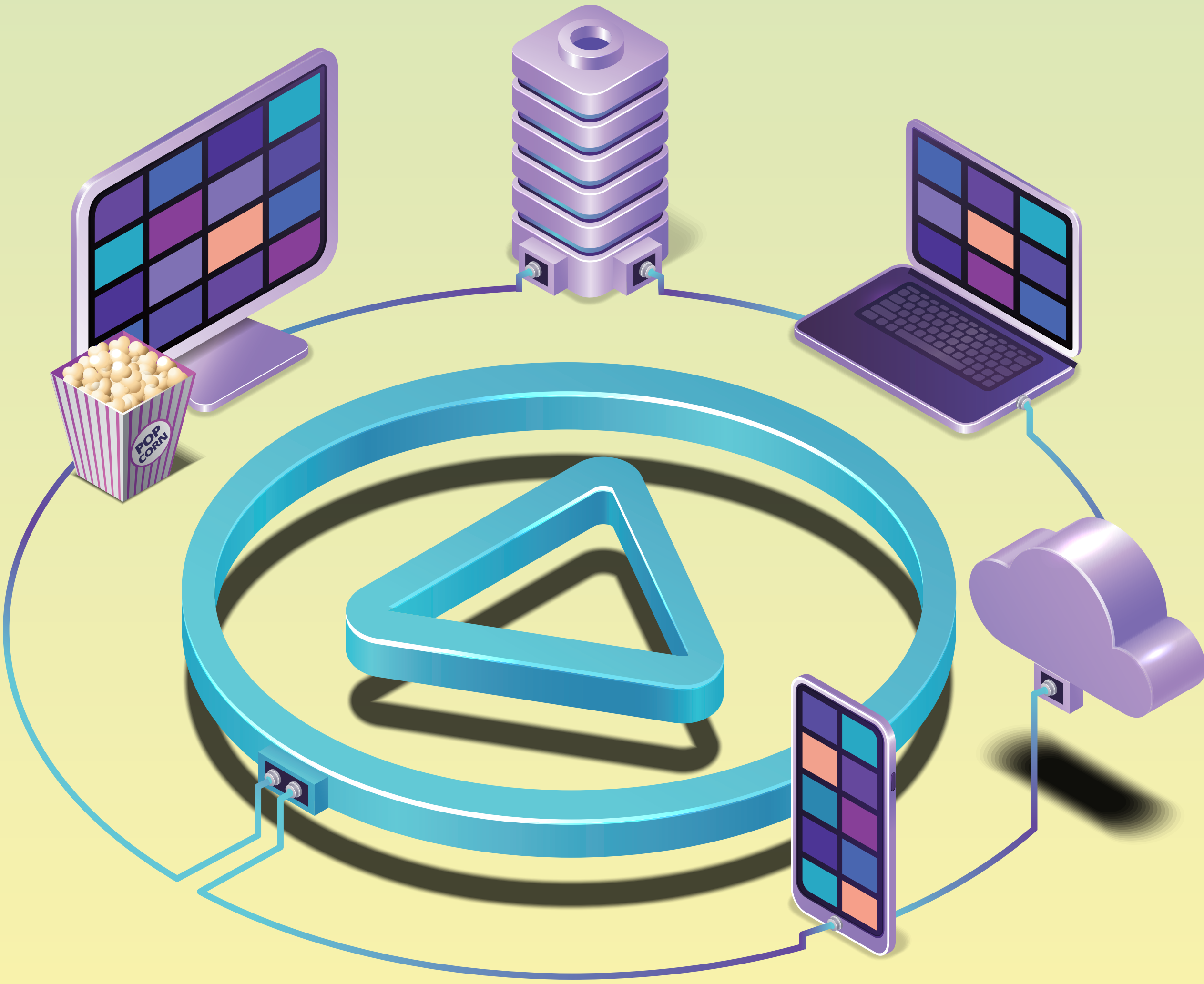
Overview of Major Developments In the Communications Market



Broadcasting

5.1 An Overview of the Developments in the Broadcasting Market

5.1.1 Number of Licensees and Channels

Television Programme Services

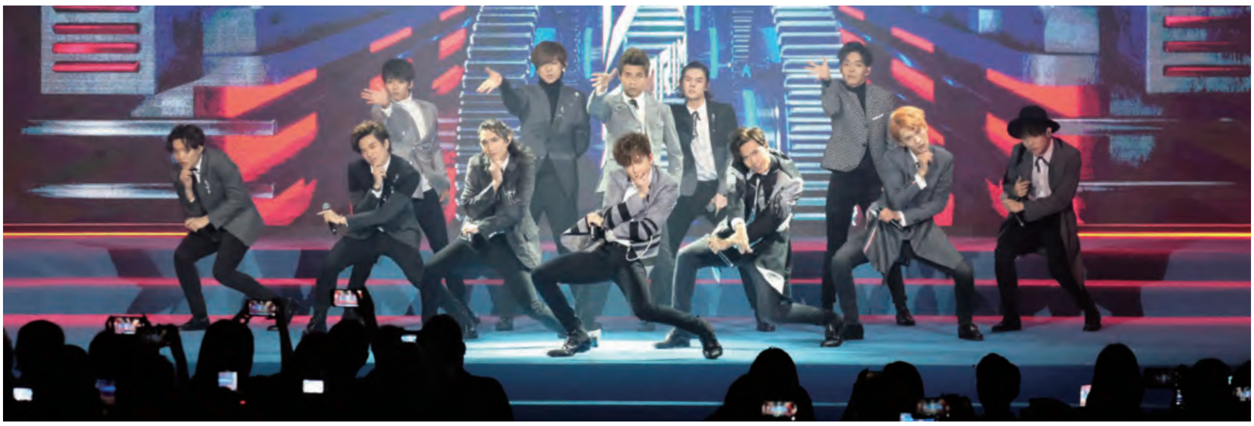
As at March 2020, the total number of free TV, pay TV and non-domestic TV licensees was 17. They provided 566 television channels[2] of which 421 were receivable in Hong Kong. An overview of the channels provided by the television programme service licensees is shown in **Figure 1**.

As at March 2020, there were three **free TV licensees**, viz. Fantastic Television Limited (Fantastic TV), HK Television Entertainment Company Limited (HKTVE) and Television Broadcasts Limited (TVB). They provided a total of 12 channels, comprising nine digital channels all broadcast in high definition television (HDTV) format and three analogue channels. The above channels included three channels which were broadcast in both digital and analogue formats, viz. "Jade" and "Pearl" (by TVB) as well as "Hong Kong Open TV" (by Fantastic TV). The remaining six digital channels were "ViuTV" and "ViuTVsix" (by HKTVE); "J2", "TVB News Channel" and "TVB Finance & Information Channel" (by TVB) and "Hong Kong International Business Channel" (by Fantastic TV). RTHK, as the public service broadcaster in Hong Kong, provided three digital channels with two of them also simulcast in analogue format.

As at March 2020, there were two **pay TV licensees**, viz. Hong Kong Cable Television Limited (HKCTV) and PCCW Media Limited (PCCW Media), providing a total of 366 pay television channels and offering a diverse range of local and non-local productions. Among those channels, over 120 were HDTV channels.

As at March 2020, there were 12 **non-domestic TV licensees** providing a total of 188 television channels[3]. Hong Kong viewers could receive 43 of those television channels.

