



**Report for the
Broadcasting Commission of Ireland
Overview Study into the
Experiences and Practices of DTT in the UK**

Final version v 1.0

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This document is prepared solely for the use and benefit of the Broadcasting Commission of Ireland. Neither the author nor GOS Consulting accepts or assumes any responsibility or duty of care to any third party.

1 Foreward and Acknowledgements

Under the provisions of the Broadcasting (Amendment) Act 2007, the Broadcasting Commission of Ireland (BCI) is responsible for arranging for the establishment, maintenance and operation of three national television multiplexes (multiplexes) conveying Digital Terrestrial Television (DTT) across Ireland.

The BCI wishes to develop its knowledge and understanding of the various considerations in respect of the development and roll-out of commercial DTT in Ireland. An essential part of this, sitting alongside broader consultation and policy development work, is an examination of other jurisdictions. To this end, the BCI viewed the UK experience as important and commissioned GOS Consulting Limited to compile this report providing an overview of experiences and practices in the UK.

Monetary amounts have been expressed throughout the report in equivalent Euros at current exchange rates (£1:€1.45).

We wish to express our gratitude to the following people for their cooperation and advice in compiling this report:

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2 Introduction and Policy Objectives

This chapter provides an overview of Digital Terrestrial Television (DTT) in the UK and how it has evolved and discusses the government's objectives for DTT. For ease of reference, a summary of all the key players with regard to DTT in the UK is provided in Annex 1.

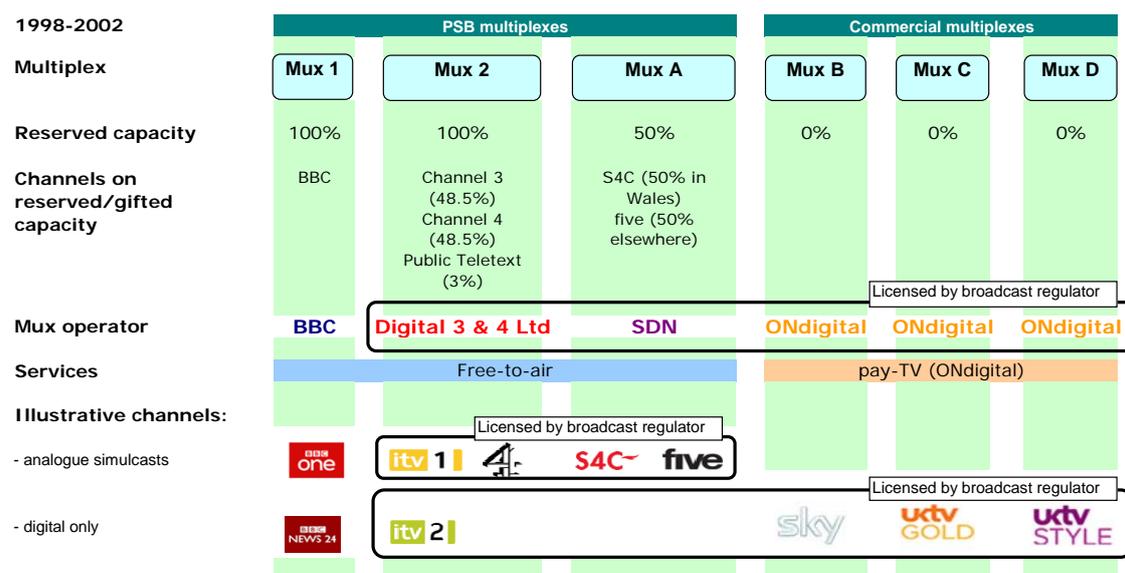
2.1 DTT Overview

2.1.1 Number of Multiplexes and Operators

Six multiplexes, each capable of carrying several programme channels and/or data, have been established in the UK. One of them was reserved for the BBC, two were gifted to the other providers of Public Service Broadcasting (Channels 3, 4 and 5, S4C and Public Teletext) and the remaining three multiplexes were made available for other commercial services. The PSB services in the UK include several channels from the BBC (some of which are only available on digital platforms), three nationwide commercially-funded channels from Channels 3, 4 and 5 (although Channel 5's coverage is less than that of the other two), a Welsh-language channel from S4C, which is part commercially-funded, and the Public Teletext service.

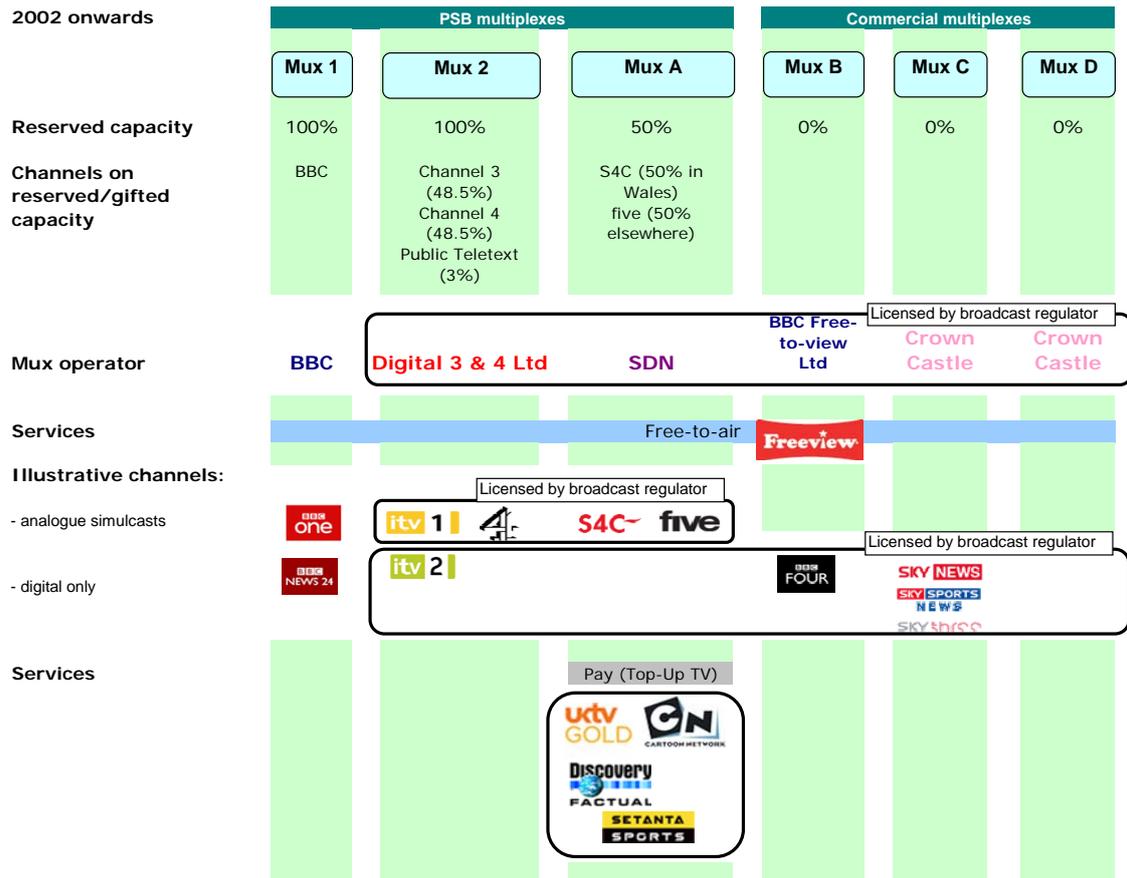
The three PSB multiplexes (referred to as Mux 1, 2 and A) carry a range of free-to-air (FTA) programme services, which included simulcast versions of the analogue terrestrial transmissions from the PSB broadcasters. The commercial multiplexes (Mux B, C and D) were originally awarded through a competitive process to ONdigital, which used them to provide a pay-TV service. The diagram below illustrates how programme channels were distributed across the six multiplexes. Further details of the programme services available are given in the next chapter.

Figure 1 Summary of DTT multiplex allocations in the UK (1998 - 2002)



In 2002, the situation changed significantly when ITV digital (re-branded from ONdigital in the previous year) was placed in administration and the three commercial multiplexes were re-assigned, after another competitive process, to a BBC subsidiary (BBC Free-to-view Limited) and Crown Castle. Since that time, all six multiplexes have been used to provide a FTA service that is marketed under the brand name Freeview. A smaller pay-TV service called Top-Up TV has since been launched, independently of the Freeview brand. The new arrangement is summarised graphically in the diagram below.

Figure 2 Summary of DTT multiplex allocations in the UK (2002 onwards)



In late 2004, the UK’s broadcasting regulator, Ofcom, confirmed that there would be sufficient interleaved capacity within the retained spectrum for a seventh multiplex after digital switch-over (DSO), when current analogue terrestrial transmissions would be switched off; however, it did not intend to make the spectrum available for that purpose. The main reason for this decision is that coverage of such a multiplex would be significantly below that of the existing multiplexes, reaching an estimated 75 per cent of UK homes at most after switchover (i.e. up to 15 per cent lower than that expected to be achieved by Mux D).

Mux 1, operated by the BBC, and the services carried on that multiplex are subject to the provisions in the BBC’s Charter and Agreement with the Secretary of State. The other multiplexes are regulated by Ofcom (and, before it, the Independent Television Commission). Under the two-tier arrangement introduced by the 1996 Act, there are two main types of DTT licence:

- Multiplex licences - these are for a fixed duration of 12 years, and cover the combining and broadcasting of programme and other services on a single carrier frequency; and
- Digital Programme Service (DPS) and Digital Additional Service (DAS) licences - these endure until surrendered or revoked and cover the provision of one or more television programme channels or additional services respectively¹.

Multiplex operators are expected to make full use of the capacity available and are jointly responsible, with the channel providers, for ensuring that services comply with regulatory requirements.

DPS (since re-named Digital Television Programme Service or DTPS) and DAS (since re-named Digital Television Additional Service, or DTAS) licences are available on request from Ofcom, subject to certain basic conditions being met. Holders of DTPS licences are responsible for ensuring that their programmes comply with Ofcom’s content requirements (see Chapter 4 for further details). DTAS licensees are subject to consumer protection content regulation and, depending on the nature of the service, may also have to comply with one or more specific service codes.

¹ Similarly, radio services on DTT are subject to Digital Sound Programme or DSP licences.

The digital simulcast PSB channels provided by Channels 3, 4 and 5, Public Teletext and S4C were initially licensed under their existing (analogue) licences, rather than separate DTSP licences. In December 2004, Ofcom issued the broadcasters with Digital Replacement Licences (DRLs), which replace their previous licences and continue to cover both analogue and digital transmissions.

The various types of DTT licence (i.e. multiplex, DTSP, DTAS and DSP) were amended in late 2006 as part of the preparations for digital switchover, under provisions allowed by an amendment to the 1996 Act. These changes are discussed in Chapter 4 below and, in Chapter 5, the provisions for implementing switchover are discussed in detail.

2.1.2 Transmission Standards and Coverage

All multiplex operators chose to limit DTT transmissions when launching their services to the 80 main and relay sites around the UK that constituted the minimum requirement stipulated by government. This provided core coverage by all six multiplexes of 56 percent of households in the UK (the figure was slightly higher for the three PSB multiplexes). These figures were lower than expected from pre-launch planning work. Moreover, the coverage of individual multiplexes varied from 81 percent (for Mux 1) to 64 percent of households (for Mux D).

In the absence of any large-scale experience of DTT elsewhere in the world, the planning for DTT in the UK was underpinned by a series of working assumptions. In hindsight, some of these assumptions were unnecessarily cautious. Not only did the poorer-than-expected coverage present difficulties in terms of marketing DTT services but the disparity across the multiplexes, whereby some programme channels were available in a particular area while others were not, resulted in considerable confusion among consumers.

Once DTT went live and the transmission characteristics observed, work began on making improvements. The first initiative was an equalisation programme to provide more consistent coverage across the multiplexes by selectively increasing the transmission power of weaker multiplex signals. Further changes, which were introduced when the three commercial multiplex licences changed hands in 2002, were a doubling in transmission power and a change in the transmission mode on some of the multiplexes (which effectively increased the coverage yet further, but at the cost of reducing the number of channels). Collectively, these increased the core coverage to 73 percent.

Further changes are planned for when DSO occurs. The PSB channels currently carried on Mux A will be transferred to Mux B and all 1,154 transmitter sites in the UK will be upgraded to broadcast the three (re-designated) PSB multiplexes, as illustrated graphically below.

Figure 3 Summary of changes in transmission arrangements

	PSB multiplexes			Commercial multiplexes		
	Mux 1	Mux 2	Mux A	Mux B	Mux C	Mux D
1998	Overlay network at 50 main transmitters and 30 relays providing core coverage of 56% with subsequent equalisation programme improving core coverage to 68%*					
Transmitter network operator	Crown Castle	NTL	NTL	Crown Castle	Crown Castle	Crown Castle
Modulation	64QAM	64QAM	64QAM	64QAM	64QAM	64QAM
2002	Overlay network at 50 main transmitters and 30 relays +3dB power output providing core coverage of 73%					
Modulation	16QAM	64QAM	64QAM	16QAM	16QAM	16QAM
2012 (DSO)	Mux 1	Mux 2	Mux B	Mux A	Mux C	Mux D
	Convert all 1,154 transmitters to provide core coverage of 98.5%*			Increase power at 80 sites to provide core coverage of approx 90%*		

* Households covered (subject to having suitable aerial installation)

This build-out, together with further changes in transmission, should ensure that PSB coverage will reach 98.5 percent of households in the UK, equivalent to the coverage currently achieved by analogue transmissions, by the time DSO is scheduled to be completed in 2012².

2.2 Chronology

The development of DTT in the UK can be viewed in two phases: the first spans the period up until the shift in 2002 from a predominantly pay-TV based proposition to one driven by FTA, and a second phase from then on where the focus has been very much on preparing for DSO. These phases are summarised in figures 4 and 5.

DTT in the UK essentially began with the publication of a government White Paper in 1995, which was quickly translated into a regulatory framework for DTT by the 1996 Broadcasting Act. Licences for the three commercial multiplexes were advertised by the then broadcasting regulator, the ITC. After a competitive evaluation process, the licences were awarded to a consortium formed by the largest two Channel 3 licence holder groups, Carlton and Granada, under the banner of British Digital Broadcasting (BDB). BDB launched its services in 1998 under the name of ONdigital.

