

Chapter 5: Overview of Major Developments in the Communications Market

Broadcasting

5.1 An Overview of Developments in the Broadcasting Market

5.1.1 Number of Licensees and Channels

Television Programme Services

As at March 2016, the total number of free TV, pay TV and non-domestic TV licensees was 24. They provided 693 television channels,³ of which 462 were receivable in Hong Kong, representing an increase of 2.7% since March 2015. An overview of the channels provided by the television programme service licensees is shown in [Figure 1](#).

As at March 2016, there were three **free TV licensees**, viz. ATV,⁴ Television Broadcasts Limited (TVB) and HKTVE. ATV and TVB provided a total of 15 channels. Four channels (“ATV Home”, “ATV World”, “TVB Jade”⁵ and “TVB Pearl”⁵) were simulcast in both analogue and digital formats and seven were digital channels. ATV’s digital channels comprised one HDTV channel “Asia” and three standard definition television (SDTV) channels, namely, “ATV Classic”, “CCTV 1” and “Shenzhen

Satellite”. TVB’s digital channels comprised three HDTV channels, namely, “J2”, “iNews” and “J5”. HKTVE launched its HDTV channel “ViuTV” through a fixed network on 31 March 2016.

As at March 2016, there were three **pay TV licensees**, viz. HKCTV, PCCW Media Limited (PCCW Media) and TVB Network Vision Limited (TVBNV), providing a total of 401 pay television channels, offering a diversity of local and overseas productions. There has been an increase (29%) in the total number of HDTV channels (from 83 to 107) offered by the licensees within the same period.

As at March 2016, the number of **non-domestic TV licensees** remained at 18, providing a total of 276 television channels, 45 channels of which were available to Hong Kong viewers, representing an increase of 4.2% since March 2015.

During the period under review, the number of **other licensable TV licensees** providing television programme services in hotels in Hong Kong decreased by two to 24. Together they provided services to 81 hotels.

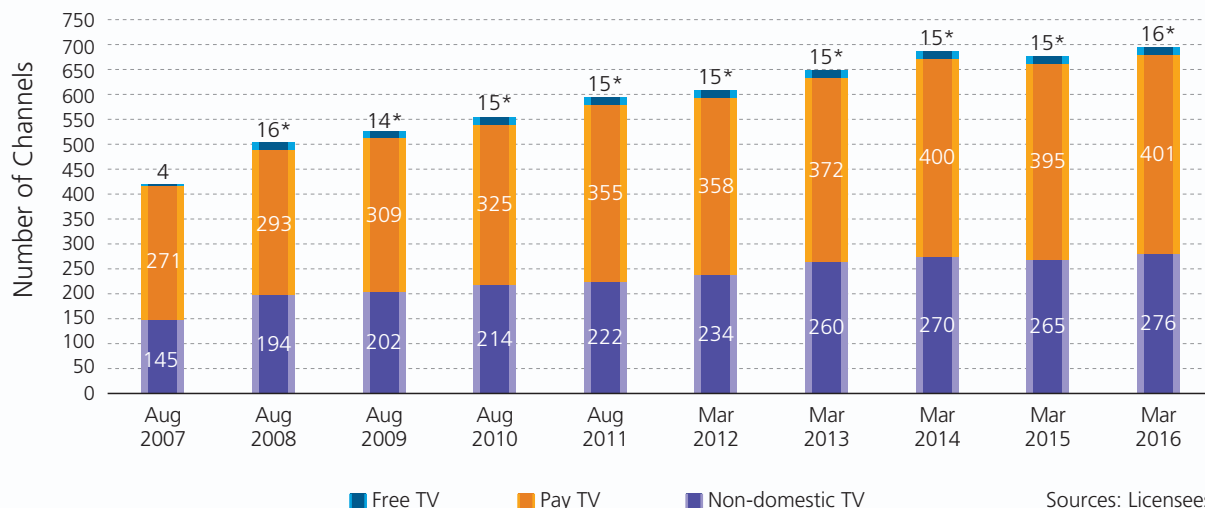


³ Some channels were provided by more than one licensee at the same time.

⁴ In light of the CE in C’s decision not to renew its free TV licence, ATV ceased to provide broadcasting service from 00 hours of 2 April 2016.

⁵ The digital simulcast of TVB “Jade” and “Pearl” channels are broadcast in HDTV format.

Figure 1: Television Channels Provided by Television Programme Service Licensees in Hong Kong



* The four simulcast channels of ATV and TVB are counted for both the analogue and digital platforms.

In addition to the television channels provided by television programme service licensees, Hong Kong viewers can receive free unencrypted satellite television programme channels uplinked from Hong Kong and elsewhere. As at March 2016, there were more than 400 such free-to-air satellite television channels available for reception via the Satellite Master Antenna Television (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

The number of **sound broadcasting licensees** decreased by one⁶ to three during the period

under review, namely, CRHK, Digital Broadcasting Corporation Hong Kong Limited (DBC)⁷ and Metro.⁸ Radio Television Hong Kong (RTHK) is the public service broadcaster in Hong Kong.

As at March 2016, the number of analogue radio channels remained at 13 (three by CRHK, three by Metro and seven by RTHK). On digital audio broadcasting (DAB) services, as at March 2016, the two DAB licensees (DBC and Metro) and RTHK provided a total of 15 DAB channels (seven by DBC, three by Metro and five by RTHK). All analogue and DAB channels provided by the commercial licensees and RTHK were broadcast round-the-clock.

⁶ The CE in C approved the termination of the sound broadcasting licence of Phoenix U Radio Limited with effect from 7 November 2015.

⁷ The CE in C approved the termination of the sound broadcasting licence of DBC with effect from 15 October 2016.

⁸ Metro held two sound broadcasting licences, one for providing AM and FM services and one for providing DAB service. Metro applied on 12 September 2016 for the approval of the CE in C for the termination of its DAB licence.

5.1.2 Transmission Modes

Television

The regulatory regime for television programme services in Hong Kong as enshrined in the BO is technology-neutral.⁹ Licensees are free to choose their transmission arrangements for delivery of television services. Broadcasters can 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 can engage any of the existing carrier licensees to provide the transmission service. Licensees can also provide their television programme services via multiple transmission platforms so as to maximise the coverage.

The transmission modes employed by the television programme service licensees are set out in [Figure 2](#).

