By Post & By Email:
panel_itb@legco.gov.hk

Date: 15 January 2021

Dr. Hon Junius HO Kwan-yiu, JP
Chairman
Panel on Information Technology and Broadcasting
Legislative Council
Legislative Council Complex,
1 Legislative Council Road,
Central, Hong Kong

Dear Sir

Re: Panel on Information Technology and Broadcasting Invitation for Written Submission

We refer to your letter dated 14 December 2020 captioned Panel on Information Technology and Broadcasting Invitation for Written Submission. We now submit our Company's reply in response to the invitation for views on 5G development in Hong Kong including the infrastructure requirements, legislative framework, policies, related institutional support, and any other issues of relevance.

1. Introduction

China Mobile Hong Kong Company Limited ("**CMHK**") had successfully launched its 5G service on 1 April 2020. It marked Hong Kong's transition from 4G to 5G, a generation of mobile communication characterized by its high speed, low latency communications, and support for massive numbers of Internet of Things ("**IoT**") devices. As one of Hong Kong's four mobile network operators ("**MNOs**"), we incorporate our analysis of the difficulties currently faced in 5G development contrasted against the potential 5G developmental direction so as to provide corresponding

suggestions in assisting the Government to propel an efficient growth of Hong Kong's 5G telecommunication.

2. Main Difficulties

There are four main difficulties faced by CMHK: (i) high construction and operational costs, (ii) difficulty in accessing and acquiring site resources, (iii) lack of synergy of 5G-related technological innovation, (iv) lack of 5G-oriented industrial integration development system.

(i) High construction and operational costs

MNOs suffer from substantial financial pressure with a significant increase in operational costs incurred by the high prices in the construction of new and upgrade of existing Radio Base Stations ("**RBS**s"), high rental cost of RBS, high electricity consumption of 5G equipment, and high spectrum utilization fee ("**SUF**").

Regarding the high electricity consumption, CMHK has sampled 150 RBSs and compared the electricity charges of March 2019 with March 2020. By analyzing the average usage readings from 90 CLP meters and 56 HK Electric meters (Table 1), the activation of one 5G network at the 3.5GHz spectrum alone incurred a 40% increase in electricity charges. Although the Government proposed in the 2020/2021 Budget a 75% electricity charges subsidy to non-residential users, with only 4 months of subsidized period, the effect of easing the pressure of daily operation is unfortunately vastly inadequate.

	Electricity Consumption (Unit)	**Electricity Charges (HK$)**
CLP	+35.99%	+39.78%
HK Electric	+42.76%	+48.56%

Table 1: Comparison between CLP and HKE's March 2019 and 2020 electricity charges

Internally, apart from the high electricity consumption and the financial burden of constructing the 5G infrastructure; externally, we also face the double financial burden of high spectrum acquisition price in the auctions and a SUF. It imposes an extremely unfavorable condition on MNOs for the development of 5G.

(ii) Difficulty in Accessing and Acquiring Site Resources

The application process of RBS construction is set back by the lengthy approval process from the Government Property Agency, Housing Authority, and THE LINK, which dampen the enthusiasm of MNOs to build and operate 5G networks. There is also difficulty in accessing premises for constructing RBSs or in installing equipment and antennas. Furthermore, it is not unusual that CMHK meets with difficulties when setting up RBSs in villages.

(iii) Lack of Synergy of 5G-Related Technological Innovation

There is an apparent lack of communication with different stakeholders about 5G's important role in formulating long-term technological innovation policies and supporting Smart City development plan.

(iv) Lack of 5G-oriented Industrial Integration Development System

Mobile applications based on Machine to Machine ("M2M") communication is an important element in constructing a Smart City. The Government has not yet devised clear policy and regulatory support to guarantee mobile telecommunication development.

3. Recommendations

Based on the abovementioned difficulties, we propose the following

recommendations in accordance with the 5 categories of infrastructure requirements, legislative framework, policies, related institutional support, and other issues of relevance.