Despite further attempts by a newly-merged ITV group consisting of Carlton and Granada to re-invigorate ONdigital's service, the multiplex operator (re-named ITV Digital) was placed in administration and the three commercial multiplex licences handed back in early 2002 to the ITC. A new competition was rapidly organised to re-assign the three licences and, in October that year, the BBC and Crown Consortium launched the Freeview service.

In 1999, the government made its first formal announcement regarding DSO and the criteria that would have to be fulfilled before analogue transmission services would be switched-off, but no firm commitment was given to when this would occur. However, it marks the beginning of the preparations for DSO and was followed up by a White Paper in 2001.

In the second phase (figure 5) much of the activity has focused on working towards DSO on a number of fronts; the main ones being technical planning, organisational issues and consumer concerns. These are considered in detail in Chapter 5.

A more detailed chronology appears in Annex 2.

² Analogue core coverage of 98.5 percent of homes includes approximately three percent where reception is marginal (i.e. signal is sub-standard or outside of predicted coverage but still receive reasonable signal)

Figure 4 Summary chronology for DTT in the UK (1995 - 2001)

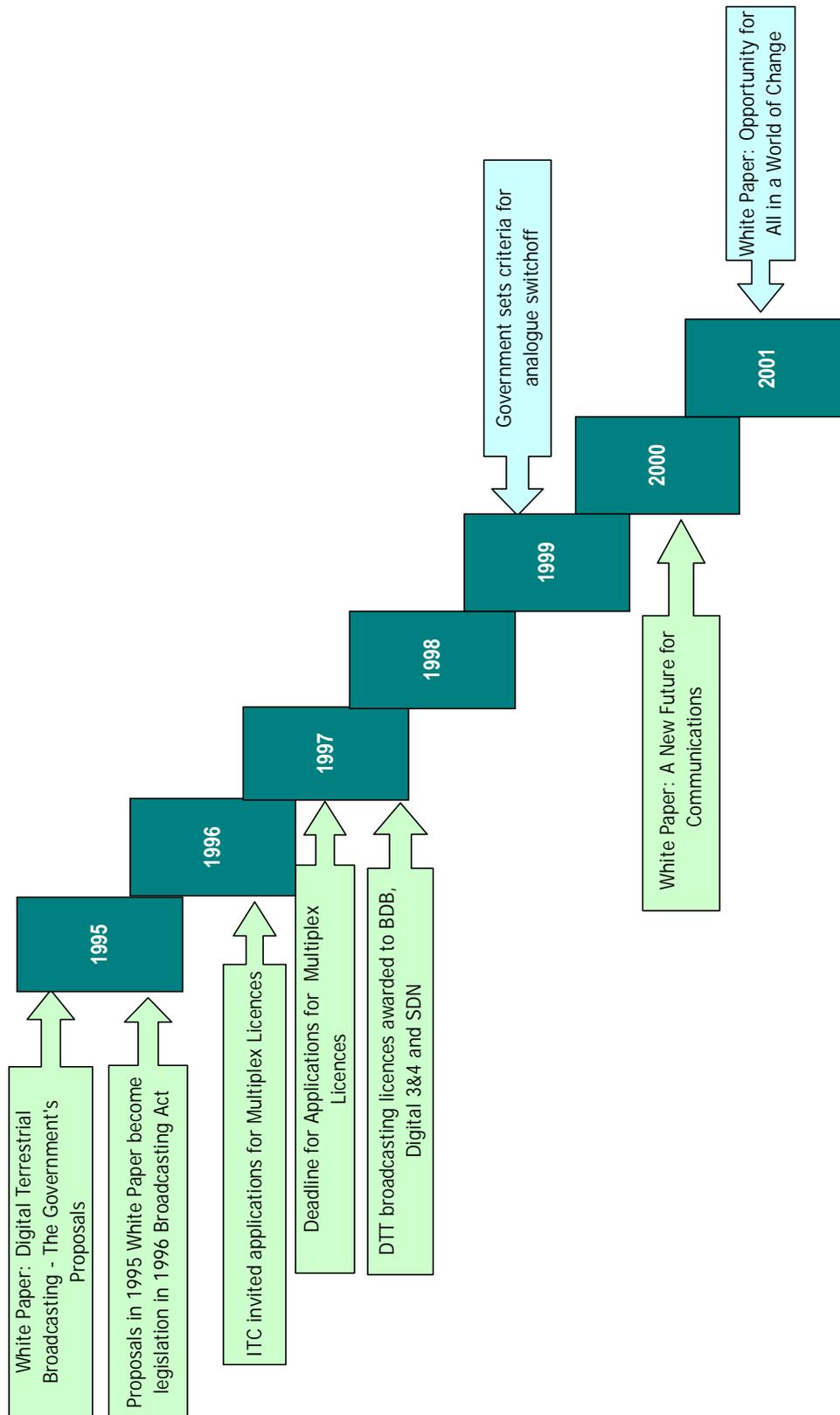
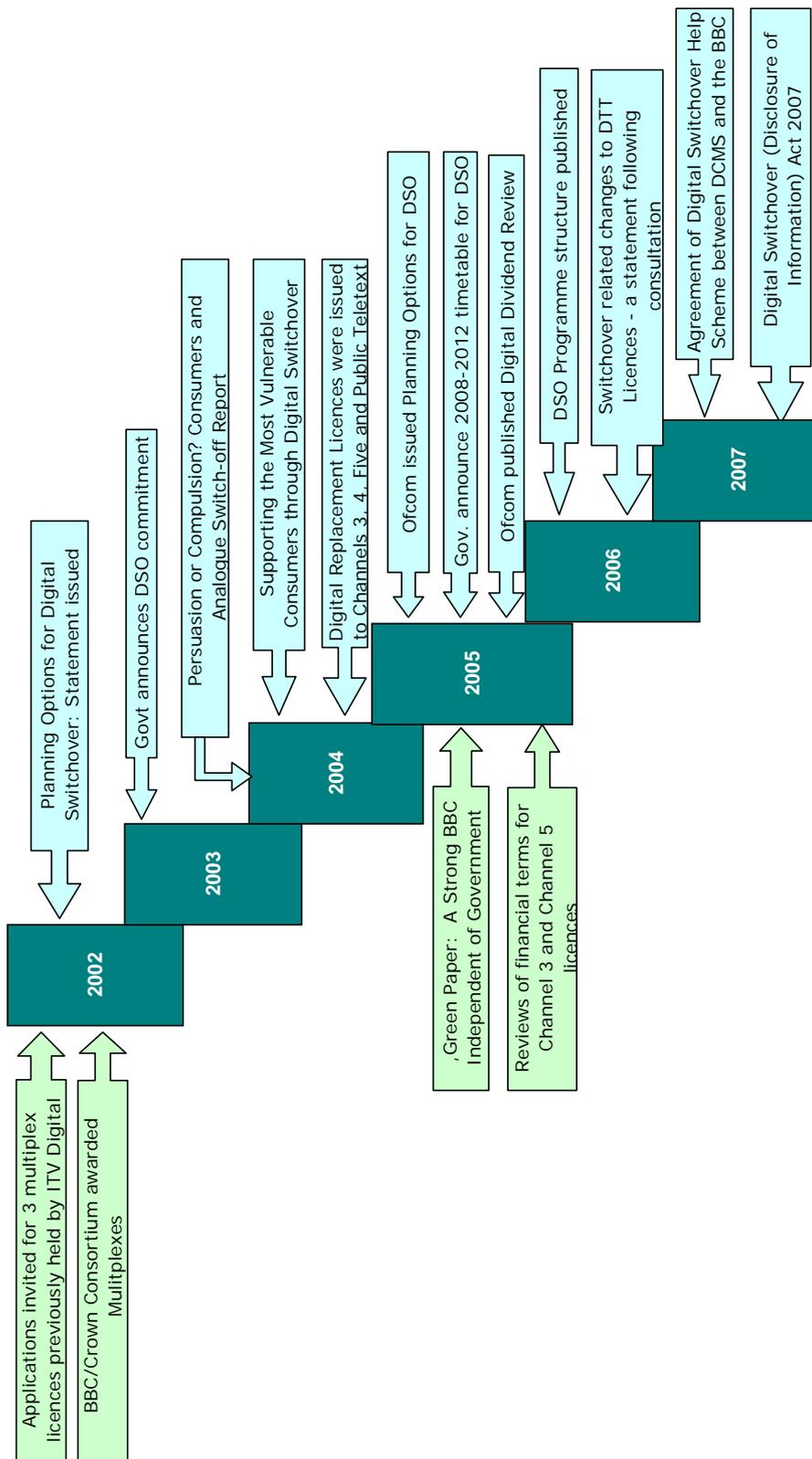


Figure 5 Summary chronology for DTT in the UK (2002 onwards)



2.3 Policy Objectives

The framework for DTT in the UK was set out in a government White Paper³ in 1995. It identified the following policy objectives, or justifications, for DTT:

- **Extend viewer choice**
Extending viewer choice was something of a relative notion since it was only meaningful for viewers that previously relied on analogue television. Due to DTT's technical limitations, it was not in a position to match the channel capacity associated with satellite or cable.
- **Provide benefits for UK industry**
Providing benefits to UK industry has been a familiar, but often intangible, goal for government technology policy.
- **Extend take-up of interactive services**
Technically, cable was the ideal platform for providing interactive services, but at the time of the White Paper such services were virtually non-existent. There was a long-standing aim to develop "information superhighways" and DTT offered another opportunity to promote interactivity (although, of course, any two-way communication based around DTT would require, like satellite, a telephone line for the return path). Emailing, access to the web and games were featured by ONdigital on the DTT platform but they do not appear to have been popular with consumers and now interactivity on DTT is primarily associated with the TV remote control "red button", which provides supplementary programme information, and with phone-in services (on games and shopping channels).
- **Make more efficient use of spectrum through switching off analogue transmissions**
More efficient spectrum usage can only be realised once terrestrial analogue television was switched off. No commitment was made at the outset regarding timescales for switch-off and so this was a much longer term goal than the other objectives.
- **Provide competition to existing multi-channel platforms**
The prospect for increased platform competition was not stated quite so overtly in the White Paper but it did make mention of DTT's potential to provide terrestrial broadcasters the opportunity to compete with those on satellite and cable.

These objectives were translated into the Broadcasting Act 1996, which authorised the Independent Television Commission (ITC) to licence five of the six multiplexes (the sixth was reserved for the BBC, which was not regulated by the ITC). Further details of the legislative background and licensing arrangements are provided in Chapter 4.

As described in subsequent chapters, DTT may be regarded as a success in so far as it has:

- Improved viewer choice for a significant proportion of homes that probably would not otherwise have adopted multi-channel television; and
- Provided consumers with an alternative multi-channel platform to pay-TV.

However, it has to be noted that these benefits are closely linked to the success of the FTA service from Freeview and this was preceded by the failure of ONdigital/ITV Digital. It is less clear that DTT has been able to offer a viable pay-TV service to compete with other platforms.

With regard to benefits for UK industry, this has received little attention. Undoubtedly, it has stimulated the equipment market through the demand for set top boxes (STBs) and personal video recorders (PVRs), with benefits for UK retailers, but it is less clear whether it has had any material effect at a more strategic level for UK industry. In a less tangible way, one could argue that it has established the UK as a knowledge centre for DTT planning and digital switchover (DSO).

The benefits of releasing spectrum have, of course, yet to be realised; although it has become more prominent in policy statements as DSO draws near. Indeed, some interviewees consider it to be the essential driving force behind DSO. Ofcom recently carried out a Digital Dividend Review⁴, identifying just over 100 MHz of spectrum that would be released for other

³ Digital Terrestrial Broadcasting: The Government's Proposals (DNH, 1995)

⁴ *Digital Dividend Review – Consultation*, Ofcom, December 2006
<http://www.ofcom.org.uk/consult/condocs/ddr/ddrmain.pdf>

purposes after DSO. The value to consumers of this released spectrum was estimated to be in the region of £5-10 billion (€7-14 billion).

Of the five objectives set out by government in 1995, the one that has been most difficult to realise has been extending the take-up of interactive services. As explained in Chapter 4 when considering the licensing process, interactive services were featured quite strongly by one of the two applicants for multiplex licences in 1997/98 but it was unsuccessful in its application and, more generally, consumer research tends to show that interactive services are not particularly sought after by television viewers.

3 Economic Model

This section begins by looking at the impact that DTT has had on viewer choice and how the take-up of DTT has affected other distribution platforms. It then goes on to consider the investment propositions of the various DTT offerings and some of the other financial issues that have arisen.

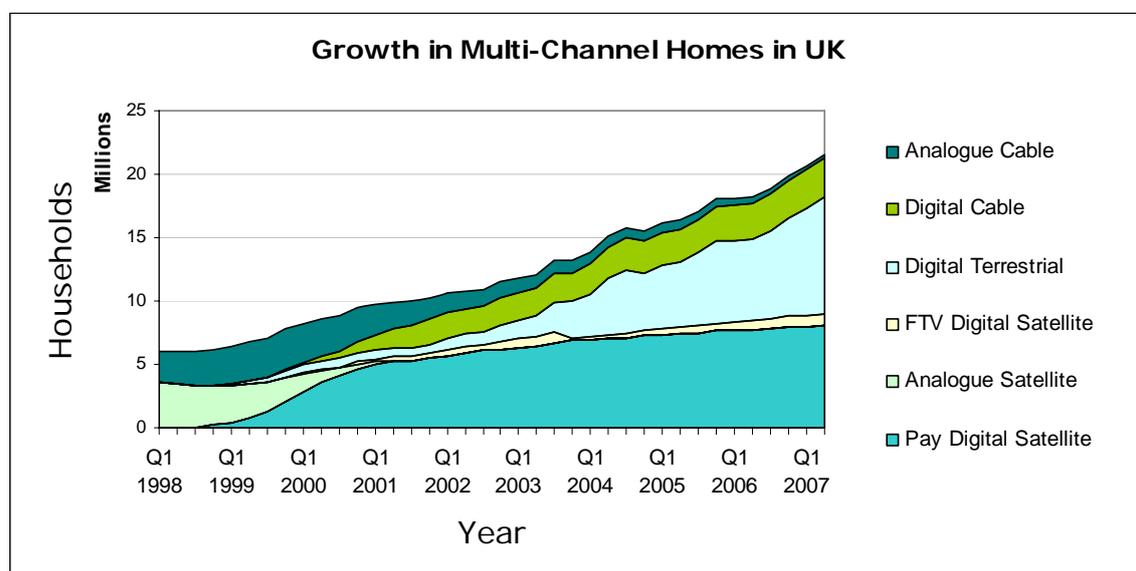
3.1 Structure of TV Market

By June 2007, DTT was the most commonly used platform for watching multi-channel television on the main TV set, having been adopted by 9.1 million homes (equivalent to nearly 36 percent of TV households in the UK). A similar number of secondary TVs (in bedrooms, kitchens etc) have also been converted to DTT so that, of the 60 million TV sets in the UK, 30 percent of them are now DTT-capable (a further 46 percent of TVs remain analogue-only, the majority of them being used as secondary sets).