Figure 2: Transmission Modes Employed by the Television Programme Service Licensees

Licensee	Transmission Mode	Network Coverage as at March 2016
Free TV		
ATV and TVB	Terrestrial UHF, ¹⁰ including (a) Analogue PAL-I format; and (b) Digital National Standard format	99% of population
HKTVE	(a) Fixed broadband network (from 31 March 2016) (b) Terrestrial UHF (from 2 April 2016)	(a) Around 99% of total households (b) 99% of population
Pay TV		
HKCTV	HFC, ¹¹ MMDS ¹² and satellite (Digital)	Around 96% of total households
PCCW Media	PON and DSL ¹³ Broadband network (Digital)	Around 99% of total households
TVBNV	HFC, satellite and broadband network (Digital)	Around 99% of total households
Non-domestic TV		
All the 18 licensees	Satellite (Digital)	36% of total households (895 963 households)

⁹ An exception is that a service consists only of a service provided on the Internet is exempted from the regulatory regime under the BO.

¹⁰ Terrestrial Ultra High Frequency.

¹¹ Hybrid Fibre Coaxial Cable

¹² Microwave Multipoint Distribution System

¹³ Passive Optical Network and Digital Subscriber Line

Penetration of Different Broadcasting Services

In March 2016, out of a total of 2.48 million households in Hong Kong,¹⁴ 2.46 million television households¹⁵ or 6.49 million viewers (aged 4 or above)¹⁶ could receive analogue broadcasting of free-to-air television, representing a penetration rate of about 99%. As regards digital terrestrial television (DTT) services, the take-up rate was close to 85% of all the households in December 2015.¹⁷

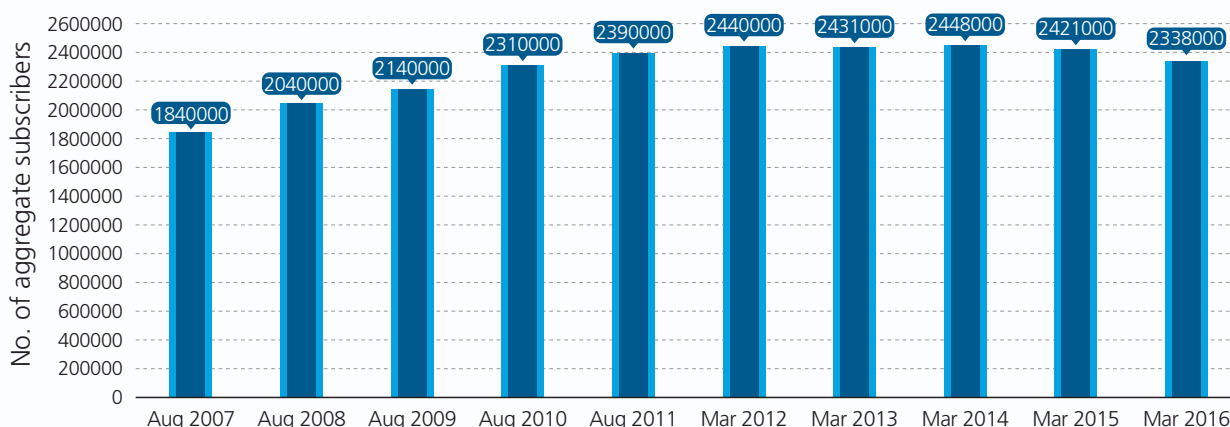
The penetration of licensed pay TV services was over 94%¹⁸ of the total households as at end of March 2016. The total number of subscribers to licensed pay TV services stood at over 2 300 000 in March 2016.¹⁹ The changes in total number of subscribers from 2007 to 2016 are shown in Figure 3.

Sound Broadcasting

During the period under review, the analogue radio broadcasters provided their services in FM and AM modes. Seven FM programme channels were provided through seven hilltop sites and 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 to improve the AM programme services. The services practically covered the whole territory of Hong Kong.

The DAB broadcasters adopted DAB+ standard for transmission of DAB services. The DAB transmission network comprising seven principal transmitting

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



Sources: Licensees

14 Source: Census and Statistics Department.

15 "Television households" means households with at least one television set currently in working order; or with one not in working order but will repair or renew in near future. Data Source: The Nielsen Company (Hong Kong) Limited.

16 Data Source: The Nielsen Company (Hong Kong) Limited.

17 According to a public survey conducted in December 2015, close to 85% of households in Hong Kong were receiving DTT services.

18 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.

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

stations²⁰ was officially launched in June 2012. Three new DAB gap-fillers were completed in 2015. As at March 2016, the coverage of the DAB service was about 86%.

5.1.3 Broadcasting Revenues and Investment

Licensed broadcasting services contributed an estimated \$7.6 billion²¹ to the Hong Kong economy, which represented about 0.32% of the gross domestic product in 2015. There are two main sources of revenues for the provision of broadcasting services, viz. advertising and subscription. The income of free TV licensees and sound broadcasting licensees mainly come from sales of advertising spots within programme breaks. Pay TV licensees, on the other hand, derive their incomes mainly from subscription fees while sales of advertising spots remains a secondary income source.

Advertising Revenue

According to the report of AdmanGo Limited, the advertising expenditures on television and radio accounted for 31% (about \$14.26 billion) and 4% (about \$1.84 billion) respectively of the accumulated \$46 billion advertising expenditures in the media in 2015.²²

In 2015, the actual advertising revenue of TVB was around \$3.06 billion.²³ The actual advertising revenues of the other licensees were not publicly available.

Subscription Revenue

According to the annual report of i-Cable Communications Limited (i-Cable), the parent company of HKCTV, HKCTV's turnover (including mainly subscription revenue and also some advertising revenue) was \$1.13 billion in 2015, representing a decrease of 11% over the figure in 2014. The decrease was mainly due to lower subscription and advertising 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" brand was \$2.94 billion in 2015, representing an increase of 1% over the figure in 2014.

The subscription revenue of TVBNV is not publicly available.



²⁰ Beacon Hill, Castle Peak, Cloudy Hill, Golden Hill, Kowloon Peak, Lamma Island and Mount Gough.

²¹ Source: Company reports of major broadcasting licensees.

²² Source: Adspend Report for 2015 of AdmanGo Limited. All the advertising expenditures presented in the report have taken into consideration the discount factor based on an assumption of 60% off rate card rate.

²³ According to TVB's annual report 2015, the turnover from the Hong Kong television broadcasting business segment was \$3,062 million, which comprised advertising revenue from the Group's free and pay television channels.

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. In addition, with the increasingly competitive television industry, the exclusive rights to broadcast premium contents such as sports events have been a major attraction to viewers.

