

Section 8

The continuing evolution of television

- 8.1 The means by which television services are distributed and consumed have continued to evolve over the last year. Increasingly, broadcast and broadband delivery technologies are being brought together by more sophisticated consumer receiver equipment to provide consumers with a hybrid viewing experience. There has also been a continuation of the move towards higher resolution, more *life-like* TV formats, with UHD (Ultra High Definition) content now available on some broadcast and broadband delivery platforms.
- 8.2 In this section we set out three key themes:
- 8.2.1 **The live consumption of TV channels remains popular with viewers:** Viewing of live TV (i.e. broadcast TV content watched at the time of transmission) represents over 80% of viewing and is being complemented by an expanding range and capability of catch-up modes (digital video recorder and online).
- 8.2.2 **There has been a significant increase in both the number and sophistication of hybrid broadcast/broadband TV platforms:** Hybrid TV platforms are continuing to develop, including the launch of Freeview Play on the DTT platform. These platforms are seamlessly merging broadcast and online content into one consumer experience, where the viewer becomes 'abstracted' from the actual means of delivery.
- 8.2.3 **The majority of consumers can receive HD and the first Ultra-High Definition (UHD) services are now available:** 59% of households now access HD services and approximately 30% of TV sales support HD and UHD⁶³. UHD Blu-ray discs are available, and satellite and online distribution of UHD content has started. HD and UHD services require higher connection speeds, limiting their reach to households with higher speed broadband connections.

Consumers are able to view TV from a growing range of sources

- 8.3 Consumers in the UK receive digital television from a number of providers:
- 8.3.1 **Satellite:** TV services over satellite are available through platforms such as Sky's pay-TV service, or at no cost through Sky's UK viewing card, and through Freesat, which is available for a one-off digital receiver cost.
- 8.3.2 **Cable:** Virgin Media makes TV available over its cable network and passes 44% of UK homes. It has set a target to increase the coverage of its cable network by 4 Million homes and, once implemented, this is expected to increase cable TV coverage to around 65% of UK premises.

⁶³ Many of these models also support the new High Dynamic Range (HDR) standard, which gives TV pictures greater contrast and more vibrant colours.

8.3.3 **Digital Terrestrial Television:** A wide range of free-to-air channels is available via an aerial, accessible through Freeview and through hybrid boxes (Freeview Play, Now TV and YouView).

8.3.4 **IPTV:** A number of different providers, including BT, Now TV, TalkTalk and Plusnet deliver linear broadband TV services. Synapse TV and Connect TV offer a range of IPTV channels linked from slots on the Freeview electronic programme guide (EPG). Channel related catch-up content is also delivered online (supplementing DVR use) and on-demand non-catch-up content is available from a wide variety of providers including Netflix, Amazon Prime, and YouTube.

8.4 The coverage of the different: national, commercial, regional and local DTT multiplexes is shown in Figure 35 and Figure 36 below.

Figure 35: Coverage of DTT national, interim and local services

Multiplex	Standards	Bit rates (Mbit/s)	Coverage, premises
PSB1 (BBC A)	MPEG2 / DVB-T / 64QAM	24	99%
PSB2 (D3&4)	MPEG2 / DVB-T / 64QAM	24	99%
PSB3 (BBC B)	MPEG4 / DVB-T2 / 256QAM	40	99%
COM4 (SDN)	MPEG2 / DVB-T / 64QAM	27	~90%
COM5 (Arqiva A)	MPEG2 / DVB-T / 64QAM	27	~90%
COM6 (Arqiva B)	MPEG2 / DVB-T / 64QAM	27	~90%
COM7	MPEG4 / DVB-T2 / 256QAM	40	~76%
COM8	MPEG4 / DVB-T2 / 256QAM	40	~76%
LTMux	MPEG2 / DVB-T / QPSK	9	~54%*

Source:Ofcom

* Local coverage from 21 currently on air stations, of 34 granted licences

Figure 36: Coverage of DTT regional services

Multiplex	Standards	Bit rates (Mbit/s)	Regional coverage
NIMux	MPEG2 / DVB-T2 / QPSK	9.8	~71%†
GIMux (Manchester)	MPEG2 / DVB-T / 16QAM	18.1	~55%‡