The UK was the first country to introduce DTT and has one of the highest, if not the highest, penetration levels in the world. But its development over the last nine years or so has not been without problems; the original licence holder for the three wholly-commercial multiplexes went into administration after four years of trading, resulting in the licences being re-advertised and a new service, based on a very different business model, being launched. The available channel line-up has also evolved through various permutations and there is continuing debate about whether and how transmission standards should change.

When DTT was first launched in November 1998, around 6 million homes (equivalent to 25 percent of TV households) were already receiving a multi-channel service from BSkyB or one of the cable companies (see figure below). The cable companies had been first into the market but their coverage was patchy, they lacked a compelling programme package and, as a result, experienced slow take-up. The situation changed when Sky entered the market with its UK-directed Direct-to-Home (DTH) satellite service in March 1989. This was followed shortly afterwards by a second satellite service provider, BSB. Within 18 months, Sky had merged with or, effectively, taken over BSB to become BSkyB and within ten years supplied over 50 percent of the multi-channel pay-TV market. It now has over two thirds of the pay-TV (subscription) market, in terms of households.

Figure 6 Growth in multi-channel homes in UK



Extracted from Ofcom's quarterly digital television (DTV) progress report⁵

Six weeks before BDB launched its DTT service (which was branded ONdigital and subsequently became ITV Digital), and no doubt spurred by its arrival, BSkyB introduced its digital satellite service on 1 October 1998. It completed the transition from analogue to digital,

⁵ *The Communications Market: Digital Progress Report – Q2 2007*, Ofcom, Sept 2007
http://www.ofcom.org.uk/research/tv/reports/dtv/dtv_2007_q2/dtvq207.pdf

with no substantial loss in subscribers, in less than three years. Cable has been much slower making the transition and, by June 2007, around 8 percent of cable homes still receive an analogue service.

There is also a small but significant number of homes that receive free-to-view satellite services. Growth in the population has occurred in two waves. Initially, this consisted of ex-Sky customers who continued to use their set-top boxes to receive digital TV (along with their Sky smartcards) and people who, although never Sky customers, had purchased a satellite dish and set-top box (and used a "Solus" card provided by the BBC). However, in 2003, BSkyB replaced all of its viewing cards and the BBC decided to broadcast its channels in unencrypted form and stopped supplying the Solus cards. The combined effect of these events was that free-to-air satellite viewers saw their choice limited to the BBC channels; other public service channels remained encrypted and hence inaccessible. A replacement free-to-view smartcard scheme was initially funded by ITV, Channel 4 and Five, but this scheme closed not long after. Ofcom no longer considers such homes to be digital households, which accounts for the sharp fall, in Figure 6, in the number of FTA satellite households in 2003/04.

The second wave of growth in free-to-view satellite homes began in late 2004 when BSkyB launched a subscription-free satellite service, Free-Sat, providing around 150 channels including the PSB services. An FTA satellite service provides a useful supplement to DTT, which is technically not capable of matching the existing analogue terrestrial coverage until switch-off occurs and, even then, will not serve the whole of the UK. However, being a commercial venture, there was no guarantee that BSkyB's service would remain free-of-charge to viewers and the BBC has decided to launch its own free-to-air satellite service in the coming months.

BSkyB's Free-sat service is currently received in an estimated 600,000 homes. Initial forecasts from the BBC suggest that its own PSB free-to-air satellite service will be adopted by around 4 per cent of homes by 2012 (approximately 1 million homes), although under its most optimistic assumptions the figure could be as high as 9 percent.

Other distribution platforms for digital television in the UK are HomeChoice (recently acquired by the internet service provider, Tiscali), which provides a broadband based video-on-demand service and two free-to-air satellite services, one from BSkyB and another from the BBC.

Taken collectively, the various multi-channel platforms now serve 85 percent of TV households in the UK; all but 1 percentage point of which receive digital services (the remainder rely on analogue cable).

3.2 Viewer Choice

When BDB's service launched in 1998 as ONdigital it offered a familiar combination of basic and premium packages. The basic package, priced at £9.99 (€14.50) a month for 14 or so channels initially, looked like a slimmed-down version of the basic packages available on satellite and cable and, indeed, included BSkyB's most popular basic package channel, Sky One. In comparison, BSkyB's basic "Family" package on satellite was priced at £11.99 (€17.40) a month and included 40 channels.

ONdigital also offered an entry-level package priced at £7.99 (€11.6) a month, which allowed the customer to choose six of the channels from the basic package. BSkyB's entry package was priced at £6.99 (€10.14) a month.

The premium package from ONdigital included a choice of Sky Movies, The Movie Channel and Sky Sports. BSkyB had considerably more premium channels to choose from including some near-video-on-demand pay-per-view channels.

The PSB channels, including the BBC's digital channels (BBC Choice, BBC Knowledge, BBC News 24 and BBC Parliament) and ITV2, were available on DTT without a subscription for the cost of a set-top box (STB).

ONdigital placed little emphasis on interactive or data services.

The package options are illustrated graphically in the diagram below, which also shows how channel choice evolved over time.

Figure 7 Summary of DTT service packages in the UK

	Free-to-air	Basic subscription	Premium
1998	12 x PSB + 1 or 2 others	ONdigital £7.99 (Eur 11.6) for 6 ch £9.99 (Eur 14.5) for all 14 channels inc: 8 entertainment 4 lifestyle 2 children's	£11 (Eur 16) for 1 ch £15 (Eur 22) for 2 ch £18 (Eur 26) for 3 ch Sky Sports 1 and 3 Sky Movies
2001	12 x PSB + 2 or 3 others	ITV Digital £9.99 (Eur 14.5) for 6 ch £11.99 (Eur 17.4) for all 16 channels inc: 8 entertainment 4 lifestyle 2 children's	As previously plus: ITV Sports etc
2002	Freeview 12 x PSB + 12 others inc: 3 entertainment 2 lifestyle 2 music channels		
2004	Freeview 12 x PSB + 15 others inc: 3 entertainment 5 lifestyle 2 music channels	Top-Up TV £7.99 (Eur 11.6) 11 channels inc: 3 entertainment 3 lifestyle 3 children's	Fantasy channel
2006	Freeview 12 x PSB + 15 others inc: 3 entertainment 5 lifestyle 2 music channels	Top-Up Anytime £9.99 (Eur 14.5) 16 "channels" inc: 5 entertainment 3 lifestyle 5 children's	Picture Box £5 (Eur 7) Setanta Sport £9.99 (Eur14.5)

Over the next three years, ONdigital looked to expand the choice of premium channels, not only by offering more Sky channels but also by introducing its own premium sports channel and pay-per-view services. It re-branded itself as ITV Digital in order to capitalise on the ITV brand and competed head-on with the other pay-TV platforms to acquire sports rights. The only true differentiators on the DTT platform were *Nationwide Football League* and *Champions League*. But consumer interest in these was poor compared to BSkyB's coverage of the premier league and the costs unsustainable.

By the time the licences for the commercial multiplexes were re-advertised in 2002, the number of DTT households had fallen to below 1 million and ITV and Channel 4 were in agreement with BBC that DTT should be offering a core package of 20 or so digital channels free-to-air (the choice had, in fact, already been expanding with a number of new channels from the BBC). However, ITV and Channel 4 insisted that there should also be a pay-TV option and so they and the BBC chose to submit separate applications.

The BBC's Freeview service launched in 2002 with a slightly reduced channel capacity in total due to the decision to change the transmission mode, which would help improve signal reliability. Nevertheless, it still offered a choice of 12 PSB channels (not including teletext and BBC Parliament) and around 15 other channels, including three from BSkyB (Sky News, Sky Sports News and Sky Travel).

By March 2004, the number of homes watching DTT had increased to 3.4 million (this included an estimated 0.5 million legacy STBs supplied by ITV Digital). Although there may have been some migration from the pay-TV platforms (a point which is discussed further in the next section) the rapid growth in take-up, which accelerated with the falling price of STBs, confirms the consumer demand for an expanded free-to-view package.

March 2004 also saw the launch of Top-Up TV, a pay-TV option on DTT that required a STB with a smartcard (conditional access) module. Top-Up TV is entirely separate from Freeview, both technically (it leases capacity gifted to Channel 5 on Multiplex A) and in terms of marketing. It offered a choice of 11 channels for £7.99 (€11.60) a month including UKTV Gold, Discovery Channel and Cartoon Network; some of which had not been available on DTT since the closure of ITV Digital. Also available, at a premium price, was the Fantasy Channel.

Top-Up TV's channel line-up failed to generate sufficient consumer interest and, in late 2006, it was re-launched as an on-demand service that requires the customer to purchase a STB/personal video recorder from Top-Up TV at a price of £140 (€200). Customers then pay £9.99 (€14.50) a month to access a library, updated overnight, of some 80 hours of programming from 16 channels including Disney, Nickelodeon and Paramount Comedy.

In addition, the digital PSB channels were, of course, available on satellite as free-to-view services from the BBC and BSkyB. BSkyB's Free-sat service enables customers to receive around 150 television channels (including the PSB channels) and several interactive services for a one-off fee of around £150 (€220) that includes a satellite dish, a set-top box and installation.

The increasing popularity of the free-to-view concept has resulted in more and more channel providers reviewing their business case and opting for an advertising-only funded model. Channel 4, for example, moved its E4 channel from the Top-Up TV package to free-to-view. With an increasing number of part-day channels, channel capacity has increased and the number of free-to-view programme channels now stands at around 45 (not including Top-Up TV's on-demand service).

3.3 Demand for DTT

3.3.1 The target market

Since the launch of ONdigital in 1998, the primary target market for DTT has been those homes that have not chosen to subscribe to the pay-TV services on satellite or cable or to invest in the equipment necessary to access the free-to-view channels on satellite.

ONdigital believed that the satellite dish was a barrier to entry for many people – a view that was endorsed by market research - and that for some, the prospect of having 200 channels to choose from was a disincentive. It believed that there was demand, within the 75 percent of homes that did not subscribe to pay-TV at the time, for a simplified multi-channel service that required no more than the existing (roof-top) television aerial and a "plug-and-play" STB. This was the basis for a business plan that would offer a choice of maybe 20 to 30 channels

for a relatively modest monthly subscription. In the words of Stuart Prebble, chief executive of ONdigital, the target audience was "Middle England".

Having attracted 1.25 million customers before going into administration, ITV Digital's offering clearly had found a niche in the market but, beset by other problems, it failed to achieve the subscriber levels needed for financial viability.

An ITC survey⁶, conducted a year after Freeview was launched, suggested that the DTT platform continued to appeal to a different audience from those drawn to satellite and cable. The demographic profiles across the various multi-channel platforms showed that many of Freeview's customers were more affluent and older, with no interest in purchasing pay-TV services on satellite or cable.

This view was confirmed by research undertaken the following year by Oliver & Ohlbaum on behalf of the BBC⁷, where it is argued that Freeview penetration was achieved largely additional to, rather than as a substitute for, digital pay-TV take-up.

As the table below illustrates, recent viewer research from BARB provides further evidence of the differing profile of Freeview households.

Category	Sub-set	Percentage distribution in:		
		All homes	BSkyB homes	Freeview homes
Size of household	1 person	32%	16%	34%
	2 persons	34%	34%	38%
	3 persons	15%	20%	14%
	4 or more persons	20%	30%	22%
Children	Yes	26%	38%	22%
	No	74%	62%	78%
Number of TVs	1	36%	24%	32%
	2	36%	36%	40%
	3	17%	22%	17%
	4 or more	11%	17%	10%
Individuals by age	0 – 15	16%	19.5%	13%
	16 – 34	25%	26.5%	21%
	35 – 44	16%	19%	14%
	45 – 54	14%	15%	15%
	55+	29%	20%	37%

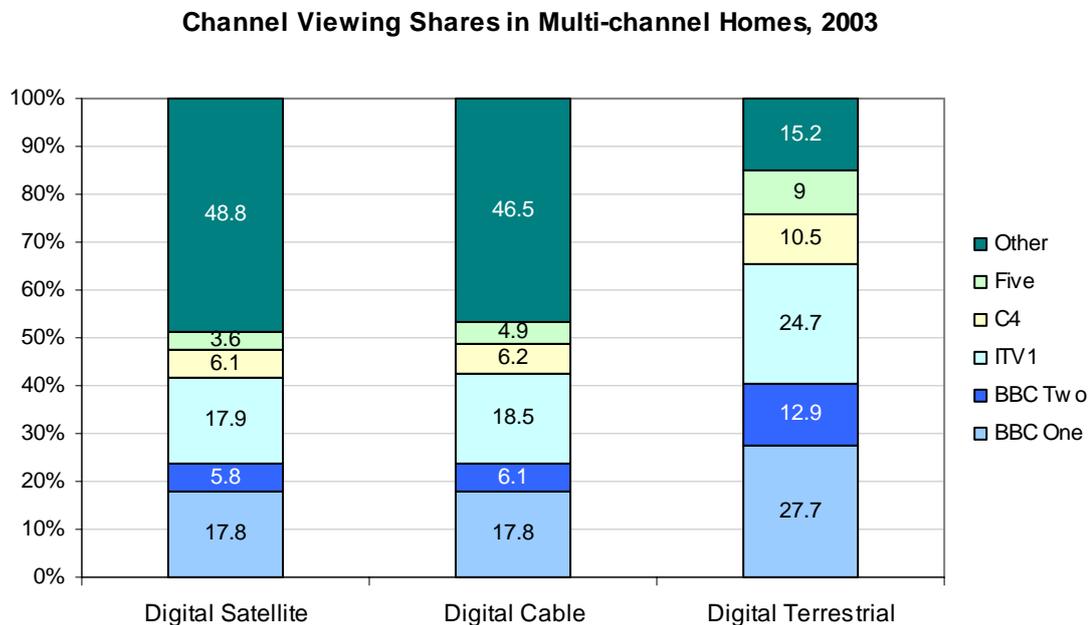
Source: BARB Establishment Survey, March 2007

⁶ Multi-channel Quarterly, Q2 2003, ITC
http://www.ofcom.org.uk/static/archive/itc/research/multichannel_q2_2003.doc

⁷ An Assessment of the Market Impact of the BBC's Digital TV Services, Report for the BBC's submission to the DCMS Review, Oliver & Ohlbaum, 2004 <http://www.culture.gov.uk/NR/rdoonlyres/B94AD9C5-463C-41F7-940A-5E2628DAD1E4/0/MarketImpactvfinal.pdf>

The different demographic profile of DTT households is reflected in their viewing habits, although the reduced range of channels is clearly an important factor. As the figure below illustrates, the PSB simulcast channels (BBC One, BBC Two, ITV1, Channel 4 and five) account for over 85 percent of viewing in DTT homes.