HKTVE and TVB have committed to investing a total of \$1.5 billion for the six-year period from 2015 to 2020 and \$6.3 billion for the six-year period from 2016 to 2021 respectively for the provision of free TV services. HKTVE's investment commitment comprises capital expenditures and programming expenditures. TVB's investment commitment mainly covers the maintenance of its infrastructure and transmission facilities. TVB has also committed to a progressive increase in the amount of independent local productions in programming. As at March 2016, ATV and TVB provided a total of 71²⁴ and 792 hours of HDTV programmes per week respectively.

As regards the pay TV market, i-Cable, the parent company of HKCTV, reported in its 2015 Final Results Announcement that the capital expenditure of the group for the year had increased from \$188 million in 2014 to \$207 million in 2015. Its major items of investment included television production and broadcast facilities. According to the 2015 Annual Results of PCCW, the parent company of PCCW Media, the capital expenditure for the year on its media business was \$234 million, representing an increase of 46% over the figure in the previous year. Its major items of investment

included acquisition of premium programming and content production.

TVBNV has committed to investing a total of \$2.003 billion for the six-year period from 2013 to 2019. The investment commitment of TVBNV covers HDTV programming, set-top-boxes and broadcast facilities upgrading for employing the fixed hybrid optical fibre network provided by Hutchison Global Communications Limited to deliver its pay TV service.

CRHK and Metro have committed to investing a total of \$827 million and \$677 million respectively for the period from 2010 to 2016 for the provision of analogue sound broadcasting services. The investment commitment of CRHK and Metro covers staff development, facilities upgrading, programming improvement and other development brought by technological advancement to further enhance their service quality. The two DAB licensees, namely, DBC and Metro, have committed to investing a total of \$391 million and \$96.1 million respectively for the period from 2011 to 2017. Their investment commitment mainly covers construction of DAB network and studio facilities and production of DAB programmes.



²⁴ Updated information from ATV as at March 2016 is not available. It is an estimated figure based on ATV's submission for March 2015.

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 2016, the licensees broadcast about 69 822 hours of television programmes a week.²⁵ Among them, ATV and TVB provided a total of 671 broadcast hours per week on the four analogue channels and 1 845 broadcast hours per week on the eleven digital channels, while the 401 channels of the three pay TV licensees provided a total of 59 746 broadcast hours per week. As at March 2016, the 45 channels of non-domestic TV licensees receivable in Hong Kong provided a total of 7 560 broadcast hours per week.

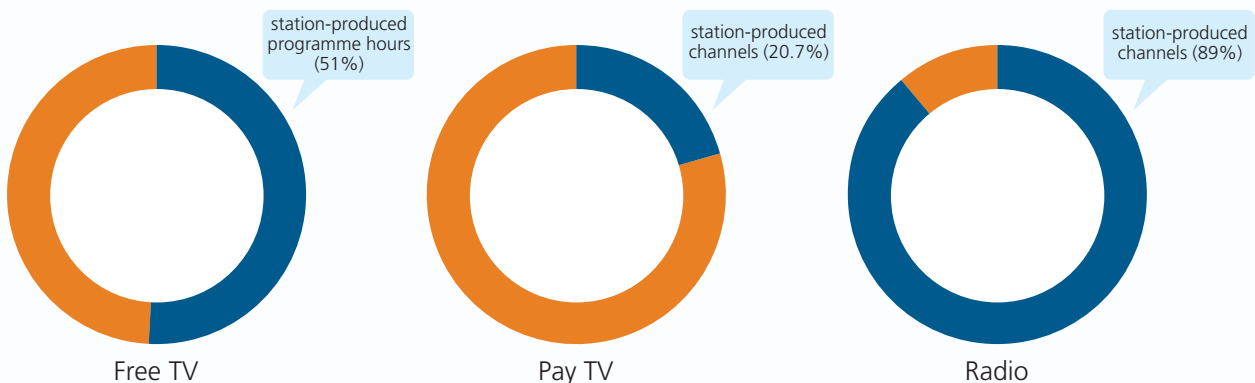
The weekly number of broadcast hours for analogue and DAB sound broadcasting services (including

RTHK) as at March 2016 was 4 704. The 13 analogue channels of sound broadcasting operators provided a total of 2 184 broadcast hours per week while the 15 digital channels provided a total of 2 520 broadcast hours per week.

For the period under review, there were a total of 68 785²⁶ hours of station productions broadcast on ATV and TVB, of which 19 229 hours were on analogue channels and 49 556 on digital channels. Of the 401 channels provided by the pay TV licensees, 83 channels (21%) were produced by the licensees themselves.

As for sound broadcasting services, with the exception of RTHK’s relay of BBC World Service on Radio 6 and its digital radio services, and programmes of “China National Radio” on its digital radio services, the other 12 analogue radio channels and 13 digital radio channels (89% of all relevant channels) were mainly produced by the broadcasters themselves.

Figure 4: Proportion of Station Production in March 2016²⁷



Sources: Licensees

²⁵ Updated information from ATV as at March 2016 is not available. The weekly total number is estimated on the basis of the latest submissions of TVB, pay TV licensees and the available information in respect of non-domestic TV licensees as well as ATV’s submission for March 2015.

²⁶ Updated information from ATV as at March 2016 is not available. The figure is estimated on the basis of TVB’s latest submission and ATV’s submission for March 2015.

²⁷ Updated information from ATV as at March 2016 is not available. Figures are estimated on the basis of TVB’s latest submission and ATV’s submission for March 2015.

Free TV Services

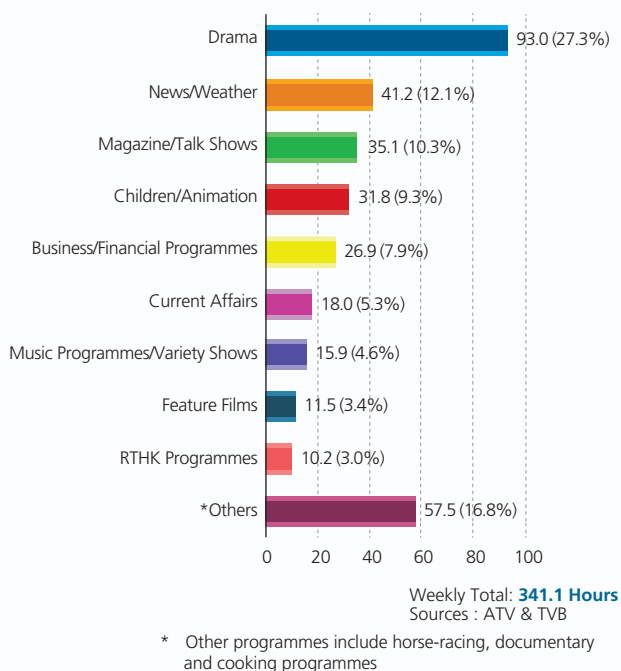
Analogue Channels and Digital Simulcast Channels

During the period under review, drama series and magazine/talk shows were the dominating programme genres during prime time on the Cantonese channels. Drama series on TVB were mostly in-house productions. Both licensees broadcast Mainland, Korean and Japanese drama series. Apart from drama series and magazine/talk

shows, business/financial programmes, feature films and variety shows, etc. were also broadcast during prime time on the Cantonese channels.