Source:Ofcom

† Expressed as a percentage of households in Northern Ireland

‡ Expressed as a percentage of households in Greater Manchester

Figure 37: UK coverage of Digital satellite TV and Virgin Media cable broadband

Platform	Availability	Notes
Digital satellite TV	98%	Relates only to the ability to achieve a necessary line of sight path to the satellite and does not include other factors that can affect coverage including: access in multi-dwelling units where it is not feasible to install a dedicated household satellite dish and there is no internal wired distribution system for satellite, and the need for planning permission in some locations.
Virgin Media cable broadband	45%	Proportion of premises able to receive Virgin Media cable broadband services, June 2016

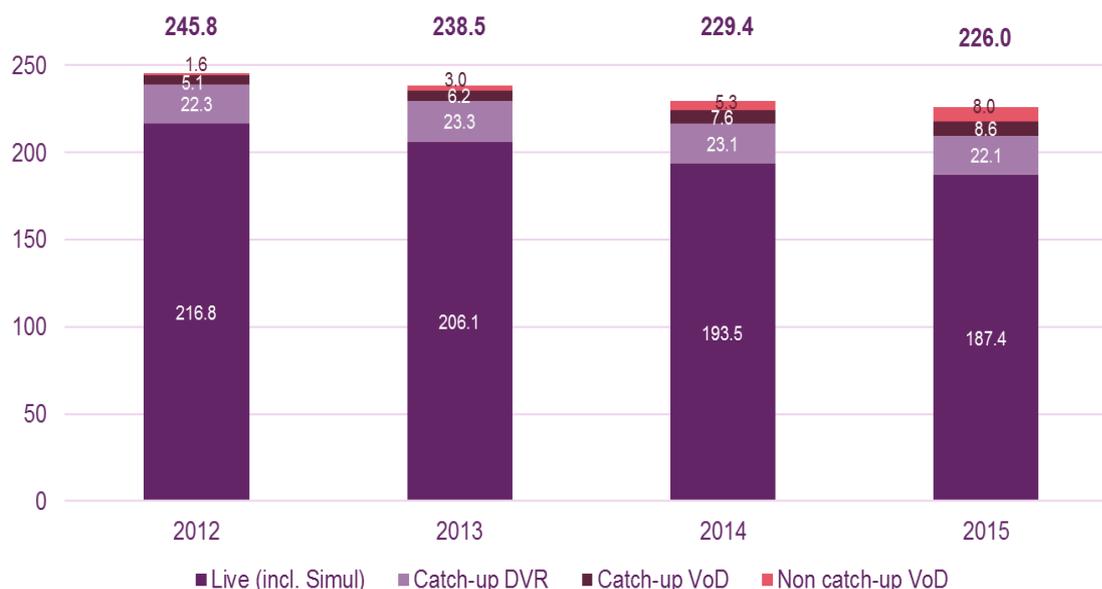
Sources: Ofcom and operators

The ways in which consumers watch TV are evolving

- 8.5 Live TV remains by far the most popular way of viewing TV, but continues to decline slowly each year.
- 8.6 However, there has been an increase in the use of TV channel related catch-up services, through both digital video recorders (DVRs) and online sources such as the BBC iPlayer and All 4.
- 8.7 Non catch-up video on demand (VoD) viewing continues to increase, albeit from a low base.
- 8.8 Overall, there has been a continuing decline in the amount of time spent watching long-form video content. The Digital Day 2016 survey⁶⁴ shows that this decline is commensurate with a rise in the use of a variety of alternative media services including social media, games and short form video content.

⁶⁴ The Digital Day findings are in section 1.4 from pages 15-29 of CMR 2016. https://www.ofcom.org.uk/_data/assets/pdf_file/0024/26826/cmr_uk_2016.pdf

Figure 38: Average daily viewing minutes across all devices for live TV, catch-up DVR, catch-up VoD and non-catch-up VoD.



