

CHAPTER 5

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 2021, the total number of free TV, pay TV and non-domestic TV licensees was 15. They provided 591 television channels², of which about 80 non-domestic TV channels were receivable in Hong Kong. An overview of the channels provided by the commercial licensees and RTHK, the public service broadcaster, is shown in **Figure 1**.

Hong Kong implemented full digital TV broadcast on 1 December 2020. As at March 2021, there were three **free TV licensees**, viz. Fantastic TV, HKTVE and TVB. They provided a total of nine digital channels in high definition television (HDTV) format, viz. “Hong Kong Open TV” and “Hong Kong International

Business Channel” (by Fantastic TV), “ViuTV” and “ViuTVsix” (by HKTVE), “Jade”, “Pearl”, “J2”, “TVB News Channel” and “TVB Finance & Information Channel” (by TVB). RTHK, as the public service broadcaster in Hong Kong, provided three digital channels.

As at March 2021, there were two **pay TV licensees**, viz. Hong Kong Cable Television Limited (HKCTV) and PCCW Media Limited (PCCW Media), providing a total of 362 pay television channels and offering a diverse range of local and non-local productions. Among those channels, over 120 were HDTV channels.

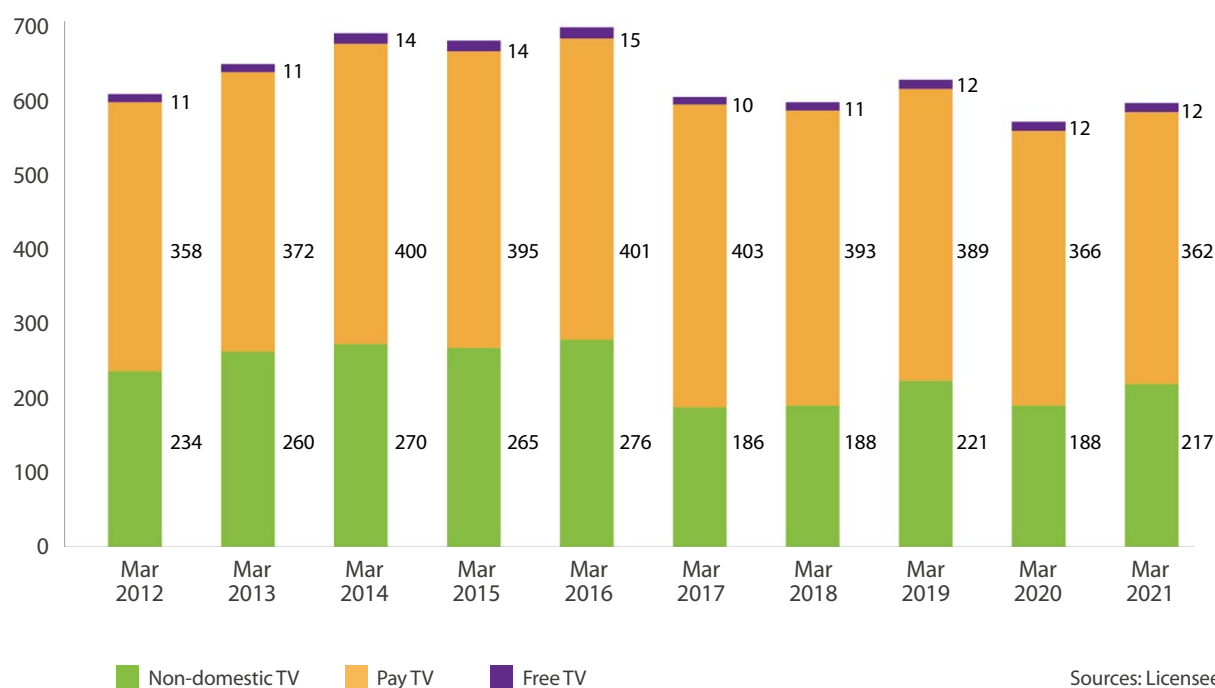
As at March 2021, there were 10 **non-domestic TV licensees** providing over 200 television channels. Hong Kong viewers could receive about 80 of those channels.

During the period under review, there were 20 **other licensable TV licensees** providing television programme services in about 60 hotels in Hong Kong.

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

Figure 1: Television Channels Provided by Commercial Licensees and RTHK in Hong Kong (as at 31 March 2021)

Number of Channels



* While some free TV channels were simulcast in both analogue and digital formats during the period of 2012 to 2020, the total number of free TV channels is calculated by reference to the channels broadcast in digital format only.





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 2021, there were around 400 free-to-air satellite television channels available for reception via the Satellite Master Antenna Television Systems (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, CRHK and Metro. RTHK, as the public service broadcaster, also provided sound broadcasting service.

As at March 2021, 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-neutral³. 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 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**.

³ 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 2021)
Free TV		
TVB	Terrestrial UHF ⁴	99% of population
HKTVE	Terrestrial UHF and Fixed broadband network	99% of population
Fantastic TV	HFC ⁵ and MMDS ⁶	Around 93% of total households
Pay TV		
HKCTV	HFC, MMDS and satellite (Digital)	Around 94% of total households
PCCW Media	PON and DSL ⁷ Broadband network (Digital)	Around 96% of total households
Non-domestic TV		
9 licensees ⁸	Satellite (Digital)	Around 30% of total households ¹¹
1 licensee ⁹	IPLC ¹⁰ and Satellite (Digital)	

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 2021¹².

The penetration of licensed pay TV services was about 78%¹³ of the total households as at end of March 2021. The total number of subscribers to licensed pay TV services stood at about 2.1 million in March 2021¹⁴. The changes in total number of subscribers from 2012 to 2021 are set out in **Figure 3**.

4 Terrestrial Ultra High Frequency

5 Hybrid Fibre Coaxial Cable

6 Microwave Multipoint Distribution System

7 Passive Optical Network and Digital Subscriber Line

8 The licensees concerned are APT Satellite TV Development Limited, Auspicious Colour Limited, Disney Networks Group Asia Pacific Limited (until 14 December 2021), Hong Kong TV International Media Group Limited, One TV Media Global Limited, Phoenix Satellite Television Company Limited, Star China Media Limited, Sun Television Cybernetworks Enterprise Limited and WarnerMedia Asia Pacific (HK) Limited.