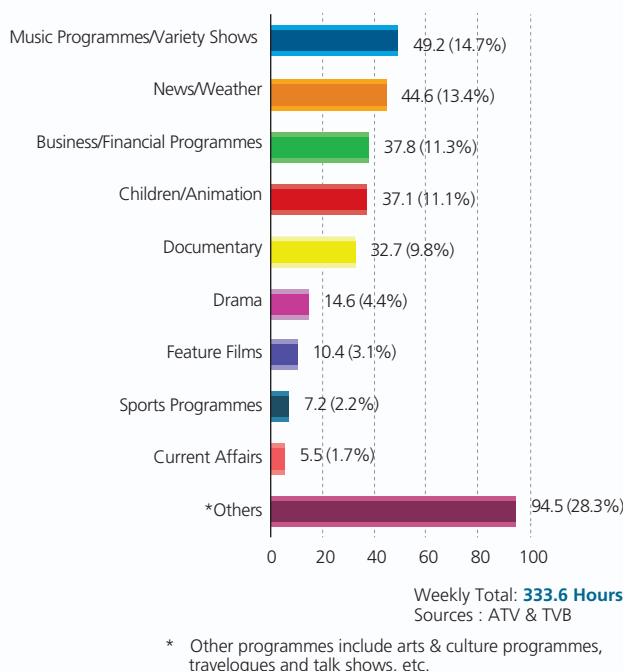
The English channels broadcast a wide range of programmes, including business/financial programmes, music programmes/variety shows, children’s animations, imported popular drama series, documentaries, sports programmes, feature films and current affairs programmes.

Figure 5: Weekly Hours of Different Programme Types Broadcast on ATV Home and TVB Jade as at March 2016²⁸



28 Updated information from ATV as at March 2016 is not available. The figure is estimated on the basis of TVB’s latest submission and ATV’s submission for March 2015.

Figure 6: Weekly Hours of Different Programme Types Broadcast on ATV World and TVB Pearl as at March 2016²⁹



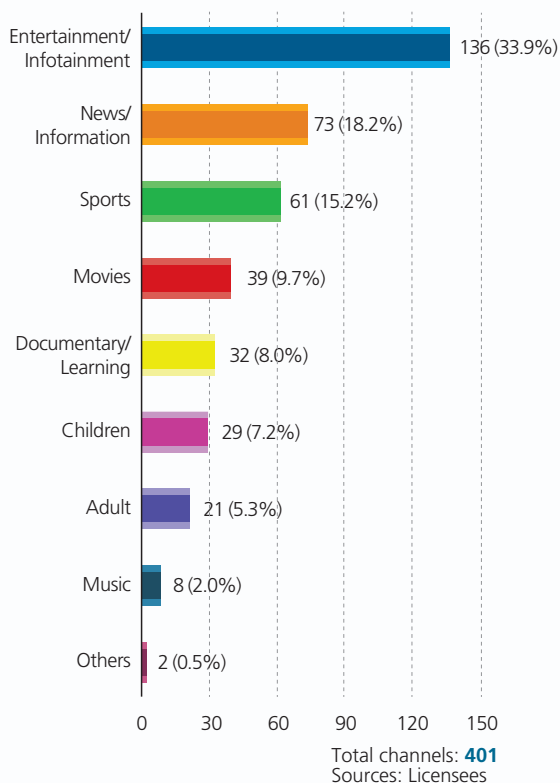
29 Updated information from ATV as at March 2016 is not available. The figure is estimated on the basis of TVB’s latest submission and ATV’s submission for March 2015.

Digital Channels

Since the launch of DTT services, ATV and TVB have been providing more service channels to viewers. As at March 2016, ATV provided HDTV “Asia” channel, “ATV Classic”, “CCTV 1” and “Shenzhen Satellite”, all of which were general entertainment channels. TVB provided dramas, variety shows, news, talk shows and game shows, etc. via “J2”, “i-News” and “J5”.

On 31 March 2016, HKTVE started to provide one general entertainment channel, “ViuTV”.

Figure 7: Nature of Pay TV Channels as at March 2016



Pay TV Services

During the period under review, a wide variety of channels were offered on pay TV services, including entertainment/infotainment channels (33.9%), news/information channels (18.2%), sports channels (15.2%), movie channels (9.7%), and documentaries/learning channels (8.0%).

As at March 2016, HKCTV offered a basic package consisting of 74 basic channels and 36 other premium channels (including 14 HDTV channels). PCCW Media’s “now TV” service offered 178 channels (including 70 HDTV channels) and 48 video-on-demand services, while TVBNV’s service comprised 65 channels (including 23 HDTV channels), of which 17 were also carried on PCCW Media’s platform.

Sound Broadcasting

Analogue Channels

As at March 2016, CRHK operated two FM Cantonese language services, viz. “CR1” and “CR2”, and one AM English language service, “AM 864”. “CR1” provided mainly 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, Indonesian, Pakistani 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.



Digital Channels

As at end March 2016, DBC operated seven channels comprising “Radio Prime”, “me2”, “Radio Business”, “Chinese Music Channel”, “Radio Smiles”, “International Music Channel” and “Chinese Opera Channel”. The seven channels offered programmes of different varieties, including current affairs and commentary, news, talk shows, financial information, entertainment, education, art and culture, music and programmes for ethnic minorities in different languages including Filipino, Hindi, Indonesian, Thai and Urdu.

As at end March 2016, Metro operated three DAB channels, namely, “Metro Finance Digital”, “Metro Music Digital” and “Metro Life Digital”. The channels primarily offered finance programmes, talk shows, music shows and lifestyle programmes mainly in Cantonese.