3.1 Infrastructure Requirements

(i) Opening up more Government premises

Building a comprehensive 5G network coverage requires more site resources than its 4G counterpart. Since there's no specific office at the Lands Department, Housing Department, or Government Property Agency to uniformly manage this issue, MNOs face difficulty when acquiring radio site resources. Although the Office of Communications Authority ("**OFCA**") introduced "One-Stop Application Procedure for Installation of Radio Base Stations by Mobile Services Operators" and launched a pilot scheme in March 2019 to open up more than 1000 suitable Government premises for MNOs to install RBSs with streamlined applications and nominal rent, the approval and processing time remains long. Each site may require more than half a year to be approved. It would be conducive to MNOs if the Government could review the existing workflow to further streamline the reviewing and processing time of existing schemes, open up more Government premises like Government offices, schools, hospitals, and public premises free of charge, as well as provide resources like cable ducting, equipment rooms, and electricity to facilitate 5G infrastructure development and maintenance. The Government could draw reference from the Ministry of Science and ICT from the South Korean Government for providing MNOs with greater access to local government-owned premises like streetlamps and traffic facilities for MNOs to install 5G RBS, equipment, and antennas. The significant result is that the number of 5G-installed RBS surged from 8,500 at the end of 2018 to 85,0000 by April 2019.[1]

Through collecting and analyzing relevant data, OFCA could have the power to map out which areas require network coverage improvement and which areas could be used to install such 5G RBSs. As a fellow Government department, OFCA could also consider setting up a Task Force to centralize distributing Government properties' site

[1] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote24

resources by liaising with fellow Government departments on the issue of allocating site resources, so as to drive the City's 5G development forward constructively. In particular, the Government could refer to other countries regarding the creation of a Task Force. For instance, the Task Force co-operated by three MNOs, the Nation 5G Task Force of the Malaysian Communications and Multimedia Commission in Malaysia[2], the Government in South Korea[3], and the Task Force from the United Kingdom ("**UK**")[4]. Furthermore, it is suggested that the Government of HKSAR may open up more governmental collected data and city planning to facilitate 5G planning.

Further, apart from shortening the reviewing and processing time of site applications and setting up a Task Force, there should also be an added clause in the Government's subsidies for private domestic units' maintenance, requiring the subsidized building unit to provide appropriate locations for MNOs to install their RBSs. Relevant authorities could also consider inserting a clause to compel building telecommunications and Smart City facilities in future land allocations in a bid to facilitate MNOs' easier access to premises for installing relevant infrastructures. For example, The UK Government amended the Electronic Communications Code[5] in late 2017 to ease MNOs to secure access to land from site owners to deploy new mobile sites and modify existing sites (e.g., for the addition of new antennas).

Moreover, it is also suggested that the Government streamlines site approval process among different Government bodies, for street furniture such as Smart lamp poles, road sign, bus shelter, common antenna tower for rural areas, sharing underground fibre resources, right of building access, Housing Authority and Tunnels, etc. The Government can take the leading role to introduce 5G infrastructure & applications in Government buildings & venues.

(ii) <u>Consolidating more 5G spectrum resource by re-farming 2G / 3G spectrums</u>

The sub-6GHz spectrum available for mobile communications in Hong Kong is

[2] https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/The-National-5G-Task-Force-Report.pdf
[3] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote24
[4] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote24
[5] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote24

inadequate. The bandwidth of the 2600MHz spectrum in Hong Kong is much lesser than 160MHz available in the Mainland. This deficiency of sub-6GHz spectrum would increase the cost of constructing 5G RBS, affecting 5G network coverage. Termination of 2G/3G network service and re-farming of 2G/3G spectrum for 5G network service could ease the urgency of this problem. The Government could take reference from different foreign countries such as France, Germany, and Australia in this regard[6].

It is appreciated that the Government had actively sought out solutions for releasing more frequency spectrum for 5G network service, in particular the good progress in relocating the telemetry, tracking and control ("**TT&C**") of satellites in Tai Po to remove the 3.5GHz restriction zone, and in supporting the upgrade of satellite Master Antenna Television ("**SMATV**") Systems to free up 3.5GHz spectrum for mobile service. CMHK expresses its support for the Government's endeavor in this respect. It is also hoped that the Government could take the lead in actively informing the public about the possible re-allocation of 2G/3G spectrums for 5G network service in the near future.