9 The licensee concerned is Starbucks (HK) Limited.

10 International Private Lease Circuit

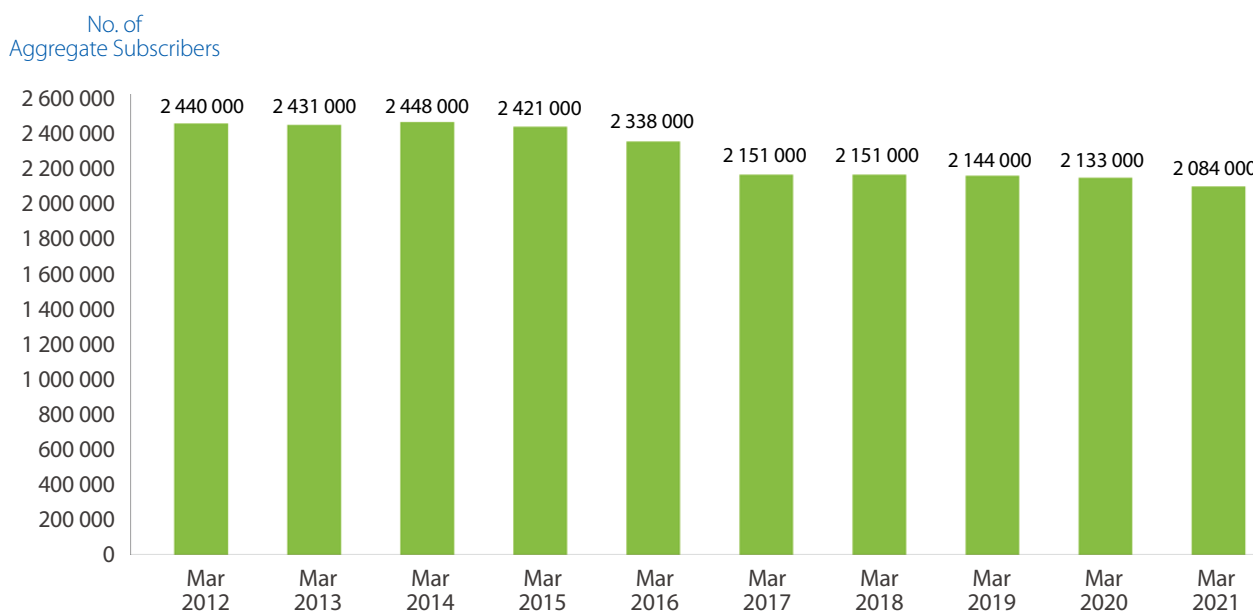
11 The non-domestic TV services mainly serve viewers in the Asia-Pacific region, Europe and Africa and do not target Hong Kong, but some Hong Kong households (around 820,000) can receive the unencrypted channels.

12 Source: HKTAM Establishment Survey, CSM Media Research

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 principal transmitting stations, supplemented by two low-power FM fill-in stations. In addition, six AM programme channels were broadcast from two principal transmitting stations, supplemented by five low-power AM/FM fill-in stations. The services practically covered the whole area of Hong Kong.

5.1.3 Broadcasting Revenues and Investment

Licensed broadcasting services contributed an estimated \$6.21 billion¹⁵ to the Hong Kong economy, which represented about 0.2% of the gross domestic product in 2020. 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 sales¹⁶. 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/event sponsorship, product placement as well as related production fees of advertisements and tailor-made content.

Advertising Revenue

According to the report of admanGo¹⁷, the advertising expenditures on television and radio accounted for 27% (about \$6 billion) and 4% (about \$0.9 billion) respectively of the accumulated \$22.1 billion advertising expenditures in the media in 2020¹⁸.

In 2020, the actual advertising revenues of HKTVE and TVB were around \$271 million and \$881 million 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 “Now TV” brand was \$2.51 billion in 2020.

The subscription revenue of HKCTV was not publicly available.



Investment in Broadcasting Industry

Key investment projects in the television industry in recent years include the digital 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.

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 2021, Fantastic TV, HKTVE and TVB provided 336, 281 and 813 hours of HDTV programmes per week respectively. Fantastic TV and TVB also provided 64 and 995 hours of independent local productions in their programming respectively in 2020 according to their commitments.

As regards the pay TV market, i-CABLE Communications Limited, the parent company of HKCTV, reported in its 2020 Annual Report that the capital expenditure of the group decreased from \$133 million in 2019 to \$100 million in 2020. Its major items of investment included property, plant and equipment. According to the 2020 Annual Report of PCCW, the parent company of PCCW

17 “admanGo” is an advertising monitoring company that provides media monitoring and advertising tracking services across different platforms, including television, radio, print, digital, mobile and social media.

18 Source: Adspend Report for 2020 of admanGo. All the advertising expenditures presented in the report have taken into consideration the discount factor based on an assumption of 75% off rate card rate.



Media, the capital expenditure on its media business decreased from \$213 million in 2019 to \$103 million in 2020. The decrease in capital expenditure for PCCW Media was mainly due to completion of the upgrade of production studio facilities.

On the sound broadcasting side, CRHK and Metro have committed in accordance with CA's approval made in October 2020 and April 2021 to investing a total of \$703 million and \$617 million¹⁹ respectively for the six-year period from 2016 to 2022 covering programming improvement and upgrading of infrastructure and facilities and other developments brought by technological advancement to further enhance their service quality.

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 2021, the licensees broadcast about 67 565 hours of television programmes a week. The nine digital channels of Fantastic TV, HKTVE and TVB provided a total of 1 462 broadcast hours per week, while the 362 channels of the two pay TV licensees provided a total of 52 495 broadcast hours per week. As a public service broadcaster, RTHK provided 504 hours on its three digital channels

¹⁹ The Authority approved in October 2020 and April 2021 respectively that the investment commitment of CRHK be adjusted from \$909 million to \$703 million and the investment commitment of Metro be adjusted from \$685 million to \$617 million.



per week. About 80 channels of non-domestic TV licensees receivable in Hong Kong provided about 13 600 broadcast hours per week.

The total broadcast hours per week provided by CRHK, Metro and RTHK as at March 2021 were 2 184.

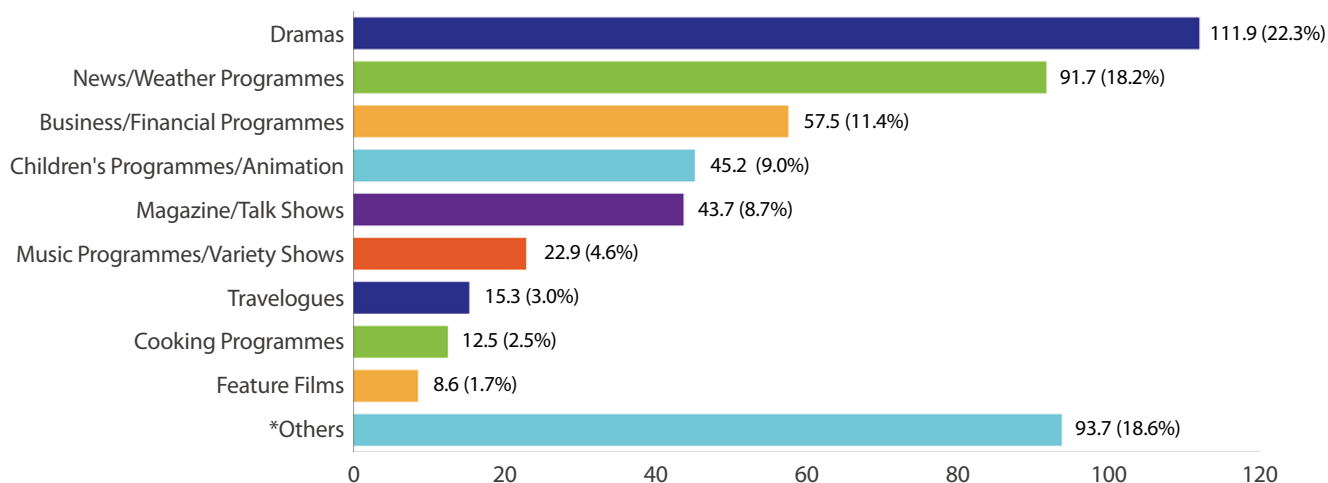
For the period under review, there were a total of 33 341 hours of station productions broadcast on Fantastic TV, HKTVE and TVB. Of the 362 channels provided by pay TV licensees, 78 channels (21.5%) were produced by the licensees themselves.

Free TV Services

Chinese and English Channels

During the period under review, drama series, news/weather programmes and business/financial programmes continue to be 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

Figure 4: Weekly Hours of Different Types of Programmes Broadcast on Hong Kong Open TV, Jade and ViuTV (as at March 2021)



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

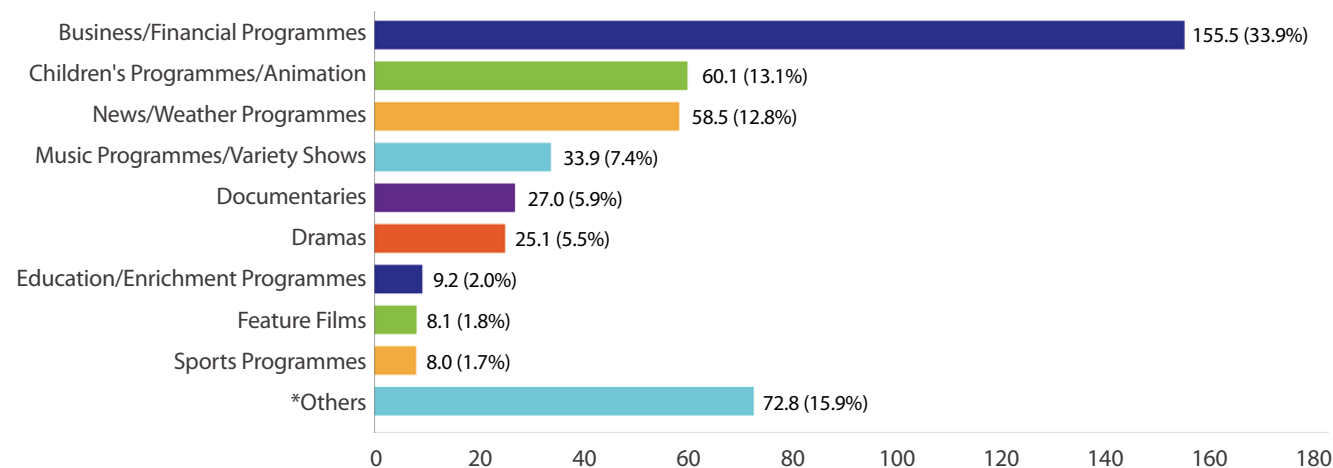
Weekly Total: 503 Hours
Sources: Licensees

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.

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, feature films and sports programmes.



Figure 5: Weekly Hours of Different Types of Programmes Broadcast on Hong Kong International Business Channel, Pearl and ViuTVsix (as at March 2021)



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

Weekly Total: 458.1 Hours
Sources: Licensees



Thematic Channels

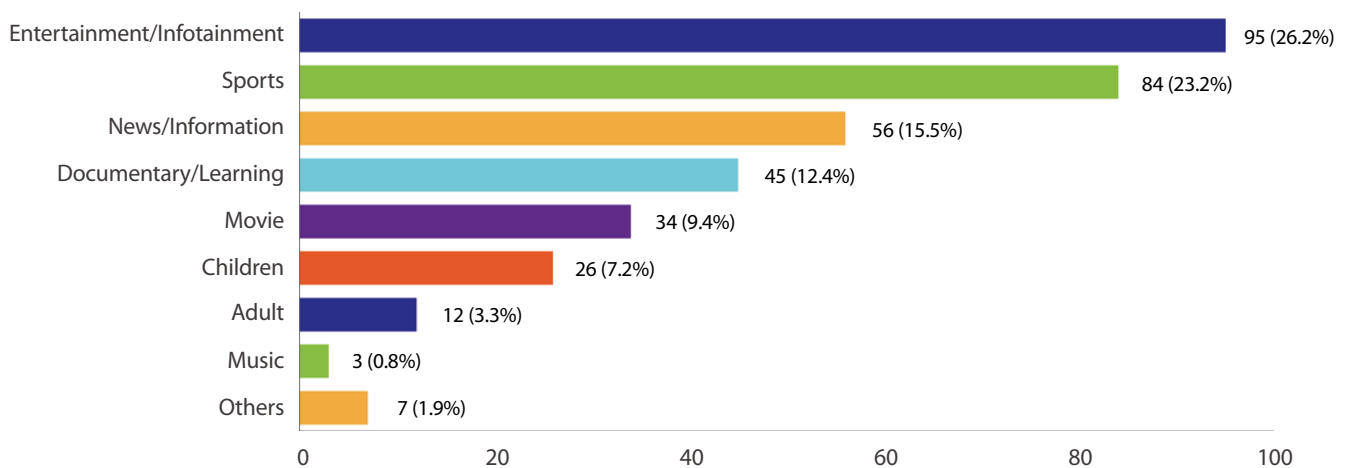
During the period under review, TVB provided acquired dramas, documentaries, variety shows, news, finance information programmes, etc. on "J2", "TVB News Channel" and "TVB Finance & Information Channel".

Pay TV Services

During the period under review, a wide variety of channels were offered on pay TV services, including entertainment/infotainment channels (26.2%), sports channels (23.2%), news/information channels (15.5%), documentary/learning channels (12.4%), and movie channels (9.4%).



Figure 6: Nature of Pay TV Channels (as at March 2021)



Total Number of Channels: 362
Sources: Licensees

As at March 2021, HKCTV offered 135 channels (including 46 HDTV channels). PCCW Media's "Now TV" service offered 162 channels (including 79 HDTV channels) and 65 video-on-demand services.

Sound Broadcasting

As at March 2021, CRHK operated two FM Cantonese channels, viz. "CR1" and "CR2", and one AM English channel, viz. "AM 864". "CR1" mainly provided news, current affairs, financial and personal view programmes. "CR2", targeting younger listeners, featured pop culture and music programmes. "AM864" was primarily a music channel.

Metro operated two FM Cantonese channels, viz. "Metro Finance" and "Metro Info", and one AM English channel, viz. "Metro Plus". "Metro Finance" provided real-time, market-moving news and information on financial markets around the world. "Metro Info" provided music and programmes on lifestyle, health, market news and other information of interest to the public. "Metro Plus" was primarily a music channel which also provided some 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 respectively required to broadcast at least 27.5, 41.5 and 45.5 hours of positive programmes²⁰ per week. They all met the requirements²¹.

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 https://www.coms-auth.hk/en/licensing/broadcasting/compliance_reports/index.html.

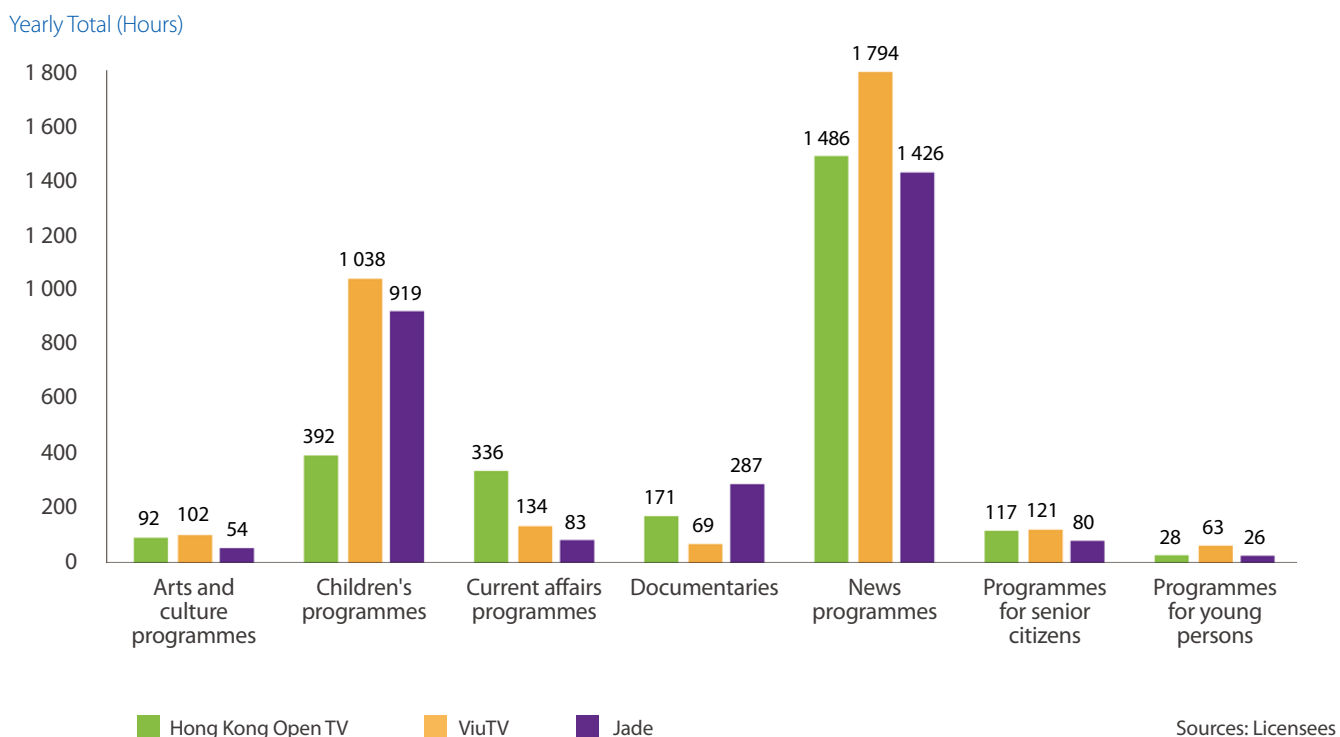


20 The positive programmes that Fantastic TV, HKTVE and TVB were required to broadcast comprised news, current affairs programmes, documentaries, arts and culture programmes, children's programmes and programmes for senior citizens and young persons.

21 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 channels (viz. "J2", "TVB Finance & Information Channel" and "TVB News Channel"). 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 2021)



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 channels²². 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 TVB²³ to provide sign language interpretation, in addition

²² TVB was also required to provide, on its thematic channels, Chinese subtitles for all news, current affairs programmes, weather programmes and emergency announcements as well as programmes broadcast during prime time.

²³ 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.

to subtitles, for a Cantonese news programme broadcast on its “Pearl” channel each day with effect from July 2018. TVB met the requirement.

Pursuant to licence requirements, Fantastic TV, HKTVE and TVB were required to broadcast two minutes of Announcements in the Public Interest (APIs) in every two clock hours 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 channels²⁴. During the period under review, Fantastic TV, HKTVE and TVB broadcast a total of 1 282 hours of the two types of materials²⁵.

Sound Broadcasting

CRHK and Metro were each required to broadcast at least 28.5 hours of positive programmes²⁶ per

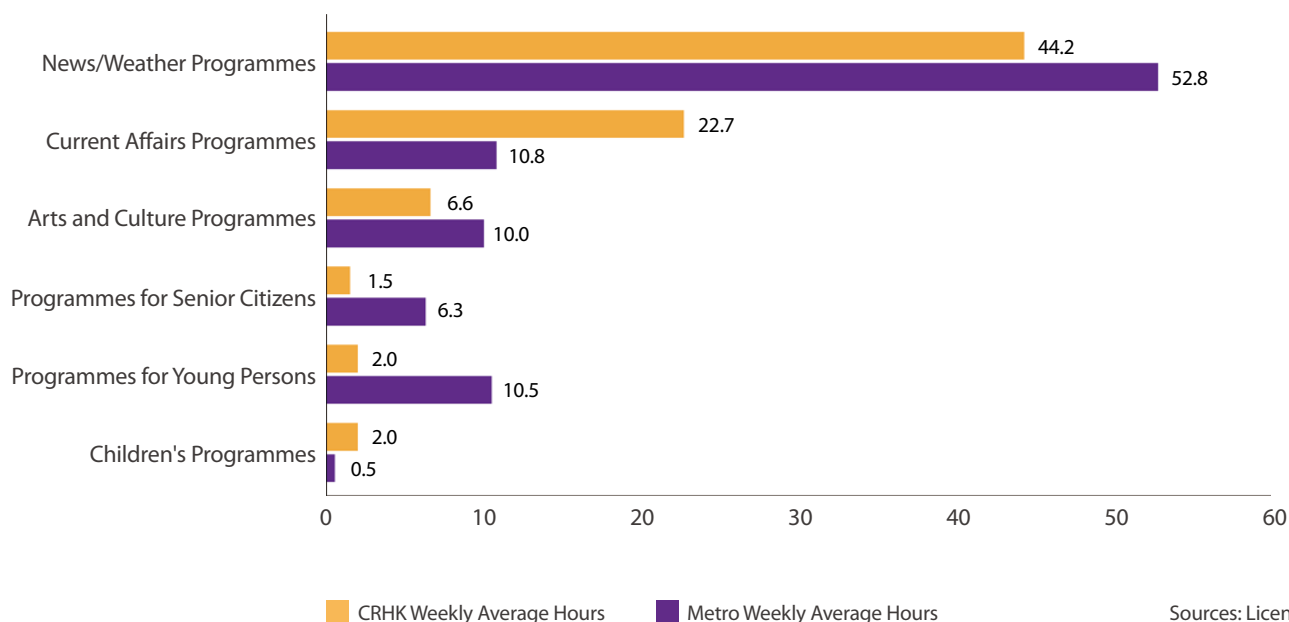


²⁴ TVB was required to broadcast two minutes of publicity material for the Authority per week on its thematic channels.

²⁵ 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.

²⁶ CRHK and Metro were required to broadcast news and weather programmes, current affairs programmes, arts and culture programmes and advisory programmes, viz. programmes for young persons, senior citizens and children, in their respective sound broadcasting service.

Figure 8: Broadcast of Positive Programmes on Sound Broadcasting Services (as at March 2021)

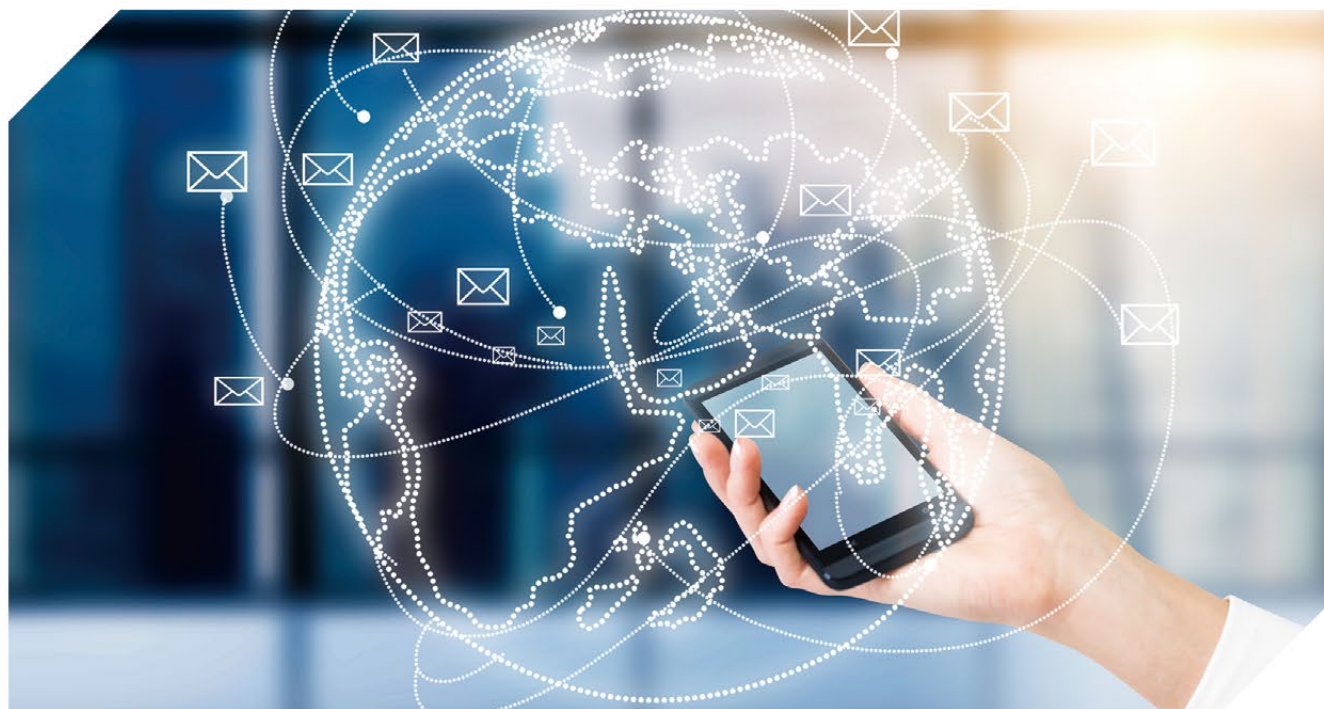


week under their respective licences. During the period under review, CRHK and Metro broadcast the required amount of positive programmes.

CR and Metro also fulfilled the requirements on the broadcast of 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. The reports submitted by the licensees to the Authority on positive programmes are available at https://www.coms-auth.hk/en/licensing/broadcasting/compliance_reports/index.html.

5.1.5 Hong Kong as a Regional Broadcasting Hub

Hong Kong is a broadcasting hub in the Asia-Pacific region. As at March 2021, there were 10 non-domestic TV licensees operating in and broadcasting from Hong Kong. Altogether, they offered around 200 satellite television channels serving viewers in the Asia-Pacific region, Europe and Africa, with about 80 channels receivable in Hong Kong. A summary of the non-domestic TV services as at March 2021 is at **Annex 1**.



Telecommunications

5.2 An Overview of the Telecommunications Market

Hong Kong has one of the most sophisticated and successful telecommunications markets in the world. This has been an important factor in Hong Kong's development as a leading business and financial centre. The telecommunications sector employed around 20 000 persons in 2020, whilst its gross output amounted to \$102 billion in 2019.

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 transmissions and services operated over external facilities such as submarine cable and satellite communications systems. 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 2021, there were a total of 61 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 60 UCL holders, while the remaining

one was a holder of Mobile Carrier Licence, 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 2021, 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 2021, there were a total of 493 SBO licensees.

Class Licences

The class licensing framework does not require any licence applications. Parties meeting the specified eligibility criteria and conditions (including any registration requirement) 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 always been keen. As at March 2021, 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 second generation (2G), 3G, 4G and 5G mobile services in Hong Kong at very affordable prices. As at March 2021, there were about 22.8 million subscriptions to mobile communications services. The mobile subscriber penetration rate²⁷ reached 289.3%, one of the highest in the world. The number of 3G/4G/5G subscriptions totalled 22.7 million in March 2021 and the subscriber penetration rate was 274.1%. Mobile data services were available at downlink speeds of up to 1.1 Gbps. With the continued

²⁷ Calculation of the overall mobile subscriber penetration rate and that for subscribers of 3G/4G/5G services does not include machine type connections.

development of 5G services, even higher speed of mobile communications will be supported.



With an ever growing demand for mobile data services, the monthly mobile data usage surged to 93 937 Terabytes in March 2021, representing 1.2 times and 1.7 times of the monthly usage over the same period in 2020 and 2019 respectively. The mobile data usage per capita reached 12 548 Megabytes in March 2021, compared with 10 055 Megabytes in March 2020 and 7 326 Megabytes in March 2019. The launch of 5G services and development of innovative applications enabled by 5G will continue to boost mobile data usage in the future.

Figure 9: Number of Mobile Subscriptions (2011 to 2020)

Number of Subscriptions in
December (Million)

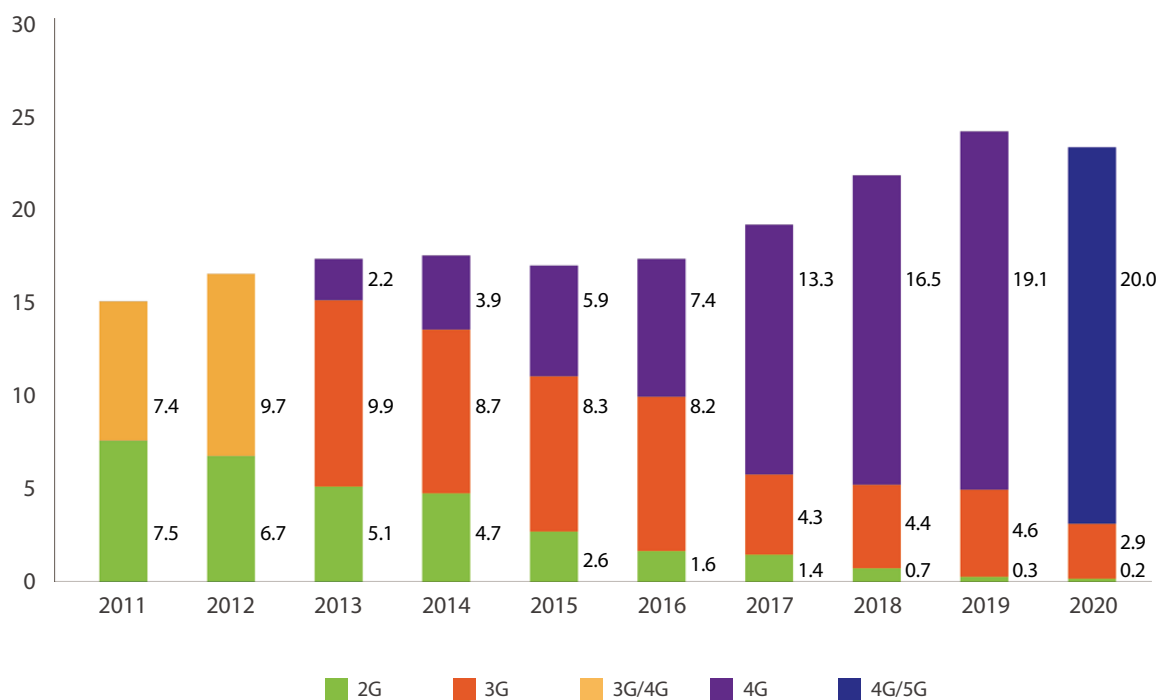


Figure 10: Mobile Subscriptions of Postpaid and Prepaid SIM (2011 to 2020)

Number of Subscriptions in December (Million)

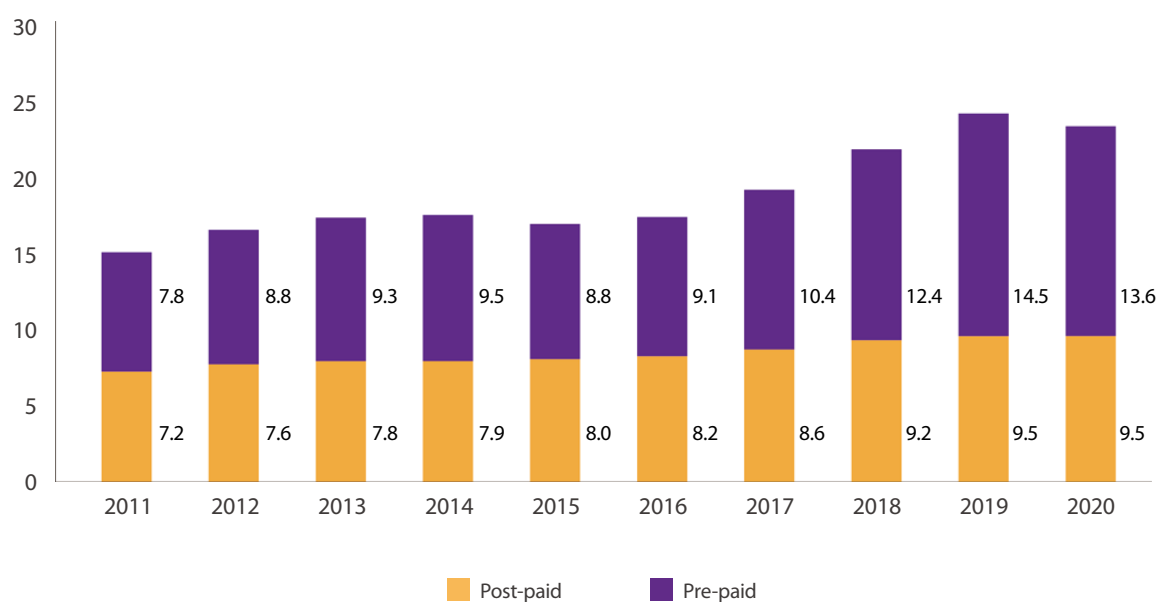
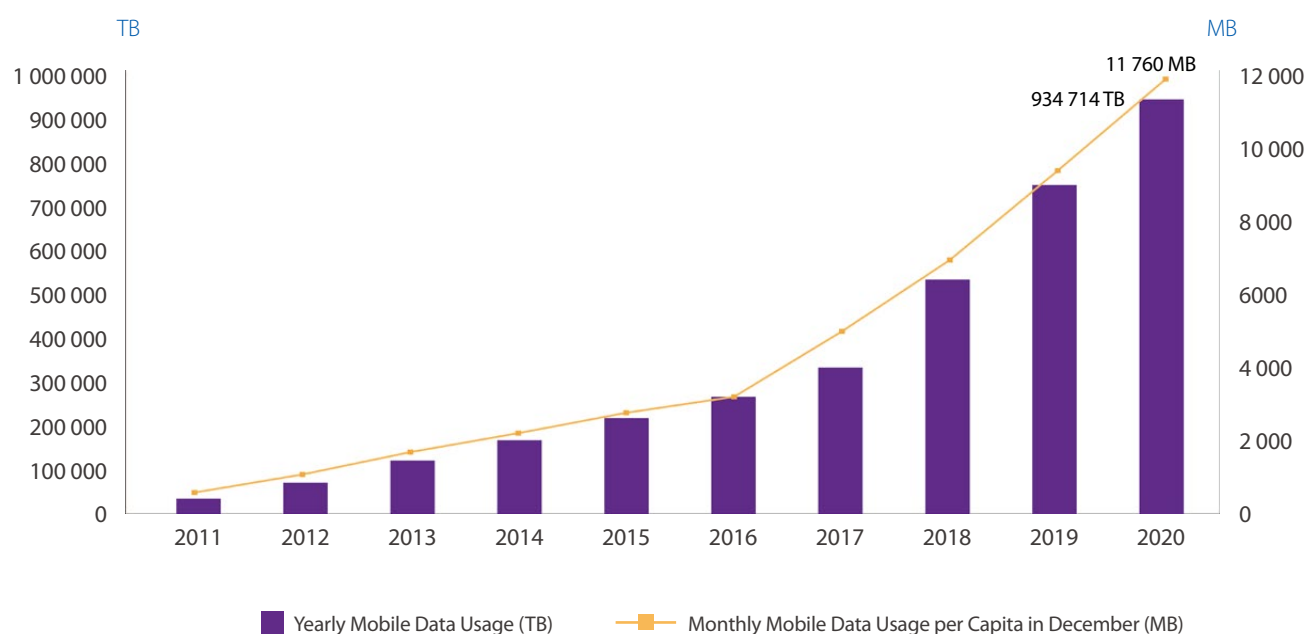


Figure 11: Mobile Data Usage (2011 to 2020)



Fixed Communications Services

The local fixed communications services market has been fully 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 2021, there were 27 local fixed carriers, providing around 81 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 2021, 91% and 80% 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 2021, 27 facility-based operators and 237 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 can 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