As at end March 2016, RTHK operated five channels, four of which principally simulcast existing AM channels and the remaining one was a dedicated channel produced by “China National Radio” for RTHK.

(b) Positive Programme Requirements

During the period under review, free TV licensees were required to broadcast at least 41.5 hours of positive programmes³⁰ per week. While TVB met the requirements,³¹ ATV ceased to provide two comprehensive news bulletins on its Cantonese and English Channels as per the requirement under its free TV licence in February and March 2016.³² HKTVE broadcast a weekly average of 22 hours of positive programmes on its Cantonese channel starting from 2 April 2016.

The reports submitted by the licensees to the Authority on four types of positive programmes, viz. 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.

Free TV licensees were required to provide Chinese subtitles for all news, current affairs, weather reports and emergency announcements as well as programmes broadcast during prime time (7:00 p.m. to 11:00 p.m.) on Cantonese channels, and English subtitles for all news, current affairs, weather programmes, emergency announcements and educational programmes for teenagers (two hours per week) on English channels. The licensees

³⁰ The positive programmes that ATV and TVB were required to broadcast included news, current affairs programmes, documentary, art and culture programmes, children’s programmes and programmes for senior citizens and young persons.

³¹ TVB was required to broadcast at least 45.5 hours of positive programmes per week, including an additional 4 hours on its thematic digital channels (i.e. “J2”, “J5” and “iNews”) when its renewed free TV licence took effect on 1 December 2015.

³² ATV failed to broadcast comprehensive news bulletins on its “Home Channel” from 6 February 2016 to 19 February 2016, and on its “World Channel” from 6 February 2016 up to 1 April 2016, the last day on which ATV provided its licensed free TV service. Details are set out in Chapter 6.16.

were also required to provide Chinese subtitling for all drama programmes on Cantonese channels and English subtitling for all programmes broadcast on English channels between 8:00 p.m. and 11:30 p.m. Overall, both ATV and TVB complied with the requirements on provision of subtitles. Since 2 April 2016, HKTVE has been subject to the same subtitling requirements.

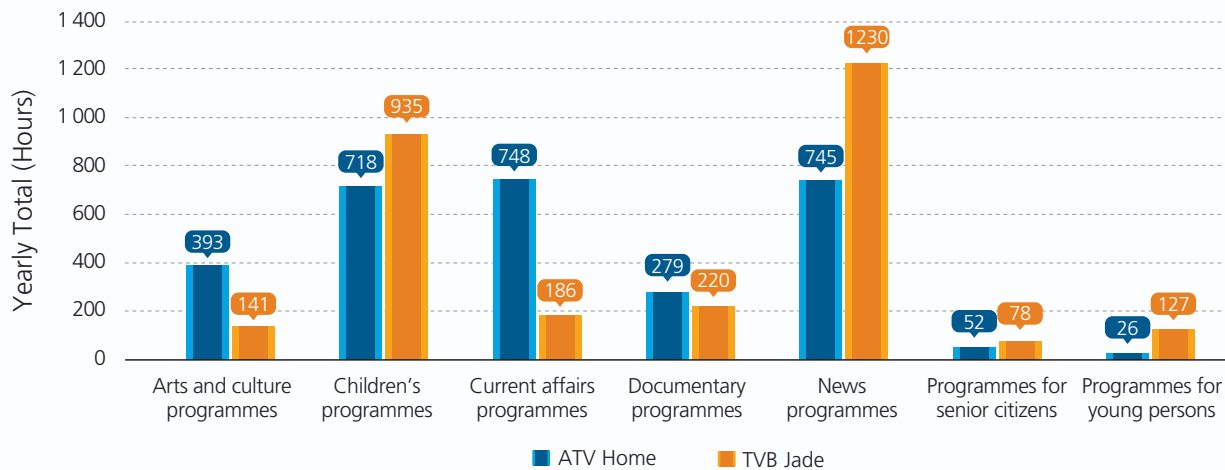
Pursuant to licence requirements, ATV and TVB were required to broadcast one minute of Announcements in Public Interest (APIs) in each hour for each channel. Also, they are required to broadcast, on a weekly basis, not more than five minutes in aggregate of publicity material for the Authority for each analogue/simulcast digital channel.³⁴ During the period under review, ATV and TVB broadcast a total of 1 804 hours of the two

types of materials.³⁵ Since 31 March 2016, HKTVE has been subject to the same requirements on broadcast of APIs and publicity materials.

As regards sound broadcasting services, analogue sound broadcasting licensees were required to broadcast at least 28.5 hours of positive programmes³⁶ per week. CRHK and Metro reported that they had complied with the licence conditions on broadcast of positive programmes.

All sound broadcasting licensees (including DAB 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 in each service channel. All licensees reported that they had complied with the requirements.

Figure 8: Broadcast of Positive Programmes on Cantonese Channels of ATV and TVB as at March 2016³³



Sources: ATV & TVB

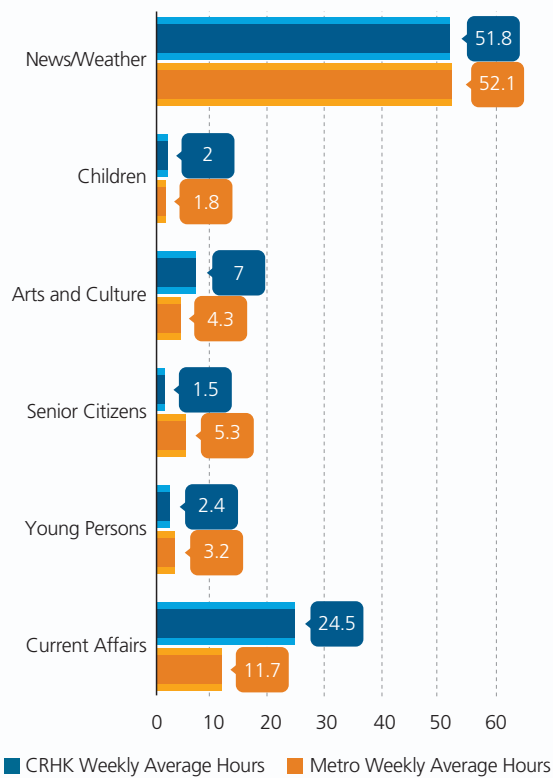
³³ Updated information from ATV as at March 2016 is not available. Figures are estimated on the basis of TVB's latest submission and ATV's submission for March 2015.

³⁴ Both licensees are also required to broadcast two minutes of publicity material for the Authority on other digital channels per week.

³⁵ Updated information from ATV as at March 2016 is not available. Figures are estimated on the basis of TVB's latest submission and ATV's submission for March 2015.

³⁶ The positive programmes that CRHK and Metro were required to broadcast included news and weather programmes, current affairs programmes, art and culture programmes and advisory programmes, viz. programmes for young persons, senior citizens and children.

Figure 9: Broadcast of Positive Programmes on Sound Broadcasting Services as at March 2016



5.1.5 Hong Kong as a Regional Broadcasting Hub

Hong Kong is a broadcasting hub in the Asia-Pacific region with 18 non-domestic TV licensees operating in and broadcasting from Hong Kong. Altogether they offered a total of 276 satellite television channels serving over 300 million viewers in the Asia-Pacific region, Europe and Africa, of which 45 channels were receivable in Hong Kong. A summary of non-domestic TV services as at March 2016 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 2014, the gross output of the telecommunications sector amounted to \$89 billion and it employed around 18 700 persons.

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

5.2.1 The Telecommunications Regulatory Regime

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 regime 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 as well as external 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.

Fixed Carrier Licences (FCLs) and Mobile Carrier Licences (MCLs) which were issued before the introduction of the UCL remain valid until their expiry dates. The holders of FCL and MCL may apply to the Authority for UCL to replace their licences before or upon expiry.

As at March 2016, there were a total of 60 carrier licensees, providing local fixed services, cable-based external fixed services, non cable-based external fixed services and/or mobile services.

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 and public mobile radio data 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 2016, there were a total of nine PRS licensees.



Services-based Operator Licences

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

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, mobile virtual network operator 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 2016, there were a total of 537 SBO licensees.

Class Licences

The class licensing regime does not require any licence application. Parties meeting the specified eligibility criteria and conditions would 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 seven types of Class Licences:

- 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 are at **Annex 2**.

5.2.2 Developments in the Telecommunications Market and Technology Trends

Mobile Communications Services

Competition in public mobile services is keen. As at March 2016, four mobile network operators, namely, China Mobile Hong Kong Company Limited (CMHK), Hong Kong Telecommunications (HKT) Limited (HKT), Hutchison Telephone Company Limited (HTCL) and SmarTone Mobile Communications Limited (SmarTone), were providing a wide range of public mobile services. The availability of mobile number portability since March 1999 has contributed to promoting effective competition among the mobile network operators as it enables customers to retain their telephone numbers when they switch to another mobile network operator.

The four mobile network operators provide second generation (2G), 3G and 4G services in Hong Kong at very affordable prices. As at March 2016, there were about 17 million subscribers to mobile communications services. This represents a population penetration of 228.3%, one of the highest in the world. The number of 3G/4G users reached 14.69 million in March 2016, representing a population penetration of 200.6%. Through spectrum refarming, more spectrum is now used for provision of 4G services with a downlink speed up to 375 Mbps.

With the increasing popularity of smart phones, particularly 4G mobile handsets which were readily available in the market, the monthly mobile data usage surged to 20 557 Terabytes in March 2016, representing 1.2 times and 1.6 times the monthly usage over the same period in 2015 and 2014 respectively. On average, each mobile user used 1 358 Megabytes per month, compared with 1 327 Megabytes in March 2015 and 1 046 Megabytes in March 2014. The continued development of 4G mobile services is expected to further boost the mobile data usage in the future.

Figure 10: Number of Mobile Subscribers (2006 to 2015)

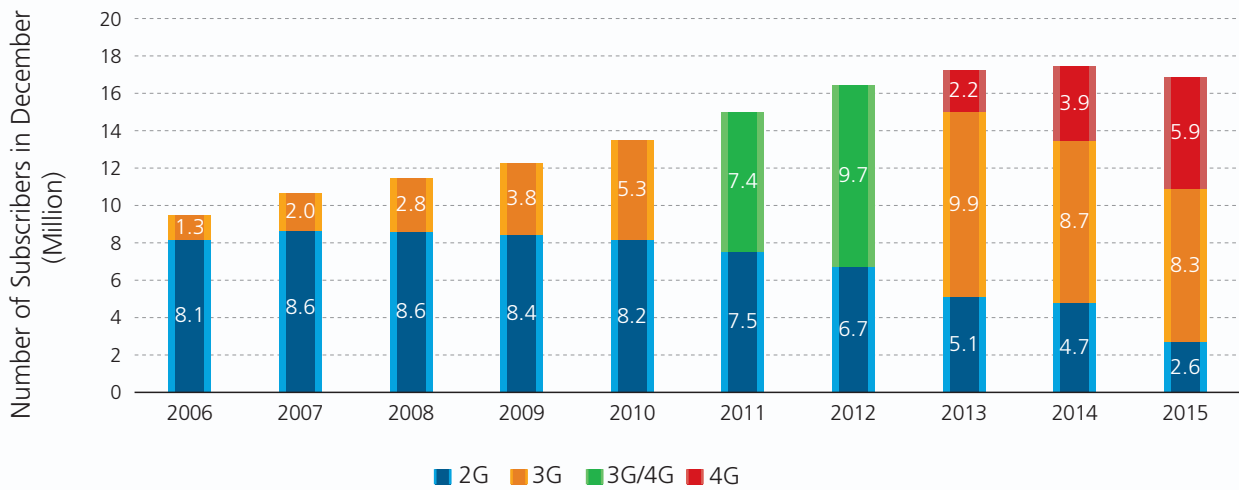


Figure 11: Mobile Customers using Postpaid and Prepaid SIM (2006 to 2015)

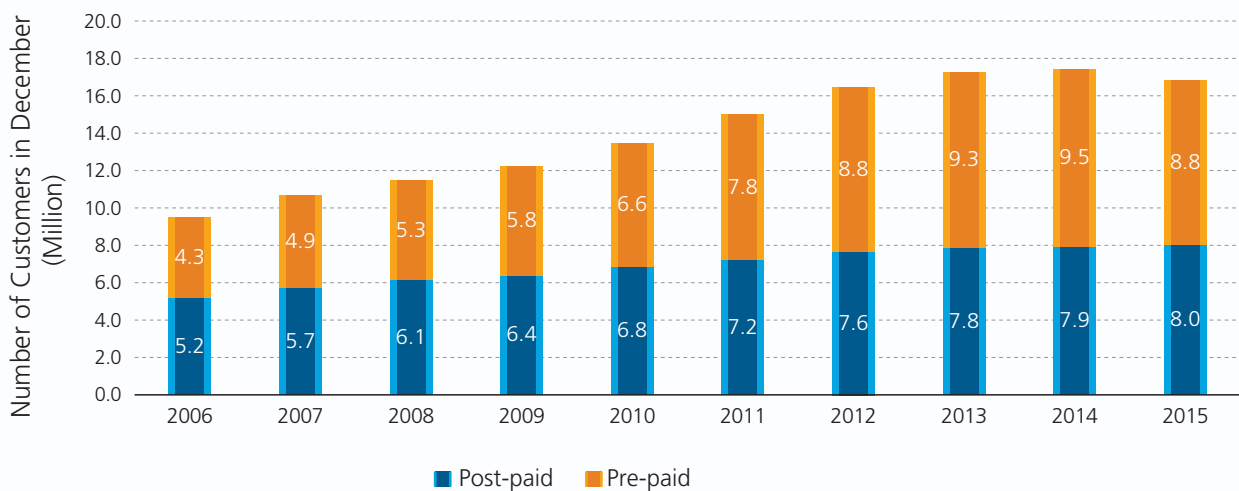
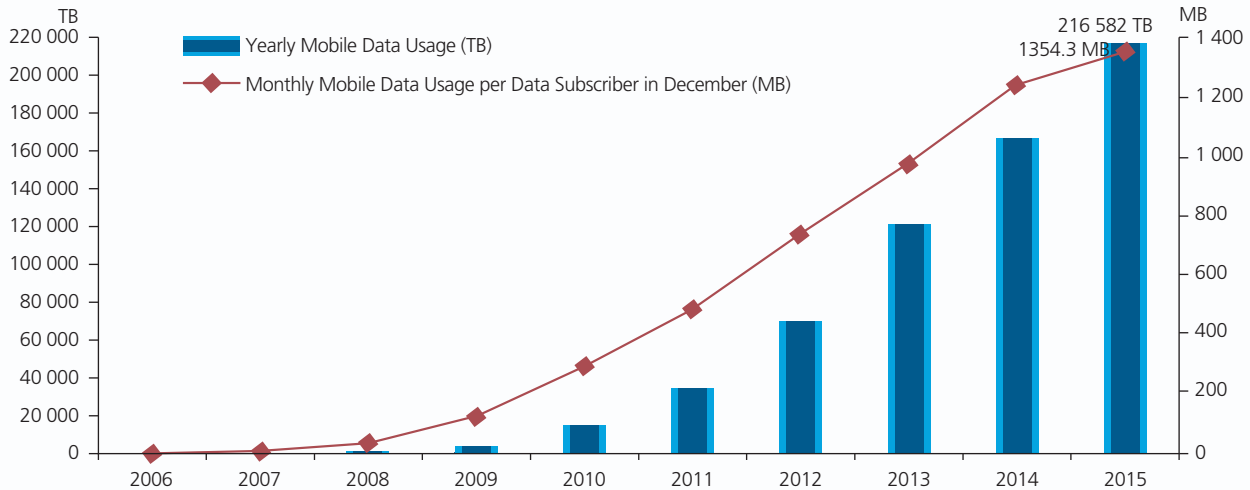


Figure 12: Mobile Data Usage (2006 to 2015)



Fixed Communications Services

The local fixed communications services market has been fully liberalised since 2003. There is no preset limit on the number of licences to be issued for fixed services, or any deadline for the submission of licence applications. Furthermore, there is no specific requirement on network rollout and investment and licensees may provide their services according to their proposals.

As of March 2016, there were 25 local fixed carriers, providing around 95 fixed lines per 100 households, one of the highest in the world. They are, in alphabetical order:

- 21 ViaNet Group Limited
- China Mobile Hong Kong Company Limited
- China Telecom Global Limited
- China Unicom (Hong Kong) Operations Limited
- ComNet Telecom (HK) Limited
- Equinix Hong Kong Limited
- HKC Network Limited
- Hong Kong Broadband Network Limited
- Hong Kong Cable Television Limited
- Hong Kong Telecommunications (HKT) Limited
- Hutchison Global Communications Limited
- New World Telecommunications 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
- TVB Network Vision Limited
- Verizon Hong Kong Limited
- Vodafone Enterprise Global Network HK Limited
- Wharf T&T Limited

As a result of the active network rollout by fixed carriers and the former Telecommunications Authority's initiative to encourage further network rollout by the withdrawal of mandatory Type II interconnection policy in mid-2008, 87.1% and 78.9% of households were able to enjoy a choice of at least two and three self-built customer access networks respectively as at March 2016. It is expected that the figures will keep growing as the carriers continue to roll out their networks.

Local fixed carriers are required to facilitate fixed number portability which enables consumers to switch to another fixed carrier without having to change their telephone numbers.

Fixed Broadband Services

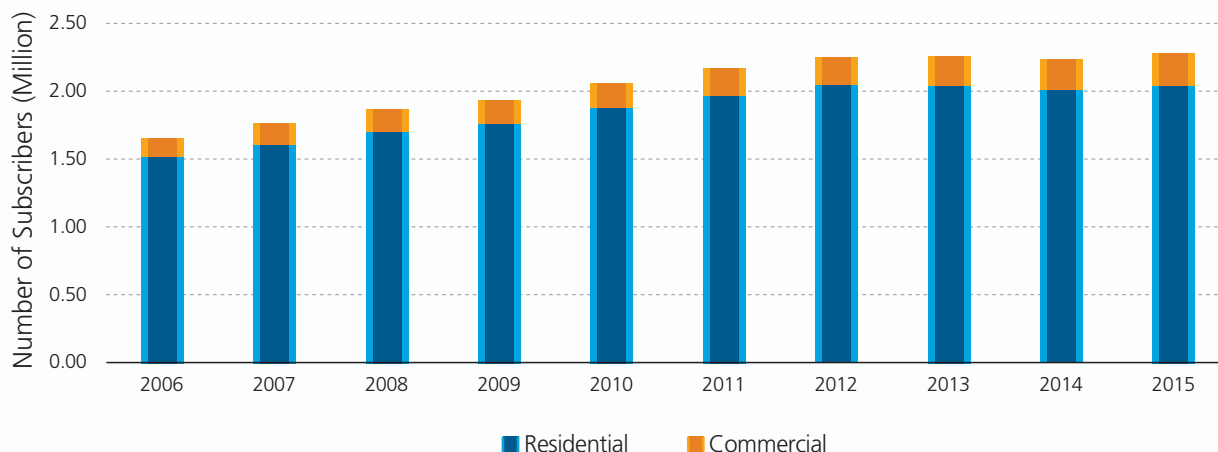
As at March 2016, 25 facility-based operators and 190 SBOs were authorised to provide broadband Internet access services in Hong Kong. With the continuous network rollout of facility-based

operators, the Hong Kong community is able to enjoy the 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 2016, there were around 2.3 million residential and commercial fixed broadband subscribers, with a household penetration rate of 84%. Broadband services are available at speeds up to 10 gigabit per second (Gbps). Around 86% of the broadband subscribers are using service plans with speeds at 10Mbps or above. The statistics of fixed broadband subscribers as at March 2016 and the statistics for the past 10 years are shown in [Figure 13](#) and [Figure 14](#) respectively.