3.2 Legislative Framework

With the City entering into the new age of 5G, the legislative framework should be reformed to cope with this latest development to facilitate MNOs' easy access to premises in constructing RBSs. The current problems are that either landlord charges are high for MNOs to access premises to install RBSs, or that residents are apprehensive of having such infrastructure in the building due to radiation concerns. We therefore suggest that "telecommunications" should be treated equally as "utility" like water and electricity in buildings' Deed of Mutual Covenants in order to facilitate MNOs' access to private areas.

3.3 Policies

(i) Building a 5G smart city

[6] https://www.econstor.eu/bitstream/10419/190333/1/A1_3_Srinuan-and-Bohlin.pdf

In the construction of a Smart City, 5G and the IoT are important foundations, and MNOs play a vital role in this construction. With reference to "Call for Proposal" [7] in Singapore, it is hoped that the Government would invite MNOs, The Greater Bay Area 5G Industry Alliance, and any related stakeholders to participate in the public consultations and discussions to provide suggestions when drafting and updating the Smart City blueprint in future.

Regarding 5G development's positive impact on Smart City development, the Government could strengthen the planning of 5G development and build new infrastructures such as 5G network and data center. The policy address could incorporate 5G development into the blueprint of the development of a Smart City and encourage 5G-related technological innovation. We expect the Government and the industry to make full use of 5G, artificial intelligence, IoT, cloud computing, big data, blockchain, and other innovative technologies to build a Smart City operation center, improve the efficiency of the city's operations and citizen's quality of life, and promote various policies and applications. The Government could take "5G+ Strategy" of South Korea[8] and "5G Testbeds and Trail Programmes"[9] at the Department of Culture, Media and Sport of the UK as references when the formulation of relevant policies. It also may review relevant policies to support the 5G innovative application development, e.g. AI analytical solutions, connected drone, V2X/AV, etc.

(ii) Integration into the Smart Bay Area

The blueprint planning of a Smart City should actively be integrated into the layout of the Smart Greater Bay Area ("**the Bay Area**"). Furthermore, the advantageous industrial structure of the Bay Area should be used to actively develop the urban upgrading and transformation of Hong Kong and the Bay Area, promote smart transportation and smart healthcare in the Bay Area. There should be comprehensive development in various fields such as Fintech, Smart Tourism, and Distance Education; actively coordinate MNOs' 5G and IoTs roaming services to build a digital economic belt in the Bay Area. At the same time, Hong Kong could take reference from the

[7] https://www.imda.gov.sg/-/media/Imda/Files/About/Media-Releases/2019/Annex-A---5G-Policy-and-Use-Cases.pdf
[8] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote24
[9] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote24

Mainland and establish relevant best practice policies, network security policies, and related standards.

(iii) Encouraging and directing 5G to serve the public and implementing incentive policies for the application of 5G technology

The Government could take the lead in cultivating a friendly 5G development environment. On the one hand, educate citizens about the benefits of 5G technology through seminars, talks, live demonstrations, TV, radio, and newspapers. On the other hand, there could also be promotions and demonstrations of 5G applications. Examples are utilizing 5G+VR+4K/8K ultra-high definition of live broadcasts, promotions of tourist attractions, Government press releases, tender conferences, etc. Meanwhile, 5G technology could be utilized in public services and applications in the fields of security, workplace safety, emergency, as well as medical and surgery development that were not previously possible such as remote surgery and autopilot driving. Indeed, the Singapore Government has devoted $40 million to catalyze 5G research and innovation and has been exploring trials in Maritime Operations, Urban Mobility, Smart Estates, Industry 4.0[10]. It is about high time for the HKSAR Government to foster the establishment of 5G

The Government could encourage and support companies in related industries to explore the products and application of 5G. The Government could increase financial support for critical sectors such as finance, logistics, and ports through a "5G Exclusive Support Plan" to support enterprises using 5G to achieve digital transformation. It could also encourage companies to actively explore new 5G technology roadmap, to develop innovative 5G service models and business models, as well as to support leading companies in integrating 5G with complementary technologies for innovative application development.

At the same time, the Government may review the allowable emission power of 5G antenna, in order to enable effective use of 5G radio base station for better 5G network coverage, especially for high spectrum bands.

[10] https://www.imda.gov.sg/-/media/Imda/Files/About/Media-Releases/2019/Annex-A---5G-Policy-and-Use-Cases.pdf

3.4 Related Institutional Support

(i) Reduction of the cost of spectrum

The Government could consider reducing the spectrum fee in the auction and the cost of SUF to encourage MNOs to engage in the development of 5G. Indeed, the South Korean Government has offered MNOs a tax credit[11] equivalent to 2%-3% of their investment in 5G RBSs for two years between 2019 and 2020 to support 5G network investment. The Singapore Government keeps the cost of spectrum[12] reasonable by not imposing any premium beyond the 5G spectrum's annual fees. The HKSAR Government could take reference to the countries mentioned above and cities to support 5G network investment.

(ii) Subsidy Schemes

The Government could also consider devising policies to support lowering the costs of building 5G infrastructure and operational costs. Examples would be tax reduction, electricity, and rental subsidies. Moreover, for MNOs who complete constructing 5G infrastructure ahead of schedule, it is suggested that allowance for operational costs, spectrum license, and rewards could be granted as an incentive for MNOs. In Singapore, the Infocomm Media Development Authority will award spectrum[13] to MNOs who can deliver the desired outcomes and the best value for the Singapore economy.

While it is appreciated that the application period for "Subsidy Scheme for Encouraging Early Development of 5G" launched under the second round of the "Anti-epidemic Fund" was extended for half a year, it is recommended that the Government could consider regularizing such plan and shortening the approval period to encourage more industries to consider and research on 5G applications. In terms of support and promotion, it is possible to consider setting up a 5G application pilot zone for citizens' participation to normalize 5G applications in citizen's everyday lives and enhance the sustainable development of Hong Kong as a Smart City.

---

[11] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote24
[12] https://www.imda.gov.sg/-/media/Imda/Files/About/Media-Releases/2019/Annex-A---5G-Policy-and-Use-Cases.pdf
[13] https://www.imda.gov.sg/-/media/Imda/Files/About/Media-Releases/2019/Annex-A---5G-Policy-and-Use-Cases.pdf

Furthermore, it is suggested that the Government can subsidy for electricity, provide more subsidy or taxation incentive for 5G related R&D investment to support Smart City development.

(iii) Simplifying processing time within Government Departments

As previously mentioned, related departments could also streamline the application and approval process of 5G infrastructures. Shortening the reviewing process would significantly enhance an efficient 5G development. An example would be one of our Company's RBS has been suspended its usage for a year because the Land Department required the specific board resolution for that particular RBS while usual practice only requires a general board resolution for all RBSs. It is crucial to remove unnecessary inter-departmental and intra-departmental bureaucracy and red tape in order to facilitate the development of 5G in Hong Kong.

(iv) Establishing and improving the 5G technological innovation system, building a 5G innovation development ecosystem, and promoting the construction of 5G ecology

On the one hand, the Government could promote the establishment of 5G industrial parks, innovation centers, and incubation platforms for citizens; create a 5G innovation and entrepreneurial environment for small, medium, and micro enterprises; encourage 5G application innovation through the release of policies; and accelerate the incubation of frontier applications. On the other hand, Hong Kong could take advantage of its unique geographical location as a city in the Bay Area, as a bridge between the Mainland and the World, and as Asia's World City, to accelerate the formation of Hong Kong's 5G innovation ecosystem. The Government could refer to "Public-Private Partnership of 5G Forum"[14] established by the South Korean Government and Public-Private Collaboration for 5G use cases[15] coordinated by the Singapore Government to this effect.