Source: 3 Reasons estimates (including BARB data). Base: all devices, long-form professional audio-visual content. Live includes simulcast. Excludes physical consumption (e.g. DVDs) and short-form content. DVR data is based on a 7 day playback period.

The majority of consumers are able to receive HD services, and the first UHD services are now available

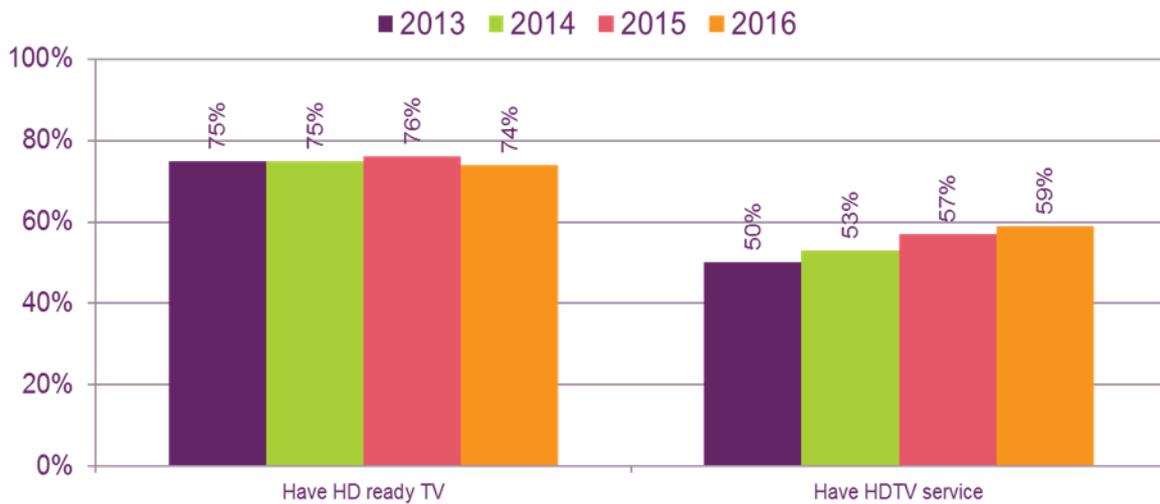
- 8.9 Sales of HD compatible sets represent over 99% of new set sales (Figure 39), and UHD compatible sets now represent 30% of new set sales. Sales of SD sets continue to decline and are now almost insignificant: a decision by Freeview that from 2017 only HD sets will be permitted to carry the Freeview brand logo is likely to mean that nearly all new DTT sets will be HD capable.
- 8.10 59% of all TV households are now accessing HD services (Figure 40). This figure is likely to grow further as more consumers replace existing SD sets with HD capable sets.

Figure 39: Sales volume share of receivers, by technology (000's)



Source GfK: sales volumes of SD, HD Ready, Full HD and UHD receivers

Figure 40: Take-up of HDTV sets and HD services, smart TVs and DVRs.



Source: Ofcom Technology Tracker, data as at Q1 2013-2014, then H1 2015-2016.
 Base: All adults aged 16+ with a TV in the household: 2013 (3661), 2014 (3635), 2015 (3616), 2016 (3606)

- 8.11 Overall, viewing of the HD versions of the main five PSB channels continues to grow slowly (see Figure 41) and now accounts for 17% of viewing. There is a notable disparity between the amount of HD viewing of some PSB channels. For example, the HD viewing of BBC One is at 11% and BBC Two at 33%.
- 8.12 For a number of potential reasons the viewing of PSB channels in SD remains strong, including: the higher position of SD services in the electronic programme guide (EPG), relatively small differences between the perceived quality of SD and HD