Figure 8 Comparison of viewing habits on different multi-channel platforms



Extracted from "Phase 1 Review of public service broadcasting", Ofcom, 2004⁸

In its licence application, the BBC/Crown Castle consortium identified the huge number of analogue televisions used for secondary viewing in bedrooms, kitchens etc, as its secondary target, noting that this could appeal to homes that already used satellite or cable for their primary TV sets.

3.3.2 The competitive impact of DTT

As indicated already, the impact of DTT on the pay-TV platforms to-date has been minimal, in terms of head-on competition for new subscribers with newcomers to DTT having been drawn substantially from the diminishing population of analogue-only households. That is not to say, however, that DTT – and specifically Freeview – is having no competitive impact on the market. Three aspects are worth considering further:

- The marginal impact on take-up of pay-TV;
- The increasing presence of DTT in pay-TV households for secondary viewing; and
- The growing interest among channel providers in a subscription-free business model.

One interviewee believed that Freeview has acted as a brake on further take-up of the basic entry packages available on satellite and cable. This is reflected in recent take-up figures across the various multi-channel platforms (see below) where growth in free-to-view (DTT and satellite) households in the second quarter of 2007 was around 9 percent, compared to just over 1 percent growth in pay-TV households over the same period.

Also, market impact assessments of the BBC's digital channels, carried out on behalf of both the BBC and Ofcom, acknowledge that there probably has been some migration to DTT from the satellite and cable pay-TV platforms (with estimates put at two to four percent of pay-TV households). These views, however, are derived from willingness-to-pay surveys rather than direct measurement of migration patterns.

⁸ *Phase 1 Review of public service broadcasting*, Ofcom, 2004
<http://www.ofcom.org.uk/consult/condocs/psb/psb/psb.pdf>

BSkyB's decision to launch its own free-sat service in 2004 may be seen as a response to the popularity of Freeview, and a way of persuading its free-sat customers to trade-up to a pay-TV package.

Figure 9 Current penetration of multi-channel television in the UK

Platform Take Up in Qtr 2 2007

	Q1 2007	Q2 2007	Net additions	Growth rate
Pay TV Digital Subscribers				
Digital Cable	3,088,371	3,132,571	44,200	1.4%
Digital Satellite (BSKYB)	8,008,000	8,085,000	77,000	1.0%
TV Over ADSL	62,000	62,000		
Total Digital pay TV subscribers	11,158,371	11,279,571	121,200	1.1%
Free-to-view digital households				
DTT (Freeview) only homes 4	8,376,000	9,139,000	763,000	9.1%
Free to View digital satellite 5	885,000	945,000	60,000	6.8%
Total Free to view households	9,261,000	10,084,000	823,000	8.9%
Total UK Digital Households	20,419,371	21,363,571	944,200	4.6%
Digital Penetration	80.50%	84.00%	3.50%	
Other multi-channel households				
Analogue Cable	310,054	272,454	-37,600	-12.1%
Multi-channel penetration	81.7%	85.0%	3.3%	

Extract from Ofcom's quarterly digital television (DTV) progress report⁹

Freeview is also proving to be a very popular means of converting secondary TVs to digital, even in homes where the primary TV is on satellite or cable. By June 2007, some 9 million DTT STBs or integrated digital televisions had been sold for use as secondary sets. It is possible that some homes have purchased multiple units for secondary viewing, and so the number of households that rely on DTT for secondary viewing will be somewhat less than 9 million. In comparison, there are currently 1.3 million households that rely on BSkyB's Multi-room service - priced at £10 (€14.50) a month on top of the normal subscription - to provide secondary sets with digital programmes. Equivalent figures are not available for cable. But, it would seem that DTT, certainly in its current free-to-air format, is proving to be a very popular solution for secondary viewing and, again, is acting as a brake on the take-up of satellite and cable's alternative offerings.

The impact of Freeview on programme channel providers concerns the fact that, increasingly, the balance is shifting away from a subscription-based business model (providing dual revenue streams from subscriptions and advertising) towards an advertising-only model. It has been suggested that channels large enough to hold around 1% market share can make a viable proposition from the latter approach. As explained below, increased demand for slots on DTT is pushing up the fees earned by multiplex operators. Furthermore, in the longer term, a substantial shift by programme channel providers could have implications for the pay-TV platform providers if they are not to lose the appeal of their basic packages.

3.4 Investment Proposition

This section of the report concentrates on three different business cases:

- A full pay-TV model (based on Carlton and Granada's investment in BDB, following the award of the three commercial multiplexes in 1998);
- A full free-to-air model (the BBC's investment in Freeview in 2002); and
- A light pay-TV model (based on Top-Up TV's launch of a pay-TV service on DTT in 2004).

3.4.1 Full Pay-TV Model (BDB/ONdigital/ITV Digital)

The business plans prepared by BDB for its pay-TV service in 1998 were submitted to the ITC in confidence. However, it is reported that ONdigital's owners expected to break even with

⁹ *The Communications Market: Digital Progress Report – Q2 2007*, Ofcom, Sept 2007
http://www.ofcom.org.uk/research/tv/reports/dtv/dtv_2007_q2/dtvq207.pdf

around 2 million subscribers. They failed, within the four years of operation, to get subscriber numbers above 1.25 million and in March 2002 ITV Digital, as it was then called, went into receivership, having made losses of £1.5 billion (€2.2 billion).

It is clear that it suffered two significant set-backs in its start-up phase that drastically changed the investment proposition, quite apart from its inability to attract sufficient subscribers. First was the insistence by the European Commission and the ITC that BSkyB withdraw from the BDB consortium while retaining its programming commitment. One interviewee explained that BDB's owners were given just two weeks to conclude an exit agreement and supply agreement with BSkyB, which left them in a weak bargaining position. The result was a supply contract that became a prime contributor to ONdigital's subsequent demise. Stuart Prebble, former Chief Executive of ONdigital is quoted as saying that the wholesale prices charged by BSkyB (for its premium channels) exceeded the retail prices it charged its own customers.

ONdigital (and the cable companies) wanted the competition authorities to reconsider BSkyB's position in the market. The Office of Fair Trading (OFT) had already investigated BSkyB's wholesale activities in its 1996 review and obtained a number of undertakings from BSkyB with regard to making certain services available on a non-discriminatory basis and revising its rate card for programme channels. A second review was launched in 2000 and this led to a full competition investigation into, amongst other things, whether BSkyB had been applying a margin squeeze on DTT and the cable companies. Its conclusion, in December 2002 (after ITV Digital had gone into administration) was that there was insufficient evidence to say that BSkyB had abused its position through operating a margin squeeze.

Secondly, ONdigital decided, in the wake of a similar decision by BSkyB, to provide subscribers with STBs at no charge. This removed a vital revenue stream and ONdigital had to compensate by increasing the prices for its entry-level and basic packages by £2 (€3.90) a month, which only served to lessen their appeal amongst a reluctant target market.

3.4.2 Full Free-to-Air Model (Freeview)

It is difficult to isolate the full investment made in establishing and operating DTT as a fully free-to-air proposition because Freeview was very much an incremental activity. In particular, the BBC was able to make its full range of digital channels available for the DTT platform (in 2003, the BBC's four main digital channels had operating costs of £170 million (€246 million)) and provide considerable amounts of cross-promotion from its analogue channels (for example, in the first three weeks after Freeview's launch, the BBC ran 70 information trails on BBC1 and BBC2).

The investment proposition for Freeview should be seen in the context of the BBC's commitment to digital television. As part of an enhanced licence fee determination in 2000 (based on an annual increase of retail price index plus 1.5 percent), the BBC was required to take on a key role in promoting digital television in general, as part of the government's strategy to accelerate progress towards switching off analogue transmissions. Part of the BBC's response was to introduce four new digital television channels, the funding of which was approved by government on the basis that they would be made available free at the point of use to licence fee payers throughout the UK.

At that time, the vast majority of viewers to the BBC's digital channels received them as part of a pay-TV package from ONdigital, Sky or one of the cable companies. Some viewers accessed the BBC's digital channels via satellite without subscribing to Sky but market research has shown that, in late 2001, there were only an estimated 300,000 homes that had the necessary satellite dish and receiver. The BBC believed that there would be significant consumer interest amongst non-digital households in purchasing a subscription-free STB in order to access the BBC's digital channels.

The BBC believed that DTT offered a relatively low-cost solution and research commissioned by it suggested that there would be substantial interest in a box priced around £99 (€144) from people who were not interested in cable or satellite. The BBC wanted to develop an alliance with other broadcasters who were interested in providing a subscription-free service and to work with manufacturers on pushing down the cost of STBs.

The BBC's plans required more capacity than it had available on Mux 1 and so it was considering acquiring capacity on one of the other multiplexes. Within a few months, however, ITV Digital was put into administration and the licences for the three commercial multiplexes were re-advertised by the ITC. This posed both an opportunity and a threat to the BBC. Here was the chance for the BBC to realise its plans for a free channel package by

applying for an additional multiplex. If DTT failed as a platform, then the investment that BBC had made to date in establishing its services on DTT would be lost - according to a report by the Comptroller & Auditor General¹⁰ (C&AG), the BBC had spent around £50 million (€72 million) so far on digital terrestrial transmission.

The BBC, under the leadership of its recently newly-appointed Director General, Greg Dyke, decided to develop a proposal to bid for one of the multiplexes and began discussions with a variety of potential partners. The BBC had had discussions with ITV and Channel 4 but the latter two broadcasters wanted to retain an element of pay-TV in the service offerings and so they made their own application for the multiplexes.

Ultimately, it made a cooperative application with Crown Castle (one of the two operators of the DTT network in the UK) under the banner of "the Consortium". The BBC would hold the licence for Mux B and Crown Castle would have the licences for Mux C and Mux D. Despite this splitting of the multiplexes between the two partners, a single service, subsequently called Freeview, was to operate across all three multiplexes.

Although not a member of the Consortium, BSkyB was involved in the BBC/Crown Castle proposal. The three organisations reached an agreement to put in place a comprehensive marketing plan to promote DTT and created a separate company, Digital Television Services Limited (DTSL), in which they each had a 33 percent share. BSkyB provided funding, along with its experience of promoting digital television and running call centres. In return, BSkyB was able to increase awareness of the Sky brand and to increase viewing and advertising revenue from the three channels (Sky News, Sky Sports News and Sky Travel) that were part of the Freeview package.

The BBC's investment in Freeview was estimated to be around £11 million (€16 million) a year over the 12 year licence period. These costs were largely to cover transmission costs of just under £8 million (€11.6 million) a year for Mux B, coding and multiplexing charges of approximately £1.5 million (€2.2 million) for Mux B and a contribution of just over £1 million (€1.5 million) a year in the early years to the marketing costs of DTSL (it was recognised by the BBC that this figure may have to increase in later years to persuade reluctant adopters).

Based on these proposals, the BBC believed that the number of households with DTT would grow steadily from the 2002 figure of 1.0 million (equivalent to 4 percent of TV households) to 9.4 million homes (35 percent of TV households) by 2014.

In confirming the decision to submit its licence application to the ITC, the BBC Governors stated that it was:

"Content to spend approximately 1.5 percent of the BBC's annual income on distributing BBC channels to a proportion of the population".

As explained in its summary application¹¹, the Consortium believed that success would rest on three key initiatives:

- Changing the transmission regime with the aim of increasing coverage by around 50 percent and reduce the numbers affected by interference from the then 50 percent to an estimated 10 percent;
- Attracting viewers by establishing a completely free DTT offering consisting of approximately 24 channels across all six multiplexes (a consequence of the proposed change in transmission mode to improve coverage was a decrease in the number of channels from 36); and
- Building consumer confidence in DTT as an alternative platform by making a long-term commitment to establishing a free-to-view service where the only commitment required of the consumer is the purchase of a STB for £99 (€144).

The BBC was unable to persuade Channels 3 and 4 to change its transmission mode, which remained at 64QAM, but it otherwise succeeded in realising its strategy. In its review of the BBC's investment in Freeview in 2004, the C&AG stated that, in its view, the BBC had fully met two of its objectives, namely:

¹⁰ *The BBC's investment in Freeview*, National Audit Office, May 2004
http://www.bbcgovernorsarchive.co.uk/docs/reviews/bbc_nao.pdf

¹¹ The Consortium's summary application for multiplexes in 2002, ITC legacy website
http://www.ofcom.org.uk/static/archive/itc/latest_news/multiplex_licence/index.asp.html

- To secure the future of the DTT platform; and
- To launch Freeview according to the planned (ambitious) timetable;

And had partially met its two other main objectives, namely:

- To ensure that people could receive BBC digital channels without paying a subscription fee; and
- To increase awareness of subscription-free access to BBC digital channels.

Limitations on nationwide access to digital channels were in large part due to DTT coverage restrictions that could not be resolved until analogue transmissions were switched off. Also, at the time of the review, there was still considerable confusion among consumers about the costs involved in adopting DTT; although the situation improved as the marketing campaign was refined.

In addition, the BBC had itself identified two value-for-money criteria for measuring the success of its investment in Freeview:

- The take-up of DTT; and
- The cost to the BBC of providing its digital channels to DTT households.

Since the costs are largely fixed, the second criterion is essentially a restatement of the first criterion. Although these are supplementary to the BBC's main objectives, they provide some measure of whether the BBC considered its investment in Freeview a "success". At the time the Comptroller & Auditor General carried out his review of the BBC's Freeview investment in early 2004, DTT penetration had reached 14 percent of all UK households, compared to a projected 9 percent. Similarly, the cost per DTT household was actually £8 (€11.60) a year, well below the projected figure of £12 (€17.40) a year. The BBC had already stated that £12 a year did not represent value for money but, unfortunately, it did not say what was considered an acceptable threshold. The delivery cost of satellite is around £3 (€4.35) per household.