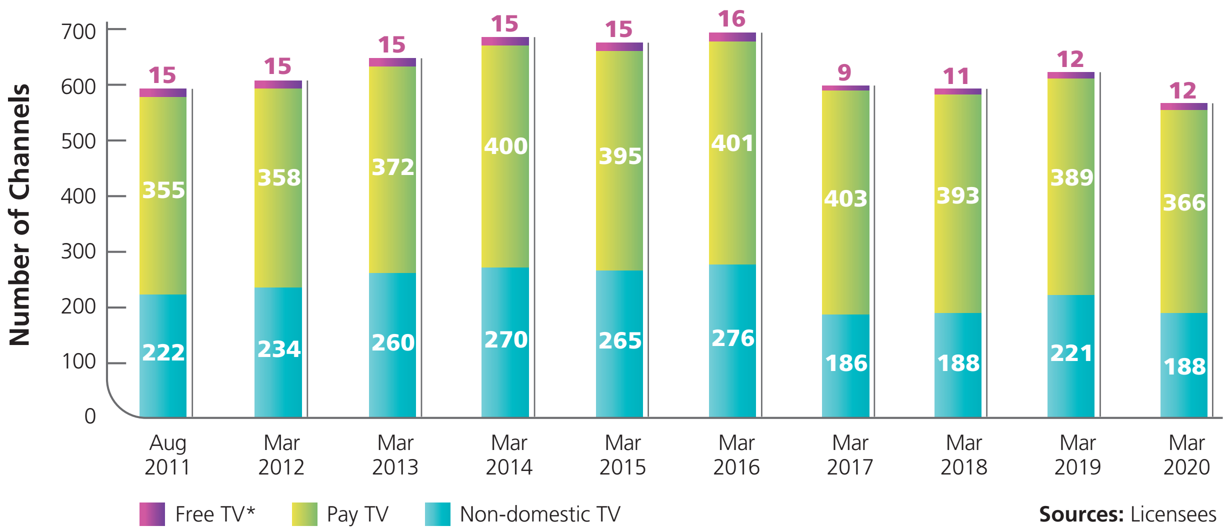
During the period under review, there were 21 **other licensable TV licensees** providing television programme services in hotels in Hong Kong. Together they provided services to about 70 hotels in Hong Kong.



2 Some channels were provided by more than one licensee at the same time.

3 In October 2020, the Authority accepted the application by one of the non-domestic TV licensees for termination of its licence with effect from 26 August 2020. The number of non-domestic TV licensees was reduced to 11.

Figure 1: Television Channels Provided by Television Programme Service Licensees in Hong Kong (as at 31 March 2020)



Sources: Licensees

*The simulcast channels of Asia Television Limited (2011-2016), TVB (2011-2020) and Fantastic TV (2018-2020) are counted for both the analogue and digital platforms.

In addition to satellite television channels provided by non-domestic TV licensees, Hong Kong viewers can also receive free unencrypted satellite television programme channels uplinked from outside Hong Kong. As at March 2020, there were more than 400 free-to-air satellite television channels available for reception via the SMATV systems in Hong Kong. The list of channels currently available can be downloaded at http://www.ofca.gov.hk/filemanager/ofca/en/content_295/st_smatv.pdf.

Sound Broadcasting Services

During the period under review, there were two **sound broadcasting licensees**, namely, Hong Kong Commercial Broadcasting Company Limited (CRHK) and Metro Broadcast Corporation Limited (Metro). RTHK as the public service broadcaster also provided sound broadcasting service.

As at March 2020, there were 13 radio channels (three by CRHK, three by Metro and seven by RTHK). All channels provided by the commercial licensees and RTHK were broadcast round-the-clock.

5.1.2 Transmission Modes

Television

The regulatory framework for television programme services in Hong Kong as enshrined in the BO is technology-neutral[4]. Licensees are free to choose their transmission arrangements for delivery of television services. Broadcasters may build their own transmission networks to deliver their services and, in such cases, they need to apply for a carrier licence from the Authority to cover the transmission network. Alternatively, they may engage any of the existing carrier licensees to provide the transmission service. Licensees may also provide their television programme services via multiple transmission platforms so as to extend their coverage.

The transmission modes employed by television programme service licensees are set out in **Figure 2**.

4 An exception is that a service provided on the Internet is exempted from the regulatory framework under the BO.

Figure 2: Transmission Modes Employed by Television Programme Service Licensees

Licensee	Transmission Mode	Network Coverage (as at March 2020)
Free TV		
TVB	Terrestrial UHF[5], including (a) Analogue PAL-I format; and (b) Digital National Standard format	99% of population
HKTVE	Terrestrial UHF and Fixed broadband network	99% of population
Fantastic TV	HFC[6] and MMDS[7]	Around 93% of total households
Pay TV		
HKCTV	HFC, MMDS and satellite (Digital)	Around 95% of total households
PCCW Media	PON and DSL[8] Broadband network (Digital)	Around 97% of total households
Non-domestic TV		
11 licensees 1 licensee	Satellite (Digital) IPLC[9] and Satellite (Digital)	32% of total households (859 521 households)[10]

Penetration of Different Broadcasting Services

The penetration rate of free TV services stood at about 96% of the total households as at end of March 2020[11]. As regards DTT services, the take-up rate was about 93% of all the households in March 2020[12].

The penetration of licensed pay TV services was about 81%[13] of the total households as at end of March 2020. The total number of subscribers to licensed pay TV services stood at about 2.1 million in March 2020[14]. The changes in total number of subscribers from 2011 to 2020 are shown in **Figure 3**.

5 Terrestrial Ultra High Frequency

6 Hybrid Fibre Coaxial Cable

7 Microwave Multipoint Distribution System

8 Passive Optical Network and Digital Subscriber Line

9 International Private Lease Circuit

10 The non domestic TV services mainly serve viewers in the Asia Pacific region, Europe and Africa and do not target Hong Kong, but some Hong Kong households can receive the unencrypted channels.

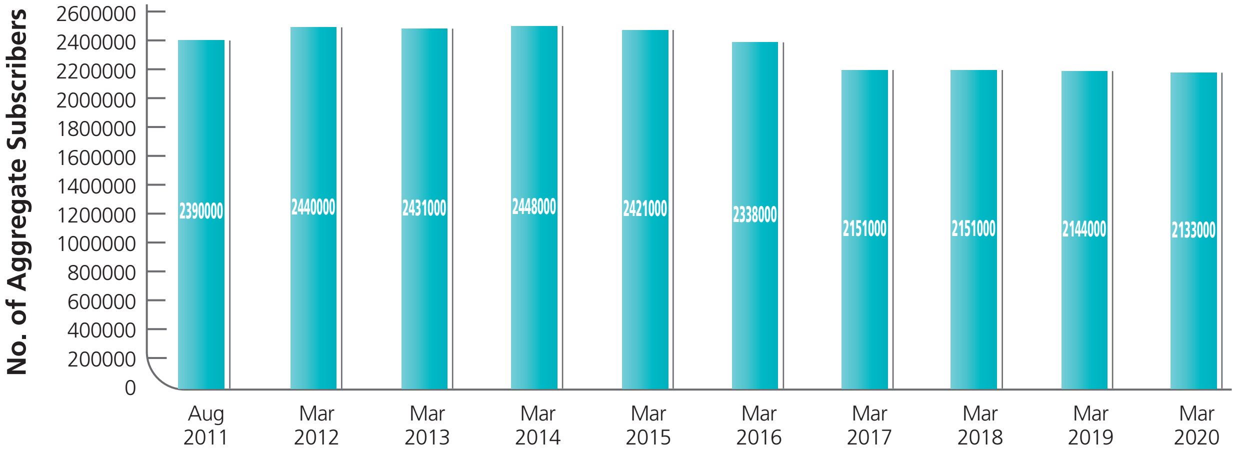
11 Source: HKTAM Establishment Survey, CSM Media Research

12 According to a public survey conducted from September to November 2019 , about 92% of the households in Hong Kong were receiving DTT services. A follow-up survey was conducted between February and March 2020.