Figure 13: Statistics of Fixed Broadband Subscribers as at March 2016

	No. of subscribers	% share
Total No. of broadband subscribers	2 347 833	
Broadband speed of 10Mbps or above	2 018 073	86.0%
Broadband speed below 10Mbps	329 760	14.0%
Residential	2 093 750	89.2%
Commercial	254 083	10.8%

Figure 14: Fixed Broadband Subscribers (2006 to 2015)



Next Generation Networks

Traditional telecommunications networks are built based on circuit-switched technologies and are primarily designed for the conveyance and provision of dedicated telecommunications services. With the advent of new technologies, it is now possible to build a single network for the conveyance and provision of a variety of services, including fixed voice telephony service, data service, mobile service and television service. Such new networks, commonly referred to as next generation networks (NGNs), serve as an open platform through which service providers are able to develop innovative services and applications, and establish direct relationship with their customers.

In Hong Kong, the development of NGNs has always been driven by technical and commercial considerations of carriers. The major network operators have already launched their NGNs. With the advent of NGN, the Authority will remain vigilant about the challenges to be brought about by NGN and ensure that the regulatory framework

remains updated and appropriate in the NGN era. After the completion of a consultancy study commissioned to examine the implication of NGN development on the regulatory framework in Hong Kong, the NGN working group set up under OFCA, with members coming from the industry as well as various professional associations, has been deliberating on various issues pertinent to NGN, including network security, emergency call services, standardisation and interoperability, interconnection regime and quality of services, universal service obligation, numbering, naming and addressing, numbering portability, interconnection charging and NGN development indicators.

Public Wi-Fi Services

Operators have been actively rolling out Wi-Fi networks. Six network operators and 53 class licensees are providing public Wi-Fi services. As at March 2016, there were 41 002 public Wi-Fi hotspots in the city and the number continued to grow. Free Wi-Fi services were available to the public in 603 government premises.

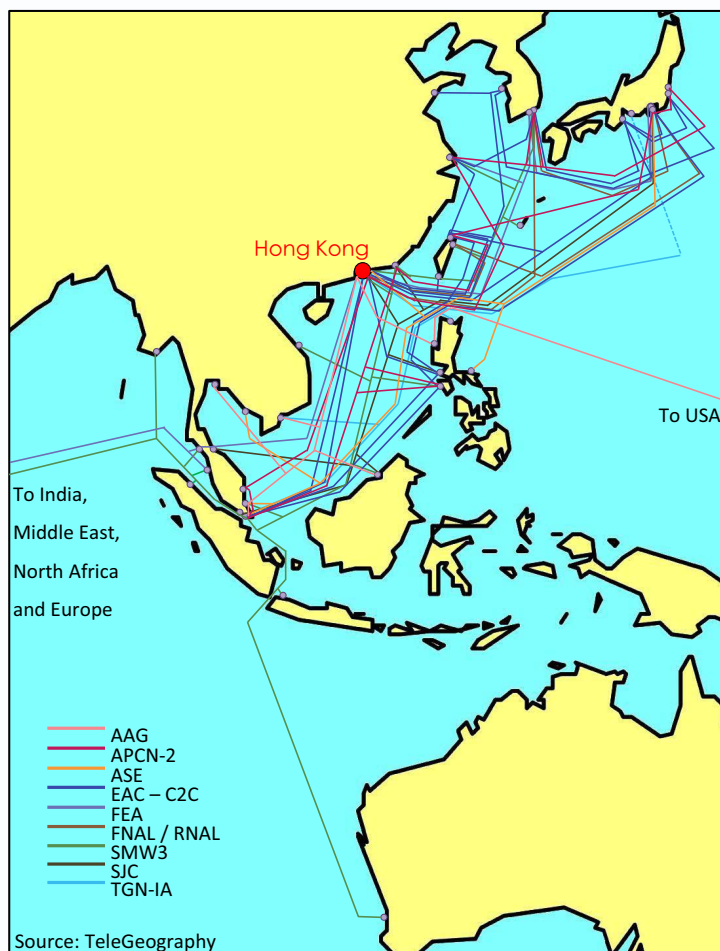
External Telecommunications Services

The external telecommunications facilities market has been fully liberalised since 2000. As of March 2016, 42 fixed carriers were authorised to provide cable-based and/or non-cable-based external telecommunications facilities.

As at March 2016, Hong Kong had a total of seven cable landing stations: two in Tong Fuk, two 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 2016, Hong Kong was connected to nine regional and trans-Pacific submarine cable systems. They are Asia-America Gateway Cable System (AAG), Asia Pacific Cable Network 2 (APCN-2), 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 2016, the total equipped external capacity exceeded 35 167 Gbps. Total external telephone traffic was 9.9 billion minutes for the period from 1 April 2015 to 31 March 2016. Landing of two additional submarine cable systems are in the pipeline and they are expected to be ready for service in late 2016 or mid 2017.

Figure 15: Submarine Cables between Hong Kong and Other Countries



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 200 satellite earth station antennas operated by a number of fixed carriers and broadcasters.

Licences are required for the operation of satellites and associated facilities. As at March 2016, two Hong Kong companies were licensed to operate and

provide satellite communication services, namely, Asia Satellite Telecommunications Company Limited (AsiaSat) and APT Satellite Company Limited (APT). AsiaSat and APT were established in 1988 and 1992 respectively.

The two companies have entered a new investment cycle of launching new satellites for replacement and provision of new business. A new satellite was launched in the second half of 2015, making a total of 10 satellites currently operated by AsiaSat and APT. Another new satellite is scheduled to be launched in the first half of 2017.