Nevertheless, the above-target penetration figures (DTT take-up has continued to outpace the BBC's original projections, reaching 8.4 million homes by 2007 Q1 compared to an original projection of 4.3 million) was undoubtedly a success.

The financial implications of this substantial success are reflected in the escalating fees paid to Crown Castle for capacity on its two multiplexes. It is reported that in April 2005, ITV paid over £5 million (€7.25 million) a year for a channel slot on Mux D with Channel 4 paying a similar amount for a second available slot. That is believed to be around five times the amount paid per channel when Freeview launched in 2002. Later the same year, Crown Castle was said to have received bids from ITV, Channel 4, Disney, MTV and Top-Up TV for another slot that became available with the final price exceeding £10 million (€14.5 million).

3.4.3 Light Pay-TV Model (Top-Up TV)

Founded by a former BSkyB executive, Top-Up TV was launched on DTT in March 2004 offering 11 channels for £7.99 (€11.6) a month.

Top-Up TV is a private company and so little information is in the public domain. It was reported to require 250,000 subscribers within two years to break-even but, according to reports, take-up was slower than forecast and, in 2006, the company underwent a re-structuring. Multi-channel viewers typically watch only around ten channels; the challenge for service providers is that the mix of channels varies from one viewer to another. A view expressed by one interviewee is that Top-Up TV simply had insufficient channels to appeal to provide sufficient flexibility for an audience with disparate tastes.

Top-Up TV's offering has now changed from being a pay-TV package to a video-on-demand service, with some 80 hours of programming made available and updated over-night from a wider range of channel providers. It remains to be seen whether this is sufficient to establish a viable business proposition.

3.5 Other Key Financial Considerations

Other factors that have had a key influence on the financing of DTT in the UK relate to:

- Government concessions/incentives;
- State-aid; and
- Consumer take-up costs.

These are considered in more detail below.

Government Concessions and Incentives

There is a limited amount of radio spectrum that is suitable for DTT services and, consequently, this scarce resource carries with it an economic cost. In a concession from government, multiplex operators were not required to make any payment to government in recognition of their use of spectrum for the duration of the first licence period (12 years). This decision was consistent with the government's aim to promote the development of DTT.

The option remains for a charge to be introduced upon licence renewal although a new scheme, Administered Incentive Pricing (AIP), has since been announced and will come into effect in 2014. Further details are provided in Section 4.4.

This concession was reflected in arrangements that applied specifically to ITV's PSB service, which was simulcast on digital. At the time DTT was first launched, the various ITV regional companies were paying in the order of £300 million (€435 million) a year to government for their analogue spectrum and, under the terms of these so-called Additional Payments, the amount paid was reduced in proportion to the number of homes that switched to DTT. This was, at the time, regarded as a substantial incentive although in subsequent reviews of the (analogue) Additional Payments, the amounts have reduced substantially and the incentive effect has been diluted accordingly.

A further incentive that was offered to ITV in particular, was a relaxation in the requirements for sub-regional variations in programming (which would have added to the complexity and cost of the DTT transmission arrangements).

State-aid

Money from the obligatory television licence fee has been used to fund several aspects of the BBC's involvement in DTT, including support for digital television in general (through the development of several new digital programme channels), digital switchover (in terms of funding the marketing campaign and contributing to the costs of Digital UK) and financing Freeview (through its participation in the Consortium). Such funding may amount to state-aid and, as such, is subject to rules set down by the European Commission¹². Principles to be adhered to include:

- Technologically-neutral;
- Non-discriminatory;
- Transparent;
- Justified;
- Proportionate; and
- Timely.

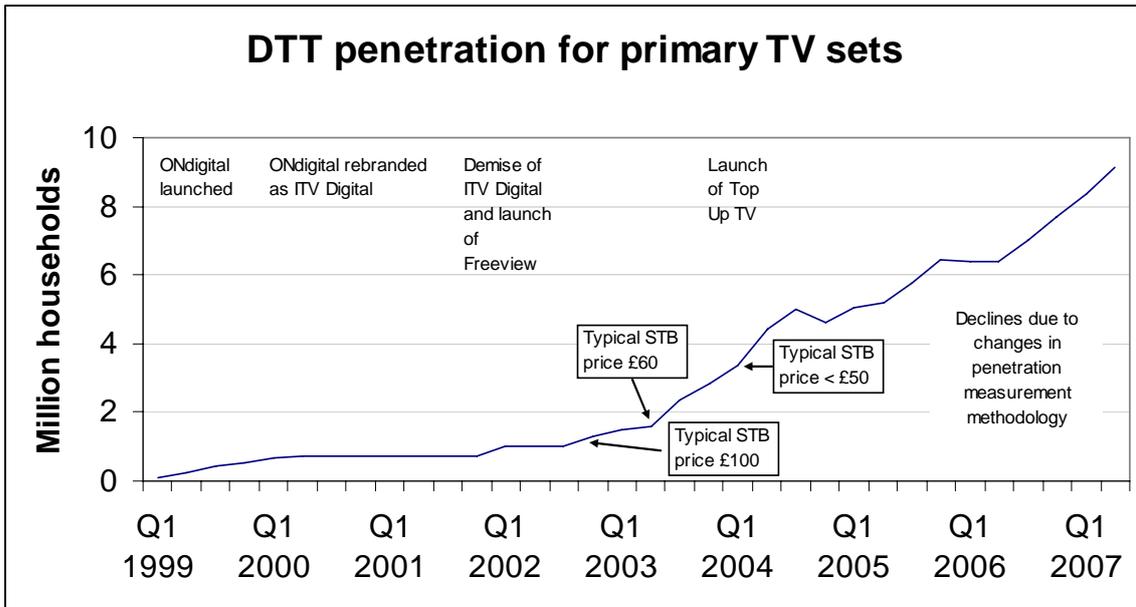
Although some early proposals for BBC spending drew fierce criticism from the likes of BSkyB and, as a matter of course, government has referred certain matters to the European Commission for its consideration, there has not been any adverse decisions. It is worth noting, however, that the rules on state-aid do affect the way in which digital switchover is being implemented in the UK. This is discussed further in chapter 5.

Consumer Take-up Costs

When the ITC first advertised the multiplex licences in 1997, the cost of a set top box was nearly £200 (€290), which was considered a significant entry barrier for many consumers. Applicants were therefore invited to submit, and be judged on, their proposals for subsidising the retail price. ONdigital's subsequent decision to provide them free-of-charge to subscribers added further to its financial burden.

As the figure below illustrates, the situation has changed substantially in the meantime. By the time Freeview was launched, the typical STB price was below £100 (€145) and is now well below £50 (€72) (one supermarket chain has recently promoted a Freeview STB for around £10 (€14.50)). Of particular note is the accelerated take-up that took place once STB prices fell to £60 (€87).

¹² *Communication on the application of State aid rules to public service broadcasting*, European Commission, 2001 http://eur-lex.europa.eu/LexUriServ/site/en/com/2003/com2003_0541en01.pdf



Source: Ofcom's quarterly digital television (DTV) progress report; BBC; others.

Another element of consumer take-up, which has assumed more importance recently, is the cost of upgrading aerial installations, especially for secondary TVs, which tend to have only a set-top aerial.

3.6 Commentary

When the emphasis was on applying a pay-TV model to DTT, there was much criticism of the power held by BSkyB who both held the rights to certain programme content that was considered essential and competed at the retail level. The fear was that a vertically-integrated platform operator like BSkyB could apply a margin squeeze on providers of competing platform services. There has since been some change in the situation, both in terms of the shift towards a free-to-view model for DTT and the European Commission's decision on sports rights¹³, which has allowed Setanta to gain access to key sports rights and develop its pay-TV offering. But in doing so, new questions arise:

- Was the development of DTT as a fully free-to-air platform uniquely dependent on the BBC's involvement? and
- Does the resulting mix of programme channels on a FTA platform provide an adequate range of choice for viewers?

With regard to the first question, Ofcom, in its 2004 assessment of the market impact of the BBC's new digital services, stated that Freeview was central to DTT's success, both through the enhancement of the DTT service by its digital channels and through the BBC's backing and cross-promotion for the DTT platform. Interviewees have suggested that this role did not have to be fulfilled by the BBC but it was difficult to conceive of an economic model in 2002 that would have been commercially viable (coming, as it did, so soon after the dot.com bubble burst, the advertising market slumped and ITV Digital was put into receivership). Modelling work carried out for the ITC by its merchant banking advisers at the time suggested that break-even on an advertising-funded platform would require five million viewers. With ITV Digital only having achieved 1 million or so, such a target would have looked unachievable.

The second question is very much a live topic in the UK, with BSkyB's proposal to remove its free-to-air channels from DTT and replace them with a pay-TV offering prompting a review by Ofcom that will consider this amongst other issues. It is perhaps too soon to say whether Top-Up TV in its new Anytime format and Setanta, which now offers a pay service on DTT in collaboration with Top-Up TV, will provide business models with wider application; although there is news of another pay-TV service being launched on Freeview (and IPTV) later this year by Play TV following in the footsteps of Top-Up TV's Anytime service with a virtual video on-demand format.

¹³ Joint selling of the media rights to the FA Premier League, European Commission, March 2006 http://ec.europa.eu/comm/competition/antitrust/cases/index/by_nr_76.html#i38_173

4 Regulatory Framework

This chapter considers the legislative background to DTT before going on to describe the licensing structure, including how it has evolved to accommodate digital switchover. This is followed by a description of the two rounds of licence award and an assessment of the framework.

4.1 Legislative Background

There are three key pieces of legislation relevant to the development of DTT in the UK:

- **The Broadcasting Act 1990** established the Independent Television Commission as the independent regulator for broadcasting and set a general framework for regulating broadcast programme services;
- **The Broadcasting Act 1996** set out the regulatory framework for DTT;
- **The Communications Act 2003** introduced Ofcom as the new broadcasting regulator, amended the general telecommunications framework in the UK to align it with the European Union's directives and included provisions for a number of changes to DTT regulation.

Details of the two more recent acts, in so far as they relate directly to DTT, are provided in Annex 3.

One further piece of legislation to mention in passing is the Digital Switchover (Disclosure of Information) Act currently going through Parliament. This will enable the Help Scheme to identify people who are eligible and write to them directly inviting them to apply for help.

4.2 Licence Format, Codes etc

4.2.1 Multiplex Licences

Copies of the multiplex licences, including several amendments, are available on Ofcom's website¹⁴, although information of a financial nature and other commercially-sensitive details are excluded from the public version of the licences.

The main provisions contained with a multiplex licence that are most pertinent to DTT are:

- Provision of the multiplex service (Clause 2);
- Fees and additional payments (Clauses 3 and 4);
- Transmission arrangements, technical standards and requirements (Clause 6);
- Availability of capacity (Clause 7);
- Fair and effective competition (Clause 10);
- Conveyance of unlicensed services (Clause 14); and
- Publication of tariffs (Clause 18).

These are considered in more detail in the following paragraphs.

Clause 2 stipulates the programme and additional services to be broadcast on the multiplex and the transmitter sites from which the services will be broadcast. Thus, any change in the channel line-up requires the licensee to seek a licence amendment. This is made with reference to the proposals put forward in the licence application and is replicated in one or more annexes to the licence. Thus, in the case of the three commercial multiplex licences awarded to the BBC and Crown Castle in 2002, there was a commitment to provide the service on a free-to-air basis. As explained further below, under the sub-heading **FTA Licence Relaxation**, Ofcom has subsequently amended this condition.

The licences for Mux 2, operated by Digital 3 & 4 Ltd, and Mux A, operated by SDN, contain obligations to reserve some of the available capacity for PSB services.

Clauses 3 and 4 detail the obligations regarding licence fees and additional payments (i.e. payments to the government for the use of spectrum). These are discussed in detail in Section 4.4 below.

Transmission arrangements, technical standards and requirements are dealt with in Clause 6. In particular, the licensee is obliged to ensure that the service:

¹⁴ <http://www.ofcom.org.uk/tv/ifi/tvlicensing/multiplexlicensees/>

- Complies with the Digital Technical Performance Code;
- Complies with the Code of Practice on Changes to Existing Transmission and Reception Arrangements;
Follows the guidance note on test transmissions;
- uses a transmission system complying with Article 2 of Council Directive 95/47/EC on the use of standards for the transmission of television signals; and
- Where the Commission specify a particular Community digital standard in accordance with Section 142 of the 1996 Act (the "Community Digital Standard"), uses a transmission system meeting the Community Digital Standard.

Clause 7 deals with availability of capacity and the need to ensure that at least 90 percent of available capacity, as stipulated by legislation, is used for the transmission of digital programme services, qualifying services, programme-related services or relevant technical services¹⁵.

In Clause 10, on fair and effective competition, there is the familiar obligation to not behave in a manner that would be prejudicial to fair and effective competition nor to act discriminately towards programme service providers and to adhere to any competition guidelines, directions etc issued by the ITC. In addition, the licence makes the following specific stipulations:

- to do everything possible to facilitate service reception on open-standard digital television receivers (i.e. one that does not contain an embedded conditional access system);
- to not enter into any agreement for provision of programme services for a fixed term greater than 5 years without prior permission from the ITC;
- multiplex operators are prohibited from restricting a DTPS or DTAS licensee from trading its multiplex capacity unless it is reasonably required to ensure the technical quality of the broadcasts or to maintain compliance with one or more licence conditions.

With regard to the conveyance of unlicensed services, in Clause 14, all programme and additional services must either be licensed under the 1996 Act unless provided by a person established and, if necessary, licensed in another European Economic Area member state.

Finally, in Clause 18, the licensee is required to publish list of tariffs in accordance with Advanced Television Services Regulations 1996, or to ensure that providers of licensed programme services do so.

The other clauses within the multiplex licence are typical of most broadcast licences and are summarised in the table overleaf.

FTA Licence Relaxation

When the multiplex licences were awarded to BBC Free-to-View Limited and Crown Castle (now part of National Grid Wireless) in 2002, they contained a condition that the services carried on the multiplexes would be available to viewers free of charge (there is no similar restriction in the licences for the PSB multiplexes). This reflected the commitments made by the two organisations in their licence applications and was considered important, in part at least, because of the involvement of BSkyB as a channel provider to Crown Castle. It was considered important by the regulator, given BSkyB's control of the competing satellite platform, to limit the number of channels it could provide on DTT to three and to ensure they would be free-to-air.