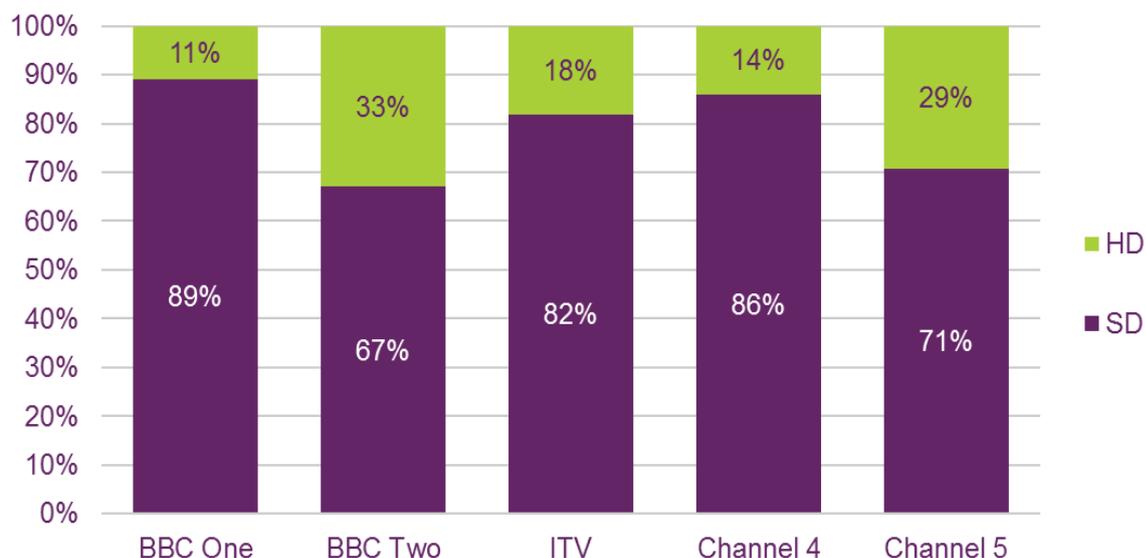
services, and a lack of regional opt-outs in some HD services. Figure 42 shows the average proportion of viewing of SD and HD for the main five PSBs individually.

Figure 41: Average contribution of viewing of SD and HD for the main five PSBs combined, by half year January 2014 – September 2016



Source: BARB. Individuals 4+ with HD available in the home. Average proportion of viewing of the HD channels for BBC One, BBC Two, ITV, Channel 4 and Channel 5 combined.

Figure 42: Average contribution of viewing of SD and HD January – September 2016



Source: BARB. Individuals 4+ with HD available in the home. Not all available HD channel services are separately reported and so we have used the main five PSBs for our analysis (their combined share of total broadcast TV viewing in 2015 was 51%)

8.13 The last year has seen a significant increase in the number of UHD (4K) capable devices and sales of UHD TVs have now reached 30% by volume of the market. UHD content is available on UHD Blu-ray disc; via Satellite from Sky (through Sky Q's silver's red-button - covering 124 games in the 2016/17 Premier League); and online through BT's Ultra HD YouView box and Amazon's Fire TV. The latest DTG (Digital Television Group) D-Book specification, released in November 2016, provides for online UHD content.

8.14 There have been, as yet, no announcements of UHD services on DTT.

A number of trends are driving up IPTV viewing

8.15 As we set out in Section 4, the amount of data use on fixed networks has grown by 36% over the past year, driven in large part by video. A number of distinct trends suggests that video traffic will continue to grow over fixed networks:

8.15.1 **Increased take-up of broadband services:** The majority of households have a TV or set top box connected to the internet. Research conducted by media consultancy 3 Reasons at the end of 2015 shows that around 62% of UK TV homes had a TV connected to the internet via a set top box or a smart TV. This figure increases further if devices such as games consoles and dongles are included.

8.15.2 **Growth in hybrid TV services:** The growing range of hybrid broadcast/broadband services and devices is likely to further increase the consumption of broadband TV services. In addition, the improving ease of use of these services supported by better user interfaces and a more seamless integration of broadcast and online content are making it easier and more beneficial for viewers to access on-demand connected TV services.