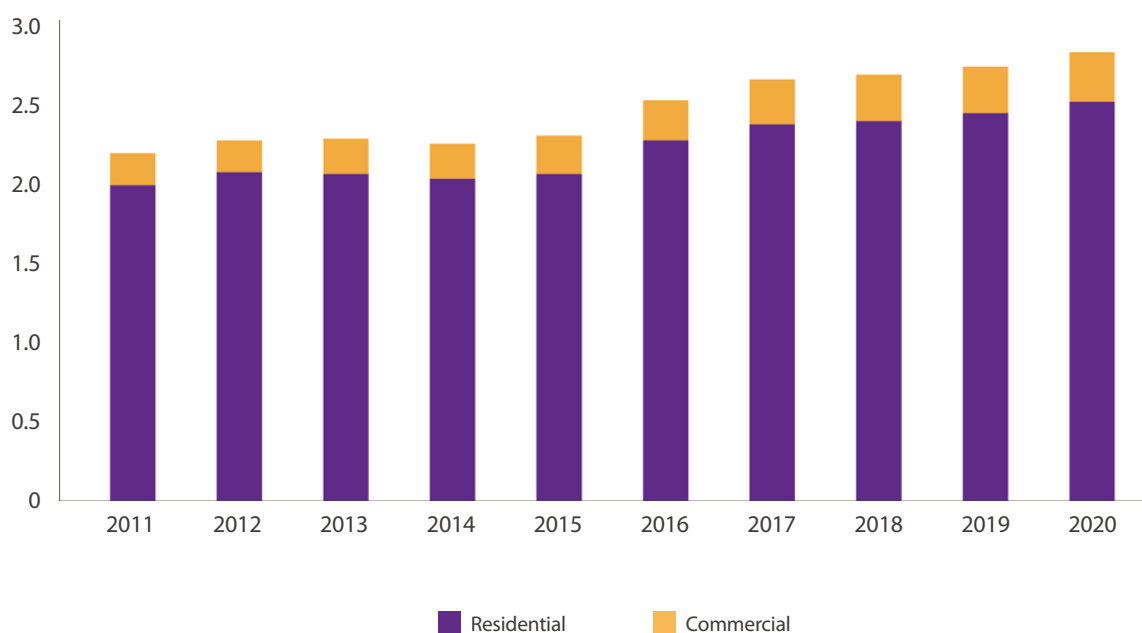
integral part of the life of people in Hong Kong. As at March 2021, there were around 2.9 million residential and commercial fixed broadband subscriptions, with a household penetration rate of 95%. Broadband services are available at speeds up to 10 Gbps. Around 84% of the fixed broadband subscriptions are supported by broadband services with speeds of 100 megabits per second (Mbps) or above. The statistics of fixed broadband subscriptions as at March 2021 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 2021)

	No. of subscriptions	% share
Total No. of broadband subscriptions	2 885 586	100%
Broadband speed of 100 Mbps or above	2 429 734	84.2%
Broadband speed below 100 Mbps	455 852	15.8%
Residential	2 563 863	88.9%
Commercial	321 723	11.1%

Figure 13: Fixed Broadband Subscriptions (2011 to 2020)

Number of Subscribers
(Million)



Internet of Things Services

Internet of Things (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, Wireless Internet of Things (WIoT) licensees, MNOs and MVNOs 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 2021, there were 71 475 public WiFi hotspots in the city and the number continued to grow. Free WiFi services were available to the public in 1 286 government premises.

External Telecommunications Services

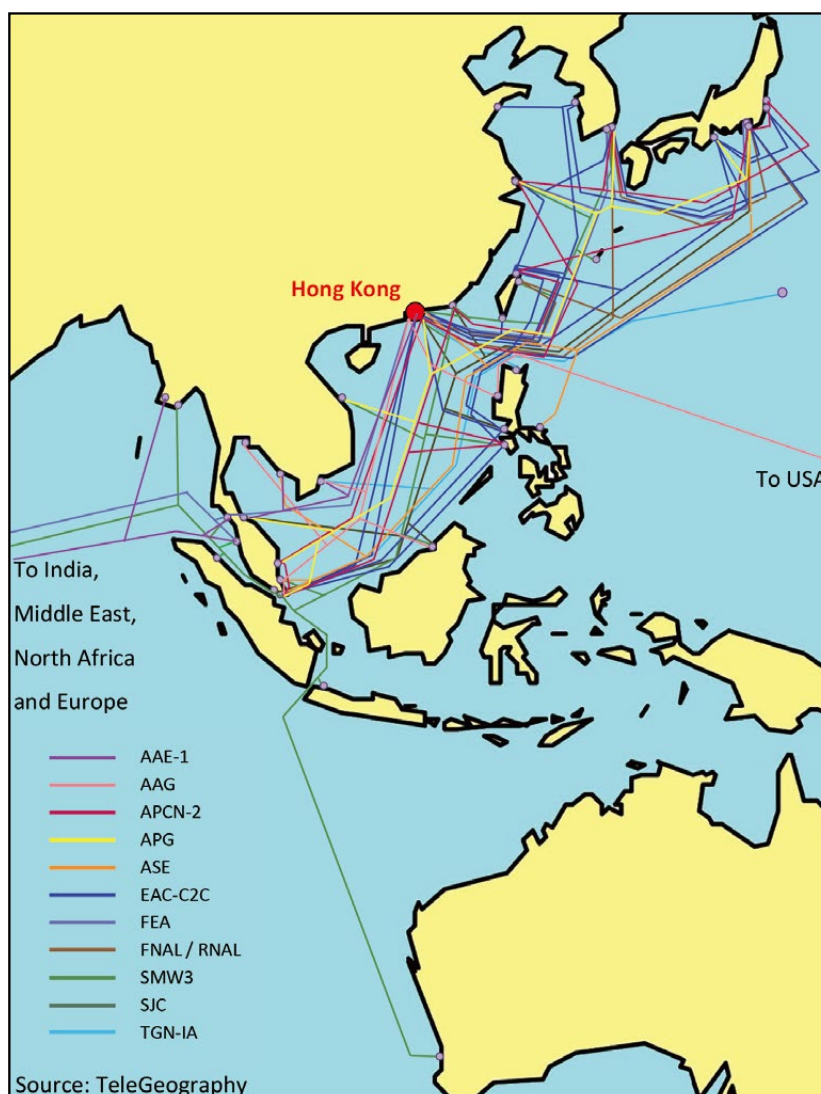
The external telecommunications facilities market has been fully liberalised. As at March 2021, 42 fixed carriers were authorised to provide cable-based and/or non-cable-based external telecommunications facilities.

As at March 2021, 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 2021, 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 2021, the total equipped external capacity exceeded 136 281 Gbps. Total external telephone traffic was 2 billion minutes for the period from



Figure 14: Submarine Cables between Hong Kong and Other Economies



January to December 2020. Landing of some new submarine cable systems is in the pipeline and they are expected to be ready for service between 2021 and 2023.

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 2021, 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 10 in-orbit satellites.