In 2005, Ofcom reviewed the relevance of retaining the FTA condition. The main arguments for doing so rested on the fact that Top-Up TV, or any other provider of pay-TV services, would be very limited in its ability to expand its DTT service. First, the relative scarcity of "pay-TV capacity" may result in DTT capacity prices being higher than they might otherwise be, thus potentially limiting the services available to consumers, and producing a sub-optimal use of spectrum. Secondly, whereas commercial FTA broadcasters had to rely on an advertising-funded business model and would therefore, arguably, aim at attracting the widest possible audience with an entertainment-led programme mix, pay-TV channel providers are more likely to appeal to niche audiences; thus, Ofcom may better serve its obligation to provide viewers with a wide range of programme choice by not limiting DTT capacity to FTA usage.

¹⁵ Qualifying services are the simulcast versions of the various analogue PSB services; programme-related services include facilities such as Electronic Programme Guides; and relevant technical services include any encryption data.

Table 1 Summary of Multiplex Licence Conditions Common to Most Broadcast Licences

Topic	Details
Provision of information to the ITC	Relates to notification of changes in ownership and control; access to equipment and financial records; provision of statutory and other reports; provision of post-transmission schedules, performance data and video recordings; provision of information concerning programme service providers.
Licence renewal	On application. Refusal may only be given in event of actual or anticipated failure to comply with licence conditions
Restrictions on licence holders	Compliance with Schedule 2 of the 1990 Act
Transferability	Licence not transferable without prior written consent of ITC
Compliance	Obligation to comply with relevant guides and codes and future directions from ITC; adequate knowledge, resources and power within licensee's organisation to ensure compliance.
Government directions	Obligation to comply with directions issued by government regarding the inclusion or exclusion of certain announcements or other matter.
Complaints from public	Requirement to put complaints handling procedure in place.
Variations in licence conditions	ITC has right to vary licence period and conditions.
Equal opportunities	Obligation to promote equal opportunities in employment.
Notices	Details for serving or receiving formal notice.
Limitations on obligations	Licensee not responsible for any failure in service provision caused by circumstances outside its control.
Sanctions	Details the limits on financial penalties that may be imposed by the ITC on the licensee for failing to comply with a licence condition or direction.
Revocation	Details the circumstances under which the ITC may revoke the licence, and the procedures to be followed when doing so.

The main counter-arguments were that the FTA restriction helped to prevent any pay-TV operator having undue influence on the DTT platform and possibly curtailing the take-up of DTT in the run-up to digital switchover and that, because of the typical duration of contracts between multiplex operators and programme providers, there was unlikely to be any sudden shift from FTA to pay-TV channels anyway. Moreover, after switchover, an increase in DTT capacity was expected and this would help relieve any pressure for pay-TV capacity in the longer term.

Following a consultation on the issue, Ofcom issued a statement in April 2006¹⁶, confirming that, with regard to the three multiplex licences held by BBC Freeview and NGW it was:

"...minded to remove the requirement in response to a request from each licensee without further public consultation."

This was soon tested when NGW, the licensee for Mux C, and BSkyB requested that the existing three Sky channels on DTT be removed from the FTA service and the released capacity be used to provide three Sky channels on a pay-TV basis. Given BSkyB's strong position in the market, and contrary to certain expectations, Ofcom announced that it would issue a public consultation on the matter. Ofcom has indicated that the consultation had to be

¹⁶ *Pay TV channels on multiplexes B, C and D*, Statement from Ofcom, April 2006
<http://www.ofcom.org.uk/consult/condocs/paytv/statement/statement.pdf>

delayed because BSkyB had not furnished sufficient information and it is now due to commence in September 2007.

The concept of a general multiplex licence was also introduced in the 2003 Act. Although none has been issued yet, it is understood to facilitate the introduction of spectrum-based charging for broadcast licences. This topic, along with an explanation of the current licence fee structure, is discussed in further detail in Section 4.4 below.

4.2.2 Digital Television Programme and Additional Service Licences

Digital terrestrial programme licences are available to any applicant who is a fit and proper person and is not disqualified by virtue of the ownership restrictions in Schedule 2 of the Broadcasting Act 1990, as amended by the 1996 Act. The holder of such a licence will only be able to provide a programme service through a contract with a multiplex provider and subject to the multiplex provider's licence conditions; confirmation of this by the multiplex operator is required when applying for the licence.

A draft licence for each service type is available on the Ofcom website¹⁷. Key conditions relevant to a programme licence (DTPS) are summarised below. Annexed to the licence would be the details of the multiplex on which the service will be carried and a description of the service in terms of its name, nature and hours of transmission.

Figure 10 Summary of key conditions for DTPS licence

Condition	Requirement
Independent production quota	Must ensure that in each year not less than 10 per cent of the total amount of time allocated to the broadcasting of qualifying programmes included in each service in the Licensed Service is allocated to the broadcasting of a range and diversity of independent productions.
Advertising and programme codes	Must comply with the <i>Ofcom Broadcasting Code</i> (for programmes, sponsorship and fairness and privacy) (http://www.ofcom.org.uk/tv/ifi/codes), the <i>Rules on the Amount and Distribution of Advertising (RADA)</i> (http://www.ofcom.org.uk/tv/ifi/codes/advertising/rules/rules.pdf) and the <i>BCAP Television Advertising Standards Code</i> .
Listed events	Restriction on the acquisition of exclusive rights to the whole or any part of live television coverage of listed events and the broadcasting on an exclusive basis of such coverage without the previous consent of Ofcom. Ofcom publishes a Code on Sports and other Listed Events (http://www.ofcom.org.uk/tv/ifi/codes/code_sprt_lstd_evts/#content)
Sub-titling, signing and audio-description	A television service achieving an average audience share of all UK households of 0.05% or more may be required to provide subtitling, signing and audio description, subject to passing an affordability threshold and not facing technical difficulties that are impracticable to surmount. These obligations would apply from the first anniversary of the launch of the service. http://www.ofcom.org.uk/tv/ifi/codes/ctas/#content sets out the targets
European production quotas	Licensees must meet the requirements for European productions in Articles 4, 5, and 6 of the Television Without Frontiers Directive.

4.2.3 Digital Replacement Licences

In 2004, Ofcom invited Channels 3 and 5 to accept Digital Replacement Licences (DRLs) in lieu of its existing PSB licences (which were primarily for their analogue services). Channel 4's existing licence was also replaced although the procedure was slightly different in that the licence was effectively imposed on the broadcaster, having had the opportunity comment on it in advance.

¹⁷ http://www.ofcom.org.uk/tv/ifi/tvlicensing/guidance_notes_and_apps/

These DRLs helped pave the way for digital switchover (DSO) by introducing a number of provisions including:

- Inclusion of coverage obligations to be achieved by switchover (mirroring similar obligations in the multiplex licence that carries the service);
- A requirement to cooperate with other (unspecified) parties in working towards switchover;
- Provision of an annual progress report on DSO;
- Requirement to inform viewers on certain aspects of DSO;
- Introduction of a back-stop date for DSO.

4.2.4 DSO Licence Amendments

Ofcom followed up on the DRLs in July 2006 with a consultation on its proposals for amending the multiplex licences. Its final statement of findings was issued in December that year¹⁸ and included several items that largely paralleled the additions to the DRLs (except that DSO planning had progressed in the meantime and certain commitments were made more specific):

- Incorporation of coverage obligations into the multiplex licences that reflect the commitment to achieve DTT coverage for the multiplexes carrying PSB services equivalent to that of the existing analogue transmissions (i.e. 98.5 percent of the UK);
- Obligation to cooperate and communicate with other parties regarding DSO;
- Annual reporting on DSO;
- Communicating with viewers;
- DSO date and timetable;
- DTT broadcasting stations.

4.3 Licensing Process

As set out in the 1996 Act, Mux 1 was reserved for the BBC and the remaining five were licensed by the ITC, which effectively ran three processes in 1997/98 to issue them:

- The three commercial multiplexes (B, C and D) were awarded by comparative evaluation, having received interest from two applicants - British Digital Broadcasting (BDB) and Digital Television Network (DTN);
- The non-reserved 50% capacity on multiplex A was advertised, but only one application was received, from S4C Digital Network (SDN); and
- The reserved capacity on multiplex A and multiplex 2 was already destined for the commercial PSB channels (Channels 3, 4 and 5 and S4C), but the broadcasters were still required to submit formal applications.

When ITV Digital went into administration in 2002, the ITC followed essentially the same process when re-advertising the licences for Mux B, C and D and so the following description applies to both the 1998 awards and the 2002 awards.

In furthering the aim set out in the 1996 Act to promote the development of digital television, the ITC wanted to allow maximum flexibility in how licences were distributed. Each licence was advertised separately and, since there were no restrictions on the number of licences that could be held, applicants were free to submit multiple applications. Applicants were also free to submit a single application for multiple licences, should they wish to demonstrate certain benefits from holding two or more licences. Consequently, the ITC received multiple applications from BDB and SDN covering various licence permutations.

Also, in 2002, applicants were allowed to make conditional applications (thus enabling the BBC and Crown Castle to make applications for Mux B and Muxes C and D respectively that were conditional on the other party being successful in its application).

The ITC's Invitation to Apply¹⁹ set out the required format for the applications, the criteria to be applied in determining successful applicants and certain background information. Each of these areas is considered in further detail below.

Background Information

The ITC's Invitation to Apply provided considerable planning information for the transmission network including the predicted coverage for each of the multiplexes based on the ITC's

¹⁸ *Switchover related changes to DTT Licences*, Ofcom, December 2006

http://www.ofcom.org.uk/consult/condocs/dtt_changes/statement/statement.pdf

¹⁹ *Multiplex Service Licences: Application Documents*, ITC, May 2002

http://www.ofcom.org.uk/static/archive/itc/uploads/Invitation_to_Apply_for_Multiplex_Service_Licences_22_May.doc

planning assumptions. Most crucially, these coverage figures were for homes with properly installed aerials and STBs. They did not provide coverage capability based on a “plug and play” basis. These figures were revised for 2002 to reflect an anticipated doubling in transmitter power.

The document reminded applicants that they could propose any combination of free-to-view and pay-TV services and, in 2002, invited applicants to give the earliest indication if they thought that their proposal would be enhanced if the existing 10 percent limit on data capacity were relaxed to 20 or 30 percent. Similarly, applicants were offered the possibility of moving away from the original 64QAM transmission mode.

The Invitation to Apply also included a draft multiplex licence, provided guidance on various licence conditions and referenced 14 guidance and code documents available on the ITC website. These included:

- Technical notes on coverage, transmission standards, performance code etc;
- The ITC’s codes for sub-titling etc;
- Guidance notes on ITC sanctions;
- Rules on the promotion of programmes, channels and related services; and
- Guidance on competition procedures.

Application Format

An application had to consist of:

- a non-returnable application fee (in 2002, this was set at £25,000 (€36,250) for each licence);
- a written application in two parts (Part A covered the nature of the service and Part B, the financial and other confidential information);
- a written summary of essential features of the application, including proposed programme channels to be carried (which would be available for public scrutiny at the ITC’s offices).

The written elements had to be supplied in both hard-copy and electronic formats. For Part A, the applicant had to provide details of its commitment to:

- transmission coverage and roll-out;
- promotion and assistance for acquiring reception equipment; and
- the number and characteristics of the programme and additional services.

If the applicant were successful, these commitments would be written into the licence.

Part A also had to include supporting information covering:

- how the proposals contributed to promoting the development of DTT;
- details of where programmes would be sourced from, including details of any agreements already in place;
- details of key staff within the proposed multiplex operator; and
- the identity of the applicant.

For Part B, the applicant had to provide:

- a detailed business plan;
- profit & loss, cash-flow and balance sheet projections for the full licence period, supported by details of the underlying assumptions and an accountant’s letter confirming that the projections were properly prepared;
- audited accounts for the applicant, or a suitable alternative if it was not established as a corporate body; and
- details of the funding arrangements, including evidence that it had the funding necessary to sustain the business for the duration of the licence.

The Invitation to Apply included templates for the financial projections (the table below shows the breakdown required for the expenditure side of the profit & loss projections) and included a declaration that had to be signed by the directors representing the applicant. This covered several factors with a view to determining that the applicant, or other connected persons, was not a disqualified person within the terms of the 1990 Act.

Table 2 Extract from the template for financial projections in the 2002 Invitation to Apply

Expenditure lines in the P&L projections
Programming Service Costs – basic
Programming Service Costs – premium
Marketing and sales
Subscriber acquisition
In-house transmission/distribution
External transmission/distribution
Conditional access costs
EPG management
Subscriber management
Billing/collection costs
Administration/central overheads
Start-up and integration costs
ITC licence fee
Depreciation and leasing
Other operating costs

Where an application was unclear, the ITC would seek written clarification from the applicants and reserved the option to meet with applicants. It did not hold public hearings, but it did invite representations on the summary proposals that were put in the public domain.

Selection Process

The 1996 Act set one over-arching requirement with regard to selection, and that was that the ITC had to have regard to the extent to which the award of a licence would be calculated “to promote the development of digital terrestrial broadcasting in the UK, otherwise than by satellite”. In following this less than platform-neutral stipulation, the ITC was required to take into account several criteria that were also specified by the Act, namely:

- The extent of the coverage area proposed to be achieved;
- The timetables proposed for achieving the coverage;
- The ability to establish and maintain the proposed service;
- The capacity of the proposed digital programme services to appeal to a variety of tastes and interests;
- Any proposals for promoting or assisting the acquisition by consumers of equipment capable of receiving all multiplex services in their area; and
- Whether in contracting with persons providing digital programme services, the applicant has acted in a manner calculated to ensure fair and effective competition.

As required by the 1996 Act, the ITC also gave guidance on the minimum requirements considered acceptable for three of the criteria. For the 2002 round, these were as follows:

- The service must commence as soon as is practicable, and preferably immediately, after the time of licence grant using all 80 transmission sites;
- The licensee should have a policy towards improving coverage in future that is consistent with the development of a successful digital terrestrial TV operation in the UK; and
- The licensee must have a receiver promotion plan in place. In assessing this plan, the ITC will have regard to the extent to which it ensures that arrangements are in place which are compatible with a rapid re-establishment of full service provision to viewers.

During the 2002 round, the ITC also stated that, in considering how each applicant would promote the development of digital television broadcasting in the UK, it would also give account to:

- The desirability of re-establishing a full service to viewers as quickly as possible; and
- The Ability of the applicant, or applicants, to operate the multiplexes from the date of grant in a co-ordinated way.