8.15.3 **Growth in online catch-up TV viewing.** Catch-up TV is a significant and growing mode of viewing - fuelled by DVRs, connected boxes and smart TVs. And, as more catch-up viewing is carried out online, the demands for internet bandwidth and capacity are likely to grow further.

8.15.4 **Growth in other online TV services.** The use of non-catch-up video on demand services also continues to grow. For example, the proportion of adults watching short online video clips (e.g. YouTube and Vimeo) per week has risen from 20% in 2014 to 25% in 2016⁶⁵.

8.15.5 **The use of subscriber video on demand (SVOD) is also growing.** For example, more households are subscribing to discretionary video-on-demand services such as Netflix, Now TV and Amazon Prime⁶⁶. However, subscription video-on-demand services are, on the whole, complementing rather than replacing conventional TV⁶⁷.

8.15.6 **Finally, there is a growing take up of linear IPTV services.** Linear internet TV (IPTV) services, such as BT TV and Now TV, are continuing to add customers, competing with existing pay-TV platforms such as Sky and Virgin Media, particularly at the low-cost end of the market.

8.16 As consumers move onto faster 4G and 5G mobile services it is expected that video viewing on mobile phones will continue to increase, but it is an open question as to

⁶⁵ See page 16 of the UK Communications Market Report 2016

https://www.ofcom.org.uk/data/assets/pdf_file/0024/26826/cmr_uk_2016.pdf

⁶⁶ 27% of all UK households had a subscription service to at least one of Netflix, Amazon Prime or Now TV in Q3 2016 according to the BARB Establishment Survey.

⁶⁷ See pages 64-65 of the UK Communications Market Report 2016

https://www.ofcom.org.uk/data/assets/pdf_file/0024/26826/cmr_uk_2016.pdf

whether the majority of this viewing in the future will be of live TV services or on-demand content.

Implications of changing viewer behaviour for broadband infrastructure

- 8.17 As discussed in Section 4, the vast majority (99%) of broadband connections are, in principle, now capable of delivering IPTV in standard definition, since they have a speed of above 2Mbit/s.
- 8.18 Currently, a broadband connection speed of at least 2Mbit/s is needed to deliver an SD video stream, from 6 to 8Mbit/s for an HD stream, and from 20 to 25Mbit/s for a UHD stream. In practice higher headline broadband speeds than these may be needed to achieve a good consumer experience. This might be because other services might be being accessed at the same time over the broadband connection, or the headline connection speed is not available all of the time due to congestion in the internet delivery chain.
- 8.19 The new and more efficient HEVC (High Efficiency Video Coding) compression standard is helping to reduce the connection speeds needed to deliver video. This standard is being used to deliver the new UHD services available from Amazon Prime, BT, Netflix and YouTube. Despite the use of this more efficient compression standard, BT currently recommends that a connection speed of at least 44Mbit/s is needed to access its UHD sports services.
- 8.20 If HEVC is more widely utilised for IPTV, it could also reduce the connection speeds required to deliver SD and HD services.

Implications of changing viewer behaviour for broadcast infrastructure

- 8.21 Viewers are starting to embrace higher resolution, more life-like TV services, and the use of internet connectivity to access a wider range of content at times that are more convenient to them. To meet these expectations, TV platforms need to continue to evolve; including:
- 8.21.1 Enhancing their hybrid DTT/broadband TV offer; and
 - 8.21.2 Upgrading broadcast transmission and transmission standards.
- 8.22 Some of the improvements are already underway. For example, the Freeview Play service offers consumers easier-to-use IPTV services. Freeview has also announced that the Freeview label will be available only for HD (and UHD) products as of 2017, and the latest D-Book specification will support UHD IPTV services. Sky has similarly launched its Now TV platform which integrates DTT and IPTV services, and its Sky Q platform which integrates satellite and IPTV services, and which supports UHD.
- 8.23 An improved selection of HD channels on DTT made possible in part by two interim DTT multiplexes which have widened the range of HD services on the platform. HD services use more efficient compression and transmission technology (MPEG4 and DVB-T2) which provide more channel capacity and which can, therefore, effectively expand DTT capacity for other services in the future.