[14] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote20
[15] https://www.imda.gov.sg/-/media/Imda/Files/About/Media-Releases/2019/Annex-A---5G-Policy-and-Use-Cases.pdf

The Government could also accelerate Hong Kong's role as a "super-connector" between the Mainland and the World. Providing a better business environment and policy support would encourage chain corporations to set up branches in Hong Kong so as to cultivate the vertical industrial chain while being part of the "Hong Kong-Macao Greater Bay Area" in Guangdong would help open up the industrial chain horizontally.

(v) City planning regarding remote areas coverage

We are given to understand that the 5G network coverage in remote areas is relatively weak. As such, the Government could consider learning from the Mainland's approach to increase the amount of and unify the requirements for tree-like tower cell sites to allow MNOs to install antennas.

(vi) Implementing a 5G Talent/Expert Program

The Government could increase policy support for the cultivation of 5G talents, improve the multi-dimensional training mechanism for professional talents, and encourage universities to set up 5G-related programs. Hong Kong could make good use of its advantageous position as an international hub, build a platform for exchanges and gatherings of talents from the Mainland and overseas, and cultivate and attract a group of internationally competitive 5G industry talents through subsidies for scientific research, funding, and rewards for scientific and technological talents. The Government could draw reference from Singapore to set up a 5G workforce transformation committees[16] to identify the talent requirements of 5G-related functions.

3.5 Any Other Issues of Relevance

(i) Utilizing platform resources

[16] https://www.computerweekly.com/news/252489767/Singapore-to-build-5G-talent-pipeline

CMHK supports a series of measures to encourage young people in Hong Kong to start their own businesses and seek employment in the Bay Area, such as the "Greater Bay Area Youth Employment Program" to be launched by the Government.

The Government could further encourage entrepreneurship and employment of young people in the Bay Area. The Government can serve as a bridge between active and influential industry alliances and associations in the Bay Area and provide a platform for young people to seize innovation and technology development opportunities in the Bay Area.

(ii) Strengthening marketing and technical training

Training of entrepreneurs and employees could also be strengthened, through an enhanced understanding of the mainland market and training on emerging technologies, such as 5G and artificial intelligence. The digital economy based on new technologies is a burgeoning industry and could be a general direction for youth entrepreneurship and employment. It is crucial for the Government to frame human resources development. The HKSAR Government could reference the "Cyber Skills Immediate Impact Fund"[17] by the UK Government to incentivize a range of organizations ranging from face-to-face teaching and online teaching to develop, scale-up, or refocus emerging technologies training initiatives. It would also be conducive for the Government to launch a council through a consortium of 5G professional bodies in order to establish a nationally recognized career structure of the whole 5G Industry, with reference to the UK Cyber Security Council[18]. Moreover, to encourage the application of emerging technologies, the Government could imitate South Korea to provide innovative 5G start-ups with financial support[19] in the form of loans and grants so as to spur innovation for a better Hong Kong.

(iii) Health concern from the public

[17] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote20
[18] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote20
[19] https://www.legco.gov.hk/research-publications/english/essentials-1920ise06-5g-technology.htm#endnote20

We express our support for OFCA to ensure the radiation levels of RBSs to be in line with international safety standards and to deploy its staff to conduct site inspections and measurements of radiation levels in operating RBS as per citizens' requests to ensure the radiation levels would not exceed the prescribed levels. However, in light of citizen's continued yet understandable concern, it is recommended that OFCA could strengthen educating the public regarding the radiation levels of RBSs and the existing regulatory measures. It could alleviate concerns by emphasizing that to date, radiation levels in existing RBSs are in line with international standards and that regular usage of the 5G network would not pose health hazards to users.

5. Conclusion

Lastly, on behalf of CMHK, We would like to extend our appreciation for the invitation to express our views on 5G development in Hong Kong. We are honored to be a part of the driving force in propelling the City's 5G development forward. We remain optimistic about the future development of 5G in Hong Kong and we hope that the above could furnish you with sufficient information on the difficulties faced by MNOs with corresponding suggestions from operators' perspective. Thank you.

Yours faithfully

China Mobile Hong Kong Company Limited