使用情況

政府批予電訊營辦商用作設置和營運電話機樓及其他電訊相關設施的42幅批地契約將於2025年屆滿。為協助政府考慮現行地契年期屆滿後處理該等用地的未來路向，通訊辦委聘顧問公司進行研究，以檢討現時該等用地的使用情況。通訊辦會繼續就此事從電訊政策的角度向政府提供支援和意見。

香港衞星網絡的發展

衞星頻譜和軌道位置屬珍貴天然資源。在香港註冊的通訊衞星在使用該等資源時須符合國際電聯的協調及通知規定。就此，通訊辦支援香港持牌衞星營辦商不時與外國當局協調，並協助處理有關操作在軌衞星的牌照事宜。現時共有十枚在軌衞星由香港兩家提供衞星通訊服務的持牌公司操作。

協助在春坎角電訊港配置土地以建設對外電訊設施

為加強香港作為區域電訊樞紐的角色，並滿足香港在對外電訊設施方面日益殷切的需求，通訊辦會協助在春坎角電訊港提供合適土地，供建設對外電訊基建設施之用，以期進一步提升香港對外電訊網絡的整體容量和分流能力。

春坎角電訊港有關土地的招標準備工作現正進行中。通訊辦正與相關政策局及部門緊密合作，務求在未來數年提供有關土地以建設對外電訊設施。

Development of Fixed Broadband Services

With the continuous network rollout of FNOs, the Hong Kong community can enjoy nearly ubiquitous coverage of broadband networks deploying various technologies. As of March 2021, there were around 2.9 million residential and commercial fixed-broadband subscriptions, with a household penetration rate of 95%. Broadband services are now available at speeds of up to 10 Gbps. Around 84% of the fixed broadband subscriptions are supported by broadband services with speeds of 100 Mbps or above.

According to a report issued by the Fibre to the Home Council Europe in March 2019, Hong Kong was ranked sixth worldwide in fibre to home/building household penetration among the 64 economies under comparison.

Landing of New Submarine Cable Systems in Hong Kong

With the support of OFCA's single-point-of-contact service, several new regional or transcontinental submarine cable systems, as well as four domestic systems are under construction and scheduled to be put into service between 2021 and 2023. OFCA will continue to assist operators in applying for the necessary statutory approvals for the construction and landing of new submarine cable systems in Hong Kong.

Facilitating the Disposal of Land Lots in Chung Hom Kok Teleport for Construction of External Telecommunications Facilities

In order to reinforce Hong Kong's role as a regional telecommunications hub and meet the growing demand for external telecommunications facilities in Hong Kong, OFCA will help provide suitable land lots in the Chung Hom Kok Teleport for external telecommunications infrastructure, aiming to further enhance the overall capacity and diversity of Hong Kong's external telecommunications networks.

Preparatory work for tendering of the relevant land lots in the Chung Hom Kok Teleport is in progress. OFCA is closely working with the relevant bureaux and departments to make the relevant land lots available for the construction of external telecommunications facilities in the coming few years.

Review of the Use of the Sites Granted for Telephone Exchanges and Other Telecommunications-Related Facilities

The land leases of 42 sites granted to telecommunications operators for establishing and operating telephone exchanges and other telecommunications-related facilities will expire in 2025. To facilitate the Government's consideration of the way forward for handling these sites upon lease expiry, OFCA commissioned a consultancy study to review the current use of these sites. OFCA will continue to provide support and advice to the Government on the matter from the telecommunications perspective.

Development of Hong Kong's Satellite Networks

Satellite spectrum and orbital positions are scarce natural resources. The use of these resources by communications satellites registered in Hong Kong should comply with the coordination and notification requirements of the International Telecommunication Union (ITU). In this regard, OFCA supports the licensed satellite operators of Hong Kong to coordinate with foreign administrations from time to time, and assists in the processing of licences for the operation of satellites in space orbits. There are now ten satellites in orbit operated by two Hong Kong companies licensed to provide satellite communications services.

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制訂和執行電訊標準

通訊辦密切監察電訊技術標準化的國際發展趨勢，並更新本地技術標準，以滿足業界和公眾需要。在2020／21年度，通訊局經諮詢無線電頻譜及技術標準諮詢委員會後，批准和發出了兩項涵蓋多標準無線電基站（包括5G基站）的新訂技術標準，以及四項涵蓋5G基站和用戶電訊設備的用戶設備及電氣保護規定的經修訂技術標準。

現時，合資格的本地和海外測試實驗室根據通訊局訂定的技術標準為各種電訊設備提供測試和驗證服務，而獲通訊局認可為本地認證機構的本地實驗室更可提供全面的電訊設備測試和驗證服務。在2020／21年度，本地和海外認證機構簽發了584份設備認證，以應付電訊設備市場需求。

為確保所有提供電訊設備測試和驗證服務的本地認證機構符合通訊辦規定的服務質素及表現標準，通訊辦會繼續密切監察認證機構的表現，包括定期查核文件、視察實驗場所和檢查他們的工作。目前，所有本地認證機構的表現均符合通訊辦訂明的要求。

Setting and Enforcing Telecommunications Standards

OFCA closely monitors international developments in telecommunications standardisation and updates local technical standards in order to meet the needs of the industry and the public. In 2020/21, two new technical standards covering multi-standard RBSs (including 5G base stations) and four revised technical standards covering 5G base stations and user equipment and electrical protection requirements for subscriber telecommunications equipment were approved and issued by the CA after consulting the Radio Spectrum and Technical Standards Advisory Committee.

Qualified local and overseas testing laboratories are now providing testing and certification services for various kinds of telecommunications equipment against technical standards prescribed by the CA. In particular, local laboratories accredited by the CA as local certification bodies (LCBs) offer a full range of telecommunications equipment testing and certification services. In 2020/21, LCBs and foreign certification bodies issued 584 equipment certificates to meet the needs of the telecommunications equipment market.

To ensure that all LCBs providing telecommunications equipment testing and certification services meet the service quality and performance standards required by OFCA, OFCA will continue to closely monitor their performance by regularly conducting documentary checks, plant visits and reviews. So far, all LCBs have been performing up to the requirements set by OFCA.