The Invitation to Apply did not indicate what weighting would be applied to each of the criteria and, as with previous licence awards, the ITC did not follow a formulaic approach to assessing each criterion. Unlike the procedure adopted in some other comparative evaluations for awarding licences, there was no script or evaluation specification detailing precisely how each of the criteria should be interpreted and points awarded. Consequently, the task for the ITC staff was to provide a comprehensive and unbiased appraisal of each application against each of the criteria in turn and to present its findings to the Commission Members. Where the criterion, or aspects of it, could be expressed in quantitative terms then comparative tables were prepared.

The table below compares the timescales involved during the two rounds of licensing the three commercial multiplexes; because of the urgency of the situation, they were considerably fore-shortened in the 2002 awards.

Time allowed to:	1998 award	2002 award
Prepare application	13 weeks	4 weeks
Select successful applicant(s)	48 weeks	< 3 weeks
Launch service	48 weeks	16 weeks

During the first round, the ITC effectively had three teams working on the applications, one looking at the programming proposals (Part A of the application), one looking at technical considerations and a third assessing the financial details (Part B). The time taken to evaluate the applications and select the successful applicant was probably extended because of the European Commission's involvement in BSkyB's proposed participation in BDB. But, even so, the reduction in the time taken from 48 weeks to less than three weeks is huge. The disparity is even more marked when one considers that there were only two applicants for the three commercial multiplexes in 1998 and four in 2002. Reasons for the reduction are:

- There was a clear urgency to ensure that the DTT platform survived and so deadlines were deliberately kept very tight (for this reason, the BBC had to circumvent some of its own decision-making procedures, such as the need to submit a formal business case to its Executive Committee, in order to submit an application in time);
- With only four weeks to prepare their submissions, the applicants were more concise in their proposals (it is also possible, although this has not been confirmed, that the ITC was less demanding second time around in terms of the number of sensitivity tests that the applicants' business plans were subjected to and applicants offered fewer licence permutations);
- The ITC set-up six teams to work on the evaluations, one for each of the criteria, and brought in external advisers to supplement its own resources.

During the lengthier 1997/98 evaluation round, considerable effort was put into assessing the reasonableness of the applicants' assumptions underpinning what were two very different proposals. Although they both had adopted a pay-TV model, DTN offered what may be regarded as a more adventurous approach including various data services, new programme channels (including a proposed British Sports Channel) and a low entry price. There were no Sky channels in its programme line-up. While there is no public record of how the two applicants fared against the various criteria, some insight is provided by the ITC's announcement that BDB had been successful. With regard to the ability to establish and maintain the service it said:

The ITC considered that BDB's application offered a greater degree of assurance than that of DTN that the proposed service could be established and maintained throughout the period of the licences.

With regard to the programme proposals appealing to a variety of tastes, the ITC said:

Each applicant put forward acceptable proposals for appealing to a variety of tastes and interests but of a different character. ...On balance the ITC was more attracted by the innovative programme proposals (supported by additional services) designed to appeal principally to a wide range of different audiences which were put forward by DTN.

With regard to promoting the acquisition of DTT equipment, the ITC said:

Each applicant proposed substantial expenditure on the promotion of DTTV, both in respect of the subsidy of domestic receiving equipment and in advertising and

marketing costs. Although DTN proposed a higher level of expenditure on receiving equipment than BDB, this expenditure was dependant on a more optimistic estimate of subscriber numbers.

On balance, it is fair to assume that the ITC opted for the less risky of the two applicants. As the ITC said in its announcement:

The ITC's conclusion was that, on the basis of each applicant's business plan and funding proposals and the further information supplied by each applicant, there would be a higher degree of confidence in the ability of BDB to establish and maintain its services throughout the licence period.

Funding for BDB was to come from the internal resources of its owners, Carlton and Granada. DTN, on the other hand was reliant on its parent company, Cabletel (which subsequently became ntl), raising further debt. The latter had already raised substantial debt finance to fund its cable investments and would have been considered a high-risk option.

Turning to the 2002 evaluation, it would appear that the applicants were broadly similar on many of the criteria. However, according to the ITC's press release at the time, the decision was based on the following factors:

- the opportunity provided by the (BBC/Crown Castle) consortium for a fresh start for DTT by offering a distinctive new proposition to consumers;
- the consortium's top-level resolve to launching and sustaining a service for the duration of the licence;
- their approach to addressing technical issues required to improve the performance of the platform;
- the ambitious and clearly developed marketing strategy for the whole DTT platform;
- the combination within the consortium of management strength-in-depth of its members and their ability and commitment to deliver the stated proposition and hence promote digital terrestrial television in the UK overall.

This formal statement tends to concur with an interviewee's view that not only was financial viability uppermost in people's minds in the wake of ITV Digital's collapse but the vision expressed by the BBC's Director General, Greg Dyke was a persuasive factor.

The ITC's press release also commented on a special feature of the Consortium's application, which was the proposed establishment of a marketing company, "ServicesCo" (since named Digital Television Services Limited) - comprising the BBC, Crown Castle and BSkyB. Also, the BBC and Crown Castle have undertaken to offer participation to other multiplex operators so that the DTT platform can be marketed as a whole.

In awarding the licences, the ITC imposed certain conditions to address competition concerns:

- Crown Castle was required to sub-license channel supply on Mux C and Mux D on fair, reasonable and non-discriminatory terms. (Should the BBC choose to sub-license capacity, the same would apply.)
- BSkyB was permitted to supply the three channels named in the application on Mux C but not manage a multiplex.
- to maintain range and diversity, changes in channel line-up would need agreement from the ITC, as would any proposal to introduce pay services.
- all technical aspects of the transmission roll-out and receiver specification were to be handled through The Digital Network (TDN) - or its successor - to ensure all-industry participation. There would be a non discriminatory requirement for kite marking boxes and it will be clear that technical specifications should not be used to achieve gateway control.
- the ITC required the listings information which informs the Electronic Programme Guide (EPG) to conform to open technical standards. This would enable TV manufacturers to design their own presentation of programme listings.

4.4 Licence Fees and Other Payments

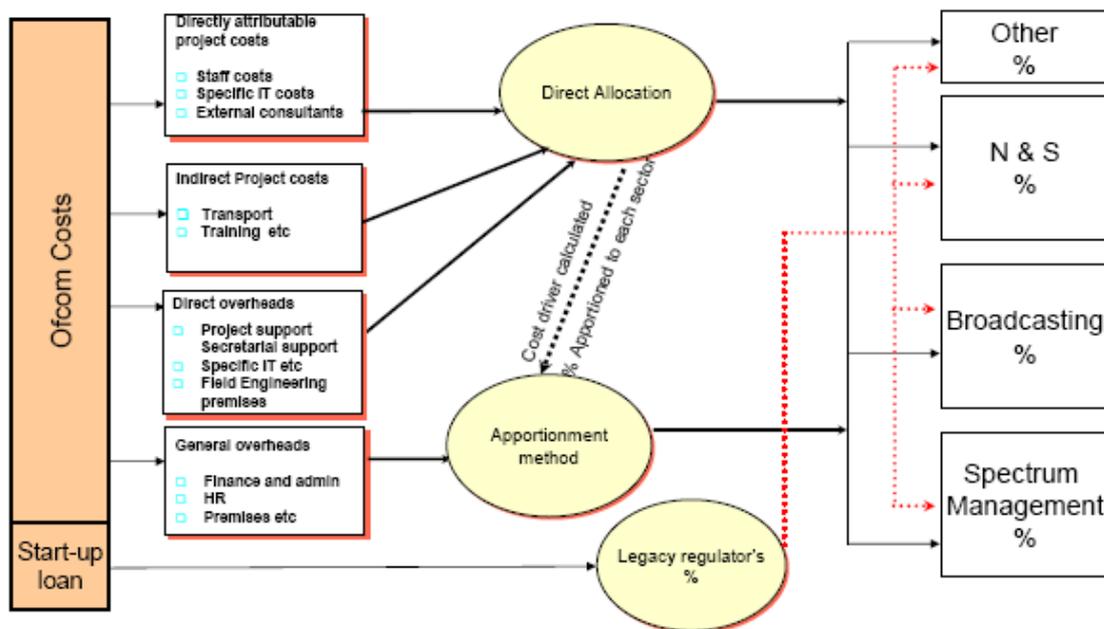
There are two main types of payment associated with the multiplex licence: licence fees and spectrum-related or "additional" payments.

4.4.1 Licence Fees

Ofcom endeavours to recover the costs incurred in carrying out its regulatory duties, as defined in the 2003 Act, by levying administrative fees on providers of designated electronic communications networks and services and by levying licence fees on broadcasters. Following

principles that are set out in its Statement of Charging Principles²⁰, Ofcom allocates its costs to a number of regulatory sectors, as illustrated in the diagram below.

Figure 11 Basis on which Ofcom allocates its costs for licence fee determination



Source: Ofcom, *Statement of Charging Principles*, February 2005

Within the broadcasting sector, Ofcom has both radio and television groups, and the latter includes five categories, as summarised in Table 3 below (the DTT-related licences are emboldened). For 2007/08, the television sector is forecast to account for 19 percent of Ofcom’s planned costs, i.e. £27m (€39 million).

Table 3 Television categories used for Ofcom licence fees (DTT-related licences are shown in bold)

Category	Constituents
A	Channel 3, Channel 4, Channel 5 and the Public Teletext Service Licence (Note that this category includes relevant turnover associated with Television Licensable Content Service (“TLCS”) licences for the PSB channels where content is simulcast)
B	Television Licensable Content Service Licences (TLCS), Digital Television Programme Service Licences , Commercial Additional Services Licences and Digital Additional Service Licences (Note that this category does not include those TLCS licences for PSB channels which are included in Category A)
C	Restricted Television Service Licences (long-term and short-term)
D	Multiplex licences
E	Tele-shopping channels

²⁰ *Statement of Charging Principles*, Ofcom, February 2005
http://www.ofcom.org.uk/consult/condocs/socp/statement/charging_principles.pdf

Within categories A and B, the annual licence fee is based on a percentage of relevant turnover; turnover having been chosen as a reasonable indicator of ability to pay and a fairly readily available piece of data to obtain. Relevant turnover in this instance is represented by the revenues (exclusive of value added tax) in respect of each relevant calendar year derived from the provision of that Licensed Service. Broadly speaking, it includes revenue from advertising, sponsorship and subscription fees. Where revenue is earned from broadcasts that are common to two or more platforms (i.e. different licensed services) then it is apportioned to each licence according to the number of homes that receive the broadcasts exclusively from that platform. Note that the PSB channels that are simulcast on DTT, and covered by Digital Replacement Licences, are charged at a special Category B rate that is effectively the same as the Category A rate (see table below).

For categories C, D and E, the licence fee is not based on a percentage of revenue. The 2007/08 tariffs for the various DTT licences are summarised in the tables below.

Figure 12 Ofcom's 2007/08 Licence Fee Tariff for Categories A and B

Relevant Turnover	Category A PSB Revenues	Category B PSB Simulcast Revenues	Category B Non-PSB Revenues
Bands			
£0m - £10m	0.23603%	0.23603%	0.04324%
£10m - £35m	0.35405%	0.35405%	0.08659%
£35m - £75m	0.53107%	0.53107%	0.17317%
£75m - £300m	0.79660%	0.79660%	0.34635%
Over £300m	0.0%	0.0%	0.0%

Notes:

- i) Minimum Fee = £1,000
- ii) Rates are expressed cumulatively, e.g. for Category A licensees 0.23603% is charged on the first £10m of Relevant Turnover;
 - 0.35405% on the next £25m;
 - 0.53107% on the next £40m and
 - 0.79660% on the next £225m.

Source: *Ofcom's Tariff Tables 2007/08*²¹

Figure 13 Ofcom's 2007/08 Licence Fee Tariff for Category D

	Tariff for 2007/08 (£)
Digital Multiplex	
Fee per annum	10,000
Application / Renewal fee	25,000

Source: *Ofcom's Tariff Tables 2007/08*

²¹ <http://www.ofcom.org.uk/about/account/tarifftable0708/tariffs0708.pdf>

Two significant changes were introduced in the 2005 charging principles with regard to the definition of relevant revenue. First, a notional 30 percent deduction is now allowed on subscription revenues, including pay-per-view revenues, where the licensee is also the retailer of the service so that the licence fee is based effectively on the wholesale price (in common with channel providers who retail their services through a third-party).

Secondly, the definition of revenue derived from interactive services has been refined. This includes income derived from both stand-alone interactive services and services that are an integral part of a programme service and regardless of whether the interactive response was made via the set-top box (hence, revenue derived from including a premium-rate telephone number in a licensed service would be included). A number of allowances are made when determining how much revenue to include in the licence fee calculation. The main ones are, in brief:

- revenue generated by associated retail activities (e.g. home shopping) are not included;
- under revenue-sharing arrangements where a proportion of revenue is retained by a third-party and never reaches the licensee, only the net revenue is relevant;
- revenue received other than in the capacity of an Ofcom licensee or provider of licensed services is ignored;
- agency commission charged on interactive advertisements may be discarded, up to a specified amount;
- money paid out in winnings as part of a betting or gaming service may be netted off.

4.4.2 Spectrum-related Fees - "Additional Payments" and AIP

Typically, commercial broadcast licences in the UK that utilise spectrum are liable to some form of payment to government. In the case of terrestrial broadcasters, this is known as an Additional Payment and consists of two elements: a fixed annual sum and a percentage of the revenue earned from advertising and sponsorship. Prior to DTT, when a licence was being awarded through competitive tender, the applicants would compete for the licence by bidding on the fixed sum (the percentage of revenue would have already been determined by the regulator). Subsequently, when a licence was renewed, the regulator was required to set both the fixed sum and the percentage as if it were being advertised.

In the case of DTT, for the first 12 year term of the multiplex licence, it was decided by government that no additional payments should be made on the grounds that to do so would be a deterrent to investment in digital terrestrial broadcasting. However, the possibility remains within the current legislative framework for payments to be collected during the renewed licence period based on a percentage of revenue.

Similarly, although the commercial PSB broadcasters make additional payments to government in recognition of the spectrum used for their analogue terrestrial transmissions, no charge is levied in connection with their DTT transmissions. The argument advanced by Ofcom is slightly different from that used in the context of the multiplex licences, in that it is based on the fact that multiplex capacity could be obtained in the marketplace and, therefore, cannot be regarded as scarce in quite the same way. It is worth noting in passing that, in order to arrive at the so-called Analogue Qualifying Revenue that forms the basis of the (analogue) additional payment, advertising and sponsorship revenue obtained by jointly selling across both the analogue and digital simulcast services is apportioned according to the proportion of homes that rely exclusively on analogue terrestrial and analogue cable transmissions.