13 Penetration of licensed pay TV services is calculated by dividing the total number of subscribers to licensed pay TV services by the total number of households. Some subscribers were counted more than once if they subscribed to more than one pay TV service.

14 Some subscribers were counted more than once if they subscribed to more than one service.

Figure 3: Subscribers to Licensed Pay TV Services in Hong Kong



Sources: Licensees

Sound Broadcasting

During the period under review, the radio broadcasters provided their services in FM and AM modes. Seven FM programme channels were provided through seven hilltop sites, supplemented by two low-power FM gap-fillers. In addition, six AM programme channels were broadcast from two island and hilltop sites, supplemented by six low-power AM/FM gap-fillers. The services practically covered the whole area of Hong Kong.

5.1.3 Broadcasting Revenues and Investment

Licensed broadcasting services contributed an estimated $7.35 billion[15] to the Hong Kong economy, which represented about 0.3% of the gross domestic product in 2019. There are two main sources of revenues for the provision of broadcasting services, viz. advertising and subscription. The incomes of free TV licensees and sound broadcasting licensees mainly come from advertising sales[16]. Pay TV licensees, on the other hand, derive their incomes mainly from subscription fees with advertising sales a secondary income source.

15 Source : Company reports of major broadcasting licensees providing television programme services in Hong Kong

16 These include sales of advertising spots within programme breaks, programme sponsorship and product placement.

Advertising Revenue

According to the report of admanGo, the advertising expenditures on television and radio accounted for 30% (about $8 billion) and 4% (about $1 billion) respectively of the accumulated $26 billion advertising expenditures in the media in 2019[17].

In 2019, the actual advertising revenues of HKTVE and TVB were around $259 million and $1.91 billion respectively. The actual advertising revenues of other licensees were not publicly available.

Subscription Revenue

According to the annual report of PCCW Limited (PCCW), the holding company of PCCW Media, the turnover of its pay TV service and related services provided in Hong Kong under the "nowTV" brand was $2.69 billion in 2019.

The subscription revenue of HKCTV is not publicly available.

Investment in Broadcasting Industry

Key investment projects in the television industry in recent years include digitisation of the terrestrial broadcasting network, HDTV content and production technology, interactive television services, and regular network maintenance and upgrades that are required to maintain or expand the ever-advancing scope of services.

17 Source: Adspend Report for 2019 of admanGo. All the advertising expenditures presented in the report have taken into consideration the discount factor based on an assumption of an off rate card rate. It is stated in the Adspend Report for 2019 that to accommodate the rate card for digital media, the off rate card rate has been revised from the previous 60% to the current 75%.

Fantastic TV, HKTVE and TVB have respectively committed to investing a total of $1.2 billion for the six-year period from 2016 to 2022, $1.5 billion for the six-year period from 2015 to 2021 and $6.3 billion for the six-year period from 2016 to 2021 for the provision of free TV services. Investment commitments of Fantastic TV, HKTVE and TVB comprise capital expenditures and programming expenditures. As at March 2020, Fantastic TV, HKTVE and TVB provided 336, 282 and 817 hours of HDTV programmes per week respectively. Fantastic TV and TVB also provided 75 and 1 090 hours of independent local productions in their programming respectively in 2019.

As regards the pay TV market, i-CABLE Communications Limited, the parent company of HKCTV, reported in its 2019 Annual Report that the capital expenditure of the group decreased from $179 million in 2018 to $133 million in 2019. Its major items of investment included property, plant and equipment. According to the 2019 Annual Report of PCCW, the parent company of PCCW Media, the capital expenditure on its media business decreased from $360 million in 2018 to $213 million in 2019. The decrease was mainly due to completion of the relocation and upgrading of production studio facilities in 2018.

CRHK and Metro have committed to investing a total of $909 million[18] and $685 million respectively for the six-year period from 2016 to 2022 for the provision of sound broadcasting services. The investment commitments of CRHK and Metro cover programming improvement and upgrading of infrastructure and facilities and other developments brought by technological advancement to further enhance their service quality.

18 In October 2020, the Authority approved CRHK's updated investment commitment of $703 million, adjusted from the original $909 million.

5.1.4 Programme Variety and Positive Programme Requirements

(a) Programme Variety and Diversity

Number of Broadcast Hours and Hours of Station Productions

As at March 2020, the licensees broadcast about 62 326 hours of television programmes a week. Among them, the three analogue channels of Fantastic TV and TVB provided a total of 503 broadcast hours per week. The nine digital channels of Fantastic TV, HKTVE and TVB provided a total of 1 465 broadcast hours per week, while the 366 channels of the two pay TV licensees provided a total of 53 134 broadcast hours per week. As a public service broadcaster, RTHK provided 336 hours on its two analogue channels and 504 hours on its three digital channels per week. As at March 2020, the 43 channels of non-domestic TV licensees receivable in Hong Kong provided a total of 7 224 broadcast hours per week.

The weekly number of broadcast hours for CRHK, Metro and RTHK as at March 2020 was 2 184.

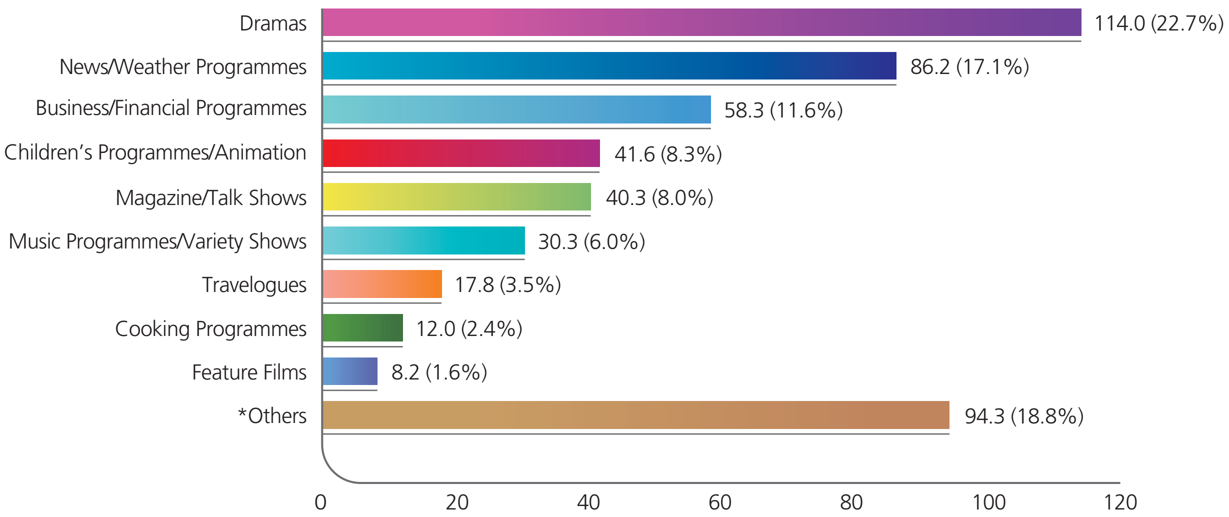
For the period under review, there were a total of 45 149 hours of station productions broadcast on Fantastic TV, HKTVE and TVB, of which 11 568 hours were on three analogue channels and 33 581 hours on nine digital channels. Of the 366 channels provided by pay TV licensees, 76 channels (20.8%) were produced by the licensees themselves.

Free TV Services

Chinese and English Channels

During the period under review, drama series, news/weather programmes and business/financial programmes were the dominating programme genres during prime time on the Chinese channels (viz. "Hong Kong Open TV", "Jade" and "ViuTV"). Drama series on "Jade" were mostly in-house productions; while "Hong Kong Open TV", "Jade" and "ViuTV" broadcast Mainland, Korean and Japanese drama series. In addition, magazine/talk shows, music programmes/variety shows, travelogues and feature films, etc. were also broadcast during prime time on the Chinese channels. The three channels provided by RTHK presented a variety of programmes to serve a broad spectrum of audiences and cater to the needs of minority interest groups.

Figure 4: Weekly Hours of Different Types of Programmes Broadcast on Hong Kong Open TV, Jade and ViuTV (as at March 2020)

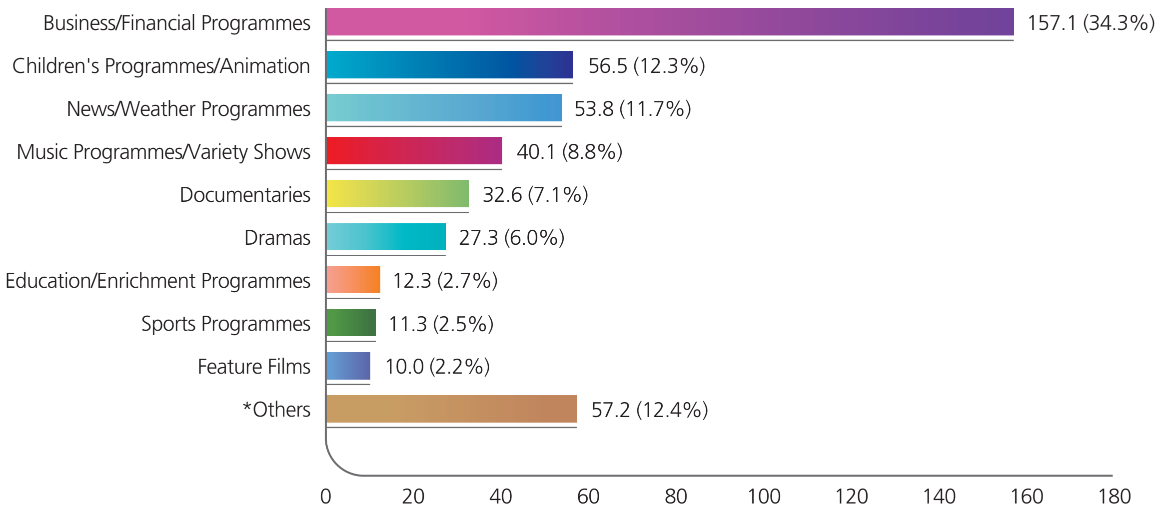


*Other programmes include current affairs programmes, sports programmes and health/medical programmes etc.

Weekly Total: 503 Hours
Sources: Licensees

The English channels (viz. "Hong Kong International Business Channel", "Pearl" and "ViuTVsix") broadcast a wide range of programmes, including business/financial programmes, children's programmes/animation, news/weather programmes, music programmes/variety shows, documentaries, imported popular drama series, education/enrichment programmes, sports programmes and feature films.

Figure 5: Weekly Hours of Different Types of Programmes Broadcast on Hong Kong International Business Channel, Pearl and ViuTVsix (as at March 2020)



*Other programmes include current affairs programmes, cooking programmes and health/medical programmes etc.

Weekly Total: 458.2 Hours
Sources: Licensees

Thematic Channels

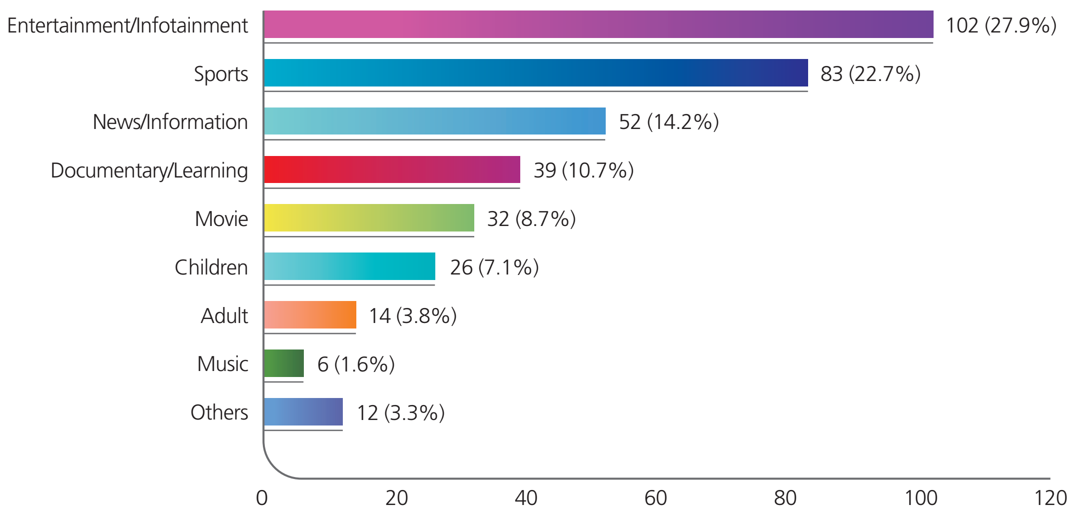
During the period under review, TVB provided acquired dramas, documentaries, variety shows, news, finance information programmes, etc. on "J2", "TVB News Channel" and "TVB Finance & Information Channel".

Pay TV Services

During the period under review, a wide variety of channels were offered on pay TV services, including entertainment/infotainment channels (27.9%), sports channels (22.7%), news/information channels (14.2%), documentary/learning channels (10.7%), and movie channels (8.7%).

As at March 2020, HKCTV offered 133 channels (including 45 HDTV channels). PCCW Media's "nowTV" service offered 169 channels (including 83 HDTV channels) and 64 video-on-demand services.

Figure 6: Nature of Pay TV Channels (as at March 2020)



Total Number of Channels: 366
Sources: Licensees

Sound Broadcasting

As at March 2020, CRHK operated two FM Cantonese language services, viz. "CR1" and "CR2", and one AM English language service, "AM 864". "CR1" mainly provided news, current affairs, financial and personal view programmes. "CR2" was mainly an entertainment channel featuring pop culture and music targeting young listeners. "AM864" was primarily a music channel.

Metro operated two FM Cantonese language services, viz. "Metro Finance" and "Metro Info", and one AM English language service, viz. "Metro Plus". "Metro Finance" provided real-time, market-moving news and information about financial markets around the world. "Metro Info" provided music and entertainment programmes as well as programmes on lifestyle, health, market news and other information of interest to the public. "Metro Plus" was a music channel which also provided programmes for ethnic groups including the Filipino, Indian and Thai communities in Hong Kong.

RTHK operated seven radio channels, providing Cantonese, English and Putonghua services. It offered a variety of thematic channels ranging from information to general entertainment and culture.

(b) Positive Programme Requirements

Free TV Services

During the period under review, free TV licensees (viz. Fantastic TV, HKTVE and TVB) were required to broadcast at least 27.5 hours of positive programmes[19] per week. They all met the requirements[20].

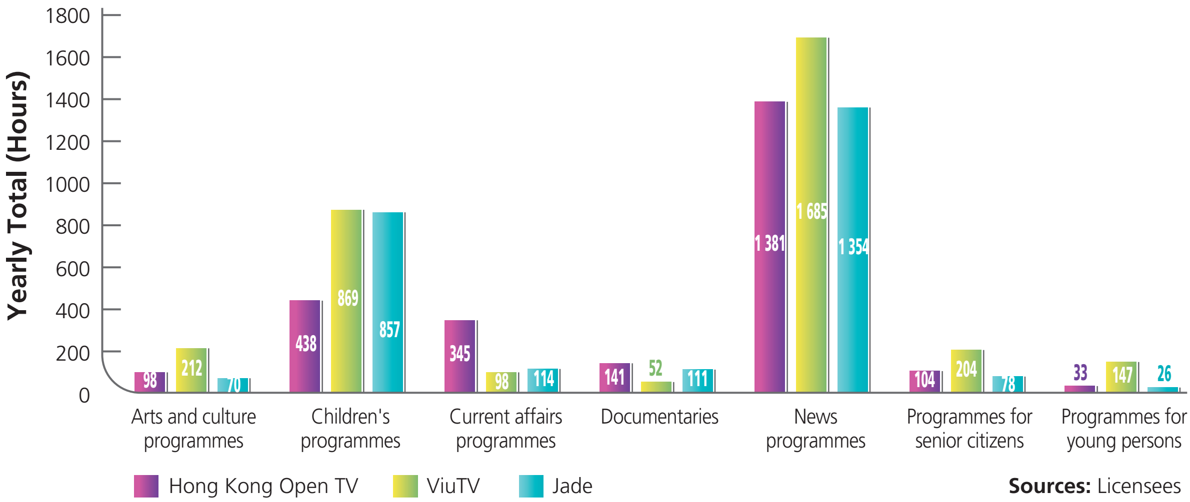
The reports submitted by the licensees to the Authority on six types of positive programmes, viz. current affairs programmes, documentaries, children's programmes, programmes for young persons, programmes for senior citizens and arts and culture programmes, are available at http://www.ofca.gov.hk/en/pub_report/compliance_reports/index.html.

19 The positive programmes that Fantastic TV, HKTVE and TVB were required to broadcast comprised news, current affairs programmes, documentaries, arts and culture programmes, children's programmes and programmes for senior citizens and young persons

20 TVB was required to broadcast at least 45.5 hours of positive programmes per week, including four hours of positive programmes per week on its thematic digital channels (viz "J2", "TVB Finance & Information Channel" and "TVB News Channel"), while HKTVE was required to broadcast at least 41.5 hours of positive programmes per week.

As Fantastic TV uses a fixed network as its transmission means to deliver free TV service, the programme requirements of Fantastic TV are less stringent than those applicable to other spectrum-based free TV licensees (viz. HKTVE and TVB). It was required to broadcast at least 27.5 hours of positive programmes per week.

Figure 7: Broadcast of Positive Programmes on the Chinese Channels of Fantastic TV, HKTVE and TVB (as at March 2020)



Sources: Licensees

Free TV licensees were required to provide Chinese subtitles for all news, current affairs programmes, weather programmes and emergency announcements, as well as programmes broadcast during prime time (7:00 p.m. to 11:00 p.m.) on the Chinese channels[21]. They were also required to provide English subtitles for all news, current affairs programmes, weather programmes, emergency announcements and educational programmes for teenagers (two hours per week) on the English channels. HKTVE and TVB were required to provide Chinese subtitling for all drama programmes on the Chinese channels and English subtitling for all programmes broadcast on the English channels between 8:00 p.m. and 11:30 p.m. On the whole, Fantastic TV, HKTVE and TVB complied with the requirements on provision of subtitles.

To meet public demand for easier access to information by persons with hearing impairment, the Authority issued a direction requiring TVB[22] to provide sign language interpretation, in addition to subtitles, for a Cantonese news programme broadcast on its "Pearl" channel each day with effect from July 2018. TVB met the requirement.

21 TVB was also required to provide, on its thematic digital channels, Chinese subtitles for all news, current affairs programmes, weather programmes and emergency announcements as well as programmes broadcast during prime time.

22 In the context of the licence renewal exercise of TVB in 2015, the Authority took note of the increasing demand from persons with hearing impairment for sign language interpretation for news programmes and agreed to facilitate the provision of sign language interpretation for news programmes as a new initiative. The CE in C accepted the Authority's recommendation and included an enabling provision in TVB's renewed licence to require it to provide sign language for its free TV service as directed by the Authority.

Pursuant to licence requirements, Fantastic TV, HKTVE and TVB were required to broadcast one minute of Announcements in the Public Interest (APIs) in each hour on each channel. Also, they were required to broadcast, on a weekly basis, not more than five minutes in aggregate of publicity material for the Authority on each of the Chinese and English channels[23]. During the period under review, Fantastic TV, HKTVE and TVB broadcast a total of 1 304 hours of the two types of materials[24].

Sound Broadcasting

As regards sound broadcasting services, licensees were required to broadcast at least 28.5 hours of positive programmes[25] per week. CRHK and Metro complied with the licence conditions on broadcast of positive programmes.

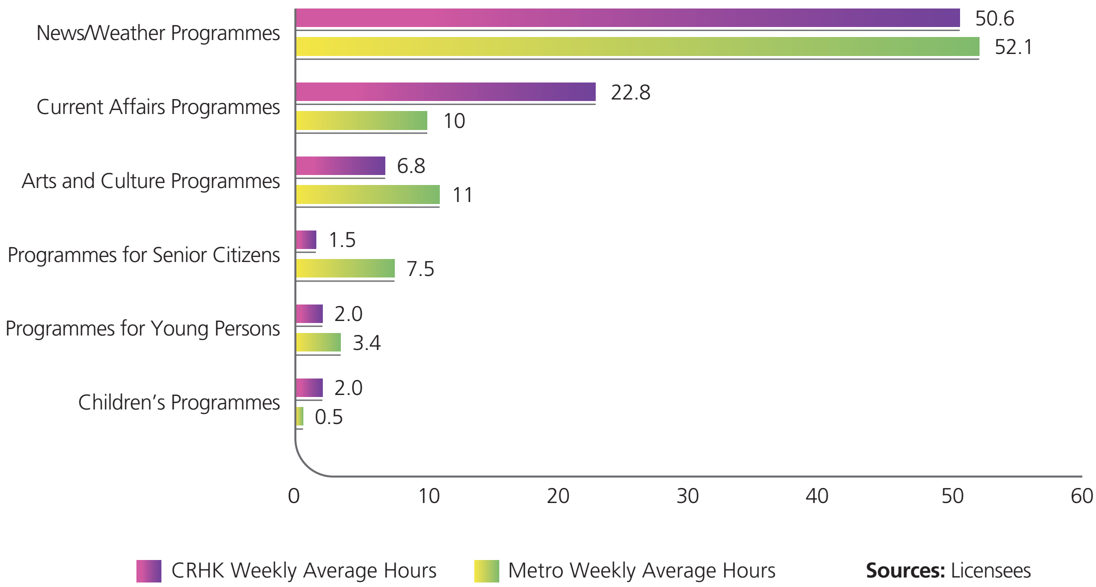
All sound broadcasting licensees were required to broadcast one minute of APIs in each hour and not more than five minutes of publicity material for the Authority each week on each service channel. All licensees complied with the requirements.

23 TVB was required to broadcast two minutes of publicity material for the Authority per week on its thematic digital channels.

24 If a free TV channel was simulcast in both analogue and digital formats, the total number of hours of APIs and publicity material for the Authority was calculated only by reference to the materials broadcast in digital format.

25 The positive programmes that CRHK and Metro were required to broadcast comprised news and weather programmes, current affairs programmes, arts and culture programmes and advisory programmes, viz. programmes for young persons, senior citizens and children.

Figure 8: Broadcast of Positive Programmes on Sound Broadcasting Services (as at March 2020)



Sources: Licensees

5.1.5 Hong Kong as a Regional Broadcasting Hub

Hong Kong is a broadcasting hub in the Asia-Pacific region. As at March 2020, there were 12 non-domestic TV licensees operating in and broadcasting from Hong Kong. Altogether, they offered a total of 188 satellite television channels with 43 channels receivable in Hong Kong, serving viewers in the Asia-Pacific region, Europe and Africa. A summary of non-domestic TV services as at March 2020 is at **Annex 1**.

Telecommunications

5.2 An Overview of the Telecommunications Market

Hong Kong has one of the most sophisticated and successful telecommunications market in the world. This has been an important factor in Hong Kong's development as a leading business and financial centre. In 2019, the telecommunications sector employed around 20 000 persons whilst its gross output amounted to $96 billion in 2018.

All sectors of Hong Kong's telecommunications market have been liberalised with no foreign ownership restrictions on telecommunications operators. The Authority's objectives are to maintain a level playing field in the open and competitive telecommunications market and to ensure that consumers get the best services available in terms of efficiency, quality and price.

5.2.1 The Telecommunications Regulatory Framework

Carrier Licences

The Authority issues carrier licences to facility-based operators, authorising them to establish and maintain telecommunications networks and facilities which may cross unleased Government land and public streets, for the provision of public telecommunications services.

The unified carrier licensing framework has been implemented since 1 August 2008 as the single licensing vehicle for the provision of facility-based fixed, mobile and/or converged telecommunications services in Hong Kong.

A Unified Carrier Licence (UCL) for the provision of local fixed service authorises the licensee to establish and maintain fixed network, wireline-based or wireless-based, or a combination of both where applicable, to provide local telecommunications services between fixed points within Hong Kong. A UCL for the provision of external fixed service authorises the licensee to provide external facilities and services operated over external facilities. A UCL for the provision of mobile service enables the licensee to provide two-way communications between moving locations or between a moving location and a fixed location in Hong Kong. The issue of new UCL for the provision of mobile service is subject to the availability of radio spectrum for assignment. An operator may apply for a single UCL to provide all the above services.

As at March 2020, there were a total of 62 carrier licensees, providing local fixed services, cable-based external fixed services, non cable-based external fixed services and/or mobile services. Among them, there were 61 UCL holders, while the remaining one was a holder of Mobile Carrier Licence (MCL), whose licence was issued before the introduction of the UCL.

Public Radiocommunications Service Licences

Services which may be authorised under the Public Radiocommunications Service (PRS) Licence include radio paging, community repeater (trunked radio) services, vehicle location information services, one-way data message services, public mobile radio data services and railway signaling services.

As the provision of radiocommunications services requires the assignment of suitable operating frequencies, PRS Licences are granted only when the required radio spectrum is available.

As at March 2020, there were a total of eight PRS licensees.

Services-based Operator Licences

Services-based Operators (SBO) make use of the networks and facilities of other licensed facility-based operators for the provision of public telecommunications services, but they are not authorised to establish or maintain any telecommunications means which cross public streets or unleased Government lands.

SBO licence covers three types of services, namely, Class 1 and Class 2 local voice telephony services, and Class 3 services which may include external telecommunications service, Internet access service, international value-added network service, MVNO service, private payphone service, public radio communications relay service, security and fire alarm signals transmission service, teleconferencing service and mobile communications service on board an aircraft.

As at March 2020, there were a total of 490 SBO licensees.

Class Licences

The class licensing framework does not require any licence applications. Parties meeting the specified eligibility criteria and conditions automatically become the class licensees, and are required to comply with the conditions set out in the relevant Class Licence as well as the TO. Currently, there are nine types of Class Licences:

- Class Licence for 79 GHz Automotive Radar
- Class Licence for 60 GHz Device
- Class Licence for Citizens Band Radio Station
- Class Licence for In-building Telecommunications Systems
- Class Licence for Medical Implant Communication System Device
- Class Licence for Short Range Device
- Class Licence for Taxi Mobile Station
- Class Licence for Offer of Telecommunications Services
- Class Licence for Provision of Public Wireless Local Area Network Services

Other Licences

Apart from the licences mentioned above, there are a number of miscellaneous licences under the purview of the Authority.

A breakdown of the types and numbers of all telecommunications licences is at **Annex 2.**

5.2.2 Developments in the Telecommunications Market and Technology Trends

Mobile Communications Services

Competition in public mobile services has been keen. As at March 2020, four major MNOs, namely, China Mobile Hong Kong Company Limited, Hong Kong Telecommunications (HKT) Limited, Hutchison Telephone Company Limited and SmarTone Mobile Communications Limited, were providing a wide range of public mobile services.

The four major MNOs provide 2G, 3G and 4G services and more recently also 5G services in Hong Kong at very affordable prices. As at March 2020, there were about 23.2 million subscriptions to mobile communications services. The mobile subscriber penetration rate[26] reached 275.9%, one of the highest in the world. The number of 3G/4G subscriptions totalled 23 million in March 2020 and the subscriber penetration rate was 272.9%. Mobile data services were available at downlink speeds of up to 1.1 gigabit per second (Gbps). Following the launch of 5G services in April 2020, even higher speed of mobile communications will be supported with download speeds of around 10 to 20 times of 4G services.

With an ever growing demand for mobile data services, the monthly mobile data usage surged to 75 664 Terabytes in March 2020, representing 1.4 times and 1.9 times of the monthly usage over the same period in 2019 and 2018 respectively. The mobile data usage per capita reached 10 088 Megabytes in March 2020, compared with 7 335 Megabytes in March 2019 and 5 444 Megabytes in March 2018. The launch of 5G services is expected to further boost mobile data usage in the future.

26 Calculation of the overall mobile subscriber penetration rate and that for subscribers of 3G/4G services does not include machine type conne ctions.

Figure 9: Number of Mobile Subscriptions (2010 to 2019)

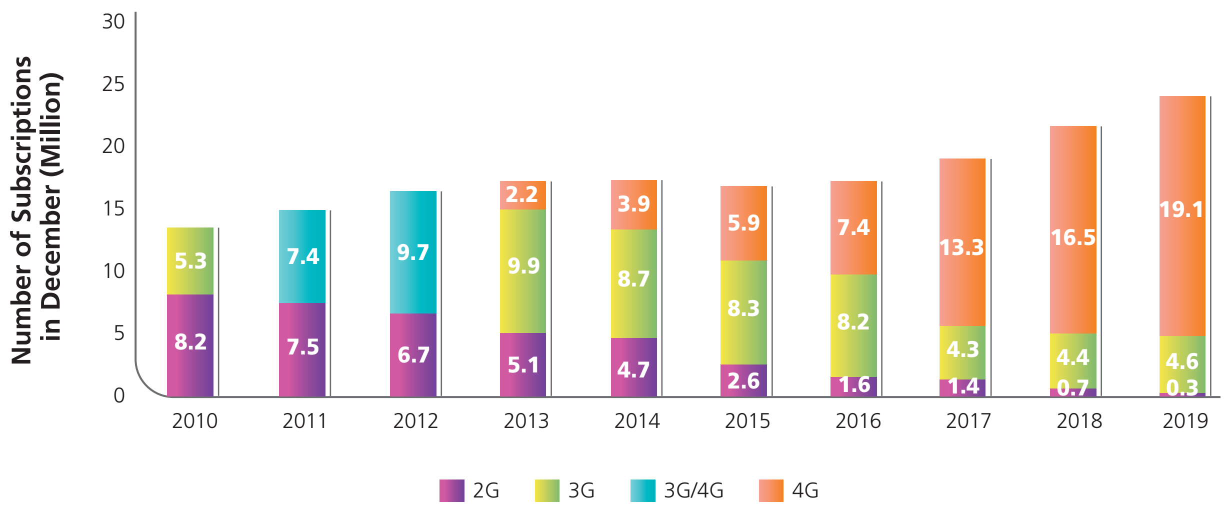


Figure 10: Mobile Subscriptions of Postpaid and Prepaid SIM (2010 to 2019)

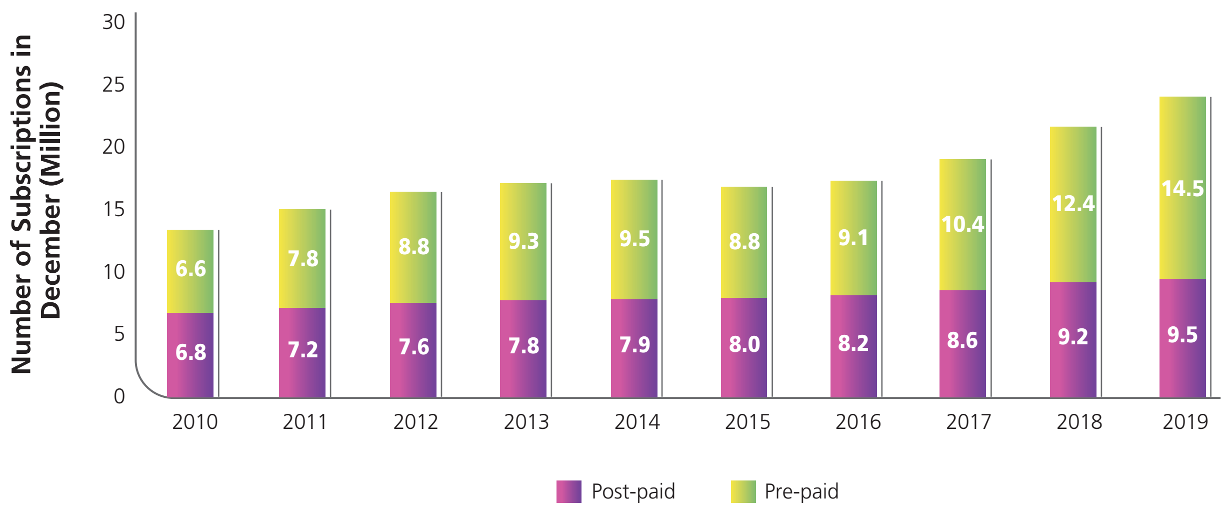
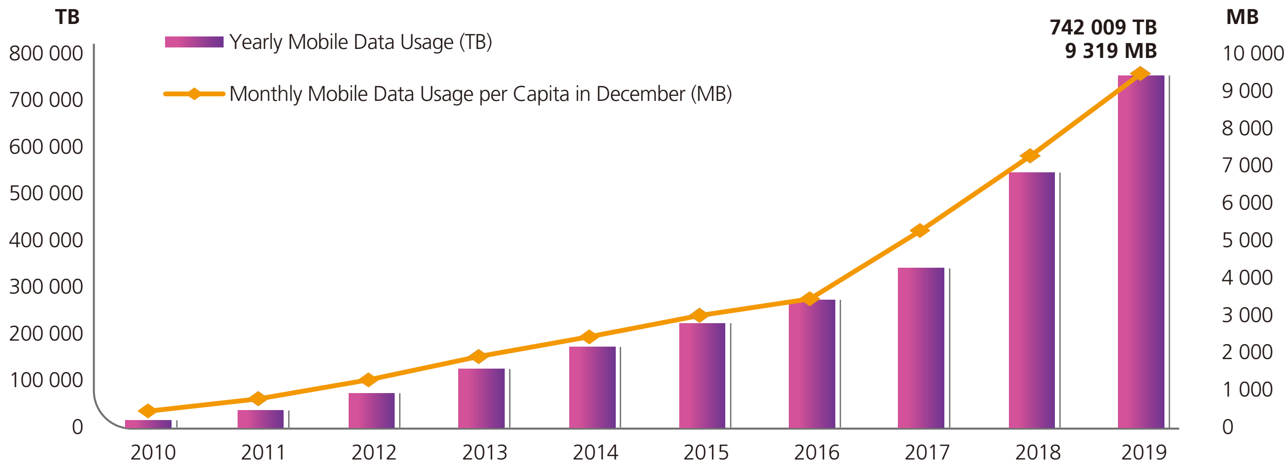


Figure 11: Mobile Data Usage (2010 to 2019)



Fixed Communications Services

The local fixed communications services market is liberalised with no preset limit on the number of licences to be issued for fixed services, or deadline for submission of licence applications. Furthermore, there is no specific requirement on network roll-out and investment and licensees may provide their services according to their proposals.

As at March 2020, there were 27 local fixed carriers, providing around 85 fixed lines per 100 households, one of the highest in the world. They were, in alphabetical order:

- 21 ViaNet Group Limited
- China Mobile Hong Kong Company Limited
- China Mobile International Limited
- China Telecom Global Limited
- China Unicom (Hong Kong) Operations Limited
- ComNet Telecom (HK) Limited
- Easy Tone Network Limited
- Equinix Hong Kong Limited
- HGC Global Communications Limited
- HKBN Enterprise Solutions HK Limited
- HKBN Enterprise Solutions Limited

- HKC Network Limited
- Hong Kong Broadband Network Limited
- Hong Kong Cable Television Limited
- Hong Kong Telecommunications (HKT) Limited
- NTT Com Asia Limited
- PCCW Global (HK) Limited
- PCCW-HKT Telephone Limited and Hong Kong Telecommunications (HKT) Limited
- Reach Networks Hong Kong Limited and Reach Cable Networks Limited
- SmarTone Communications Limited
- Superloop (Hong Kong) Limited
- Telstra International HK Limited and Telstra International Limited
- Towngas Telecommunications Fixed Network Limited
- TraxComm Limited
- Verizon Hong Kong Limited
- Village Telephone Limited
- Vodafone Enterprise Hong Kong Limited

As at March 2020, 90.7% and 79.9% of households were able to enjoy a choice of at least two and three self-built customer access networks respectively. It is expected that the figures will keep growing as the carriers continue to roll out their networks.

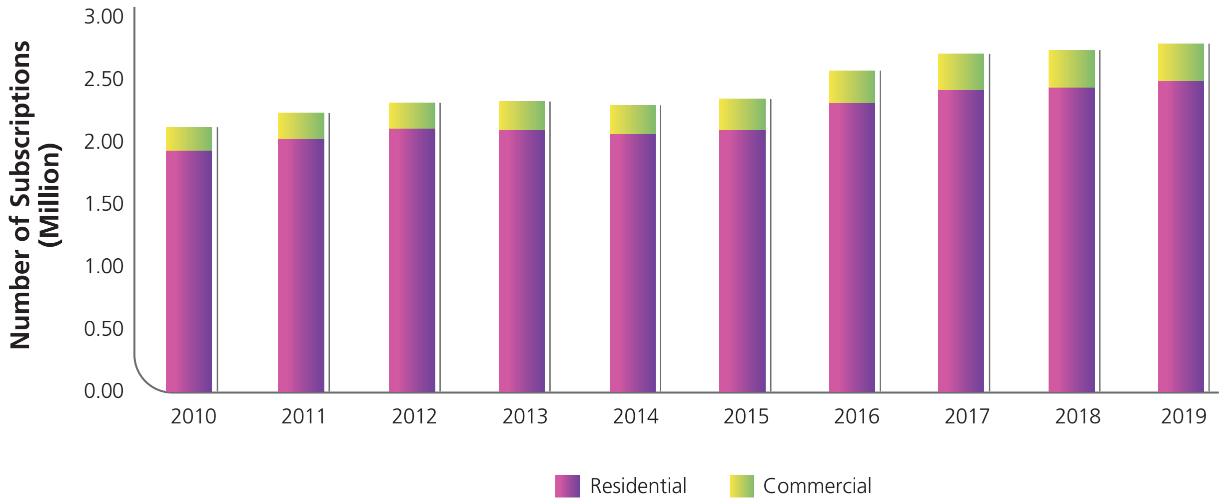
Fixed Broadband Services

As at March 2020, 27 facility-based operators and 226 SBOs were authorised to provide broadband Internet access services in Hong Kong. With the continuous network roll-out of facility-based operators, the Hong Kong community is able to enjoy nearly ubiquitous coverage of broadband networks through the deployment of various technologies including asymmetric digital subscriber line, hybrid fibre coaxial cable, fibre-to-the-building, fibre-to-the-home, etc. Broadband access to various applications and content services has become an integral part of the life of people in Hong Kong. As at March 2020, there were around 2.8 million residential and commercial fixed broadband subscriptions, with a household penetration rate of 94%. Broadband services are available at speeds up to 10 Gbps. Around 82% of the fixed broadband subscriptions are supported by broadband services with speeds of 100 Mbps or above. The statistics of fixed broadband subscriptions as at March 2020 and the statistics for the past 10 years are shown in **Figure 12** and **Figure 13** respectively.

Figure 12: Statistics of Fixed Broadband Subscriptions (as at March 2020)

	No. of subscriptions	% share
Total No. of broadband subscriptions	2 804 790	100%
Broadband speed of 100 Mbps or above	2 301 870	82.1%
Broadband speed below 100 Mbps	502 920	17.9%
Residential	2 492 428	88.9%
Commercial	312 362	11.1%

Figure 13: Fixed Broadband Subscriptions (2010 to 2019)



Internet of Things Services

IoT is a technology which enables the provision of communications platforms and services for interconnected devices to generate, exchange and consume data with minimal human intervention. Currently, both Wireless Internet of Things (WIoT) licensees and MNOs are authorised to provide WIoT services. Since the creation of the WIoT licence in December 2017, three WIoT licences have been issued. With the development of new wireless technologies such as the 5G mobile technologies and smart city applications, it is expected that there will be an increasing number of WIoT devices connecting to the public telecommunications networks in future.

Public WiFi Services

Operators have been actively rolling out WiFi networks. Eight network operators and 183 class licensees are providing public WiFi services in various locations of the territory. As at March 2020, there were 62 105 public WiFi hotspots in the city and the number continued to grow. Free WiFi services were available to the public in 736 government premises.

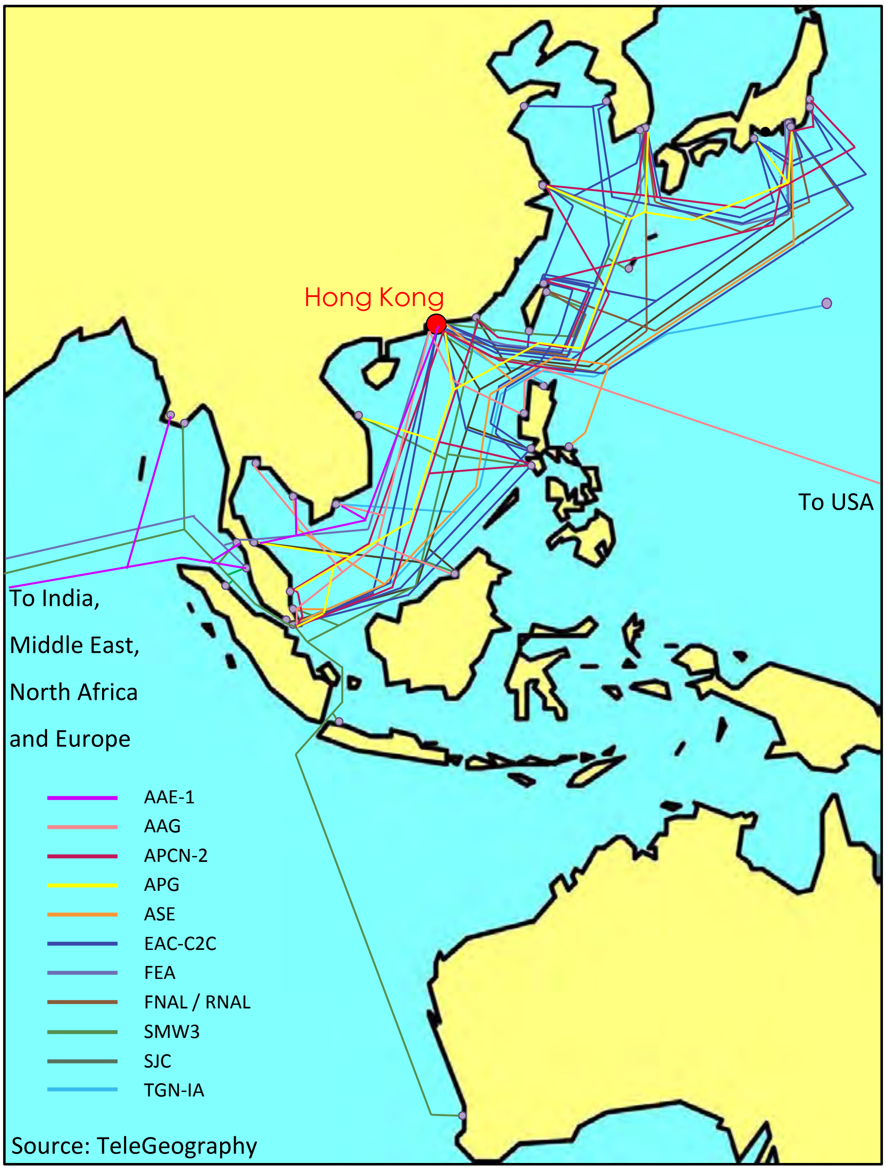
External Telecommunications Services

The external telecommunications facilities market is fully liberalised. As at March 2020, 42 fixed carriers were authorised to provide cable-based and/or non-cable-based external telecommunications facilities.

As at March 2020, there were eight cable landing stations in Hong Kong: two in Tong Fuk, three in Tseung Kwan O and one each in Deep Water Bay, Chung Hom Kok and Cape D'Aguilar, making it a major telecommunications and Internet hub in the region.

In March 2020, Hong Kong was connected to 11 regional and transcontinental submarine cable systems. They are Asia Africa Europe-1 (AAE-1), Asia-America Gateway Cable System (AAG), Asia Pacific Cable Network 2 (APCN-2), Asia Pacific Gateway (APG), Asia Submarine-Cable Express (ASE), EAC - C2C, FLAG Europe Asia (FEA), FLAG North Asia Loop (FNAL)/REACH North Asia Loop (RNAL), Sea-Me-We 3 (SMW3), South-East Asia Japan Cable System (SJC) and TGN-Intra Asia Cable System (TGN-IA). As at March 2020, the total equipped external capacity exceeded 110 226 Gbps. Total external telephone traffic was 2 billion minutes for the period from 1 April 2019 to 31 March 2020. Landing of nine additional submarine cable systems is in the pipeline and they are expected to be ready for service between 2020 and 2023.

Figure 14: Submarine Cables between Hong Kong and Other Economies



Satellite Services

Hong Kong adopts an open sky policy in regulating the provision of satellite services. Satellite-based telecommunications and television broadcasting services are provided via a multitude of satellites in the region with more than 180 transmitting/receiving satellite antennae in earth stations operated by a number of fixed carriers.

Licences are required for the operation of satellites and associated facilities. As at March 2020, two Hong Kong companies were licensed to operate satellites for providing communications services, namely Asia Satellite Telecommunications Company Limited and APT Satellite Company Limited, operating a total of 11 in-orbit satellites.