In 2006, Ofcom announced a new scheme that would provide clear incentives for the efficient use of the radio spectrum used by terrestrial television and radio broadcasters. It is due to be introduced in 2014 and digital terrestrial radio and television broadcasters will be required to pay an annual fee – known as Administered Incentive Pricing (AIP) – that reflects the amount of spectrum they use. This follows an Ofcom consultation, published in July 2006²², on proposals to introduce AIP for spectrum used for terrestrial broadcasting.

The introduction of AIP for spectrum used for terrestrial broadcasting will bring television and radio in line with other spectrum users. The application of AIP is one way to encourage spectrum users to make efficient use of their frequencies, or to release the spectrum to others who can make better use of it.

²² <http://www.ofcom.org.uk/consult/condocs/futurepricing/futurepricing.pdf>

Specifically, AIP will be levied on all DTT multiplex operators (BBC, ITV & Channel 4, SDN and National Grid Wireless), as well as digital national radio broadcasters and digital local radio broadcastings.

Ofcom will consult on the details of the fees to be applied to digital terrestrial television and radio broadcasting from 2014 nearer the time of introduction, although it has already indicated that it does not expect the charges to be large in comparison to the broadcasters' other costs.

4.5 Technical Considerations

Ofcom's policy on technical standards and, before it, the ITC's rests on the principle of open standards so that multiplex operators are not able to lock-in customers or channel providers into its own proprietary standards. In doing so, they do not wish to stifle market innovation or variety. On this basis, several generic requirements were issued by specifying:

- which variant of DVB-T;
- which MPEG 2 profile; and
- the need for commercial multiplexes to cross-carry the Service Information from all other services.

The launch of Freeview in 2002, unencumbered by any need for a conditional access system to support a pay-TV offering, has arguably allowed the STB market to flourish, free of proprietary influences. Manufacturers felt confident to enter the market and the typical price of a STB, as explained previously, fell substantially and rapidly.

This relatively smooth development path is perhaps now being tested, however, by BSkyB's initial proposal to launch a pay-TV service that could conceivably be based on MPEG4 compression (rather than the current MPEG 2) – although BSkyB has since withdrawn this suggestion. Nevertheless, the danger that the DTT viewer population could become fragmented remains and will, no doubt, be one of the issues considered by Ofcom in its review of the BSkyB proposal.

4.6 Realisation of Policy Objectives

Most apparent from the above description of the regulatory framework is the need for it to evolve in response to two factors. The first is that, when setting out, the UK was very much at the forefront of introducing DTT. There were clear first mover disadvantages such as:

- having to err on the side of caution in the original transmission planning due to a lack of large-scale real-life experience; and
- being bound in, through the installed population of nearly 20 million DTT STBs, to standard definition, MPEG2 code etc makes it more difficult to accommodate new developments such as DVB2, MPEG4 and high definition.

The second factor is that, when the framework was first established, digital switchover (DSO) was too far off to be fully accommodated. As the policy for DSO has become firmer, so licences have been amended in order to bind licensees into a common vision for its implementation.

Other areas where hindsight suggests a different approach would have been preferable include:

- putting more emphasis on the core coverage achievable by all multiplexes, and not on individual multiplexes. This is a complex subject, making it all the more important to focus on having simple messages to ensure effective communication with policy makers, consumers etc.
- aiming for the same approach to standards, coding etc across all multiplexes so there is a straightforward customer proposition (perhaps with an obligation on multiplex licensees to collaborate on establishing a common approach).

That said, there are some clear successes in terms of the framework, including:

- creating the two-tier system with separate programme channel and multiplex licences. This has helped to provide flexibility by (i) introducing fluidity to prevent, say, PSB broadcaster simply generating identical themes across multiple channels (ii) encouraging a wider range of services and (iii) facilitating PSB involvement – an essential part of the policy goal to create a "mixed" economy;
- using codes (for transmission etc) rather than putting everything in licences.

5 Switch-off Strategy

The focus over the last five years or so in the UK has been on achieving digital switchover (DSO). This chapter provides an overview of the switchover strategy, details of the plans that have been put in place to implement switchover, an outline of the key concerns affecting consumers and the provisions being made to address these concerns and a concluding assessment.

5.1 Strategy Overview

In September 1999, the then Secretary of State for Culture, Media and Sport (Chris Smith) said that digital switchover (DSO) could start as early as 2006 and be completed by 2010, subject to three conditions being met:

- everyone who was currently receiving the PSB channels in analogue must be able to receive them in digital form;
- switching to digital must be affordable for the vast majority of people; and
- the majority (considered initially to be 95 percent) of consumers should have access to DTV.

Realisation of these conditions was, he said, dependent on how broadcasters, manufacturers and consumers behaved over the coming seven years. It is important to note that, at this stage, that these ambitions were platform-neutral.

These views were crystallised in a 2001 White Paper²³, which identified the following key preparatory activities:

- bring together various stakeholders to develop a digital TV action plan;
- launch a series of digital TV projects that would allow involved communities the opportunity to influence future shape of digital TV;
- work with broadcasters to promote public understanding of the benefits of digital TV; and
- work with industry to ensure clearer and more informative labelling of digital TV services and equipment.

Work began very soon afterwards on the Digital TV Action Plan, bringing together government, broadcasters, manufacturers, retailers and consumers and the first plan was published in January 2002.

It was widely believed, however, that the slow take-up of DTT was insufficient, and the cost of extending digital coverage too high, to achieve the three stipulated conditions for DSO within the 2006-2010 timeframe. Uncertainty was fuelled by the financial difficulties and subsequent bankruptcy of ITV Digital in April of that year.

Digital switchover and the success of DTT were increasingly seen as inextricably linked. Not only was a firm government commitment to analogue switch-off seen as an important ingredient in the marketing of DTT but, technically, DTT coverage to around 27 percent of UK homes could only be achieved once the analogue frequencies were switched off. Something of a stand-off developed between broadcasters and government over the need for a firm commitment.

Early findings from a cost-benefit analysis carried out by government officials and growing acceptance of the fact that the three conditions could not be achieved without DSO (a view that was endorsed by consumer research) meant that, in September 2003, the new Secretary of State for Culture, Media and Sport, Tessa Jowell, was able to announce that it was no longer a question of whether DSO would happen but how and when. The results of this initial cost-benefit analysis showed quantifiable benefits, in terms of net present value, in the region of £1.5 to 2.0 billion (€2.2 to 2.9 billion).

In April 2004, Ofcom and the BBC each published a progress report on DSO voicing concerns that the market alone, under the commercial and policy environment as it stood at the time, would not deliver 95 percent coverage by 2010. In the following month, the government's Culture Secretary made a Written Statement to Parliament saying that, whilst switchover by 2010 remained attainable, more concerted effort was required by the broadcasters, manufacturers and retailers if the full benefits of digital television were to be realised within the timescale.

²³ *Opportunity for all in a world of change*, Department for Trade & Industry, February 2001.

The government invited the various players to work more closely with it and the newly-converged regulator, Ofcom, to develop an achievable timeframe and make DSO a reality. Arising from this collaboration was a number of steps that are seen as vital to the implementation of DSO:

- the BBC commitment to DSO;
- amendments to the PSB multiplex licences, incorporating commitments to replicate analogue coverage (98.5 percent of TV households) on the DTT and a back-stop date of 2012 for completing DSO (as discussed in the previous chapter with regard to the Digital Replacement Licences and DSO licence amendments);
- the creation of an industry-led partnership of broadcasters and multiplex operators in the form of SwitchCo, since renamed Digital UK (DUK), which has gone on to be the focus for driving forward DSO.

In the run up to the renewal of its Charter, the BBC explained how it could take a leading and coordinating role in the building of a digital Britain²⁴. This included the following commitments:

- to commit to a full roll-out of DTT with target DSO of 2012;
- to work with other stakeholders to find ways of funding and coordinating DTT roll-out for all PSB;
- to lead and part-fund large-scale marketing to support DSO;
- to take special responsibility for attracting non-adopters;
- to work with others to create free DSAT service, offering a broader range of channels and interactivity than DTT could currently support, and able to reach households outside DTT coverage.

Many of these proposals were subsequently taken up by government and incorporated into the BBC Charter, which was due for renewal in 2006. In the Charter Review Green Paper²⁵, the government identified an additional public purpose for the BBC: building digital Britain. This meant playing an active part in the industry-wide partnership, leading on the public information campaign and helping to establish and fund schemes to help the most vulnerable customers make the switch to digital. This latter responsibility is managed, on a day-to-day basis by a BBC subsidiary called DSHS Limited. Further details appear below.

Similarly, Ofcom launched a review of the DTT licences held by the PSB broadcasters in July 2006 and, in December that year, announced a series of switchover-related changes (described in the previous chapter).

5.2 Implementation

In response to the government's wish to see an industry-led coalition implement digital switch-over, the PSB broadcasters decided to create a separate organisation that would operate independently of government and the broadcast companies on a day-to-day basis. Digital UK (DUK) was formed as a company, limited by guarantee, in April 2005 and is at the very centre of implementing digital switchover.

Its mission is:

to create the conditions for all the UK's analogue terrestrial TV transmissions to cease by the end of 2012, in a way that makes it a positive and simple experience for consumers.

The PSB broadcasters (the BBC, Channels 3 and 4, Five, S4C and Teletext), along with the multiplex operators National Grid Wireless and SDN, are shareholders, with the BBC holding 56 percent of the shares. Given its greater financial contribution, the BBC has two votes on the board with other shareholders having one each.

There was considerable discussion at the outset on whether the supply chain companies should also be shareholders in DUK but it was ultimately decided that they would instead have observer status on the board (without any voting rights). However, it has been a priority within DUK to ensure that manufacturers, retailers and other links in the supply chain have been involved from the outset in all key decisions. This is reflected in DUK's three main stated objectives, namely to:

²⁴ *Building Public Value*, BBC, June 2004

http://www.bbc.co.uk/foi/docs/bbc_constitution/bbc_royal_charter_and_agreement/Building_Public_Value.pdf

²⁵ *A Strong BBC, Independent of Government*, DCMS, March 2005

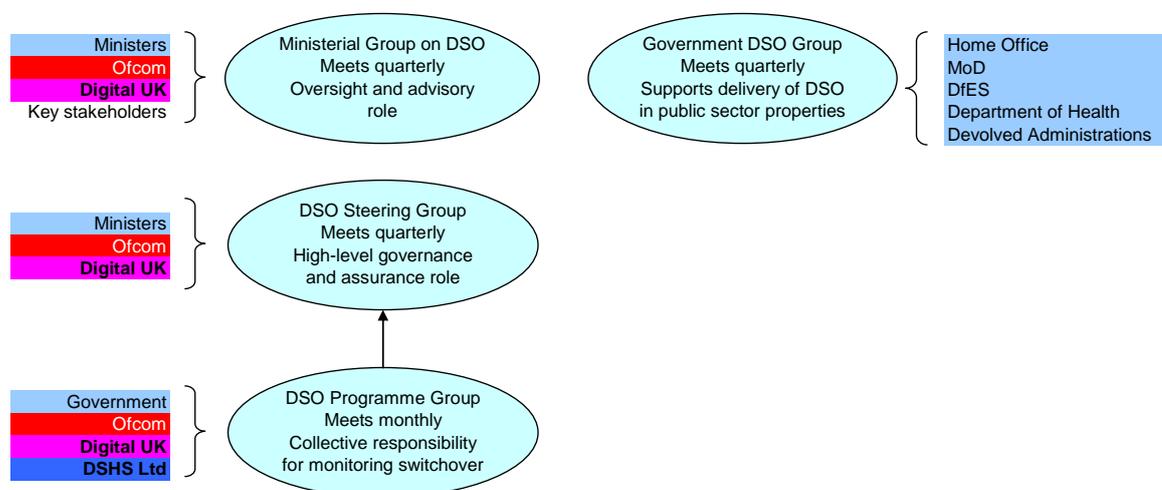
http://www.bbccharterreview.org.uk/have_your_say/green_paper/bbc_cr_greenpaper.pdf

- coordinate the technical rollout of the DTT network;
- communicate with the public about DSO; and
- liaise with stakeholders (manufacturers, retailers, aerial installers etc) to ensure understanding of and support for the switchover programme.

To reinforce its independence, the DUK's chief executive was appointed from outside the broadcasting industry and it has a permanent staff of just under 40 people (although this includes a number of people who were brought in from the broadcast organisations).

Following the creation of DUK, government and regulatory involvement is now realised through a series of working groups, as illustrated in the diagram below. At the centre of this structure is the Programme Group, which brings together representatives from the two sponsoring government departments (DCMS and Department for BERR), Ofcom and DUK. This group is collectively responsible for monitoring the implementation of digital switchover; that is to say, no one organisation can legally direct what should happen with regard to switchover. In the event of an impasse being reached, issues can be referred to the Steering Group although, in the two years' it has been operating, this has not been necessary.

Working Groups Coordinating the DSO Programme



As the diagram shows, Ofcom has a presence at all levels within the hierarchy and has a coordinator who works closely with the overall project coordinator. Its role in the DSO programme has been described with reference to two phases:

- between 2003 and 2006, it was responsible for expanding and refining the policy set out by government;
- from the beginning of 2007, Ofcom's role has become more of an observer/problem-solver and, if need be, enforcer.

Although Ofcom has no executive powers within DUK, it has the necessary influence through its regulatory powers should intervention be necessary.

The responsibilities of the work groups and a description of the overall work programme is contained in a joint publication entitled: *Digital Work Programme*²⁶. The document also describes the nine main work-streams:

- communications;
- consumer and market research;
- consumer & public affairs;
- broadcast infrastructure;
- housing and property;
- digital equipment;
- digital switchover help scheme;
- Ofcom regulatory;
- government regulatory and statutory.

²⁶ <http://www.digitaluk.co.uk/en/industry-support/resources/01/file/Programme%20Structure%20version%202.pdf>

The DUK's work is informed by regularly-updated market and consumer research, much of which is published in its quarterly tracker surveys.

Funding for the DUK's operational costs comes from its shareholders. In addition, the BBC will manage delivery of the Help Scheme and, through the licence fee, provide £200 million (€290 million) to fund DUK's public communications campaign and £600 million (€870 million) to finance a help-scheme for the elderly and disabled.

Shadowing the DUK's board is the Platform Advisory Group, which includes representatives from BSkyB and Virgin Media. Under the European Commission's rules for state-aid, it is necessary that the funded activities are platform neutral; this extends to the messages communicated by DUK as well as specific help schemes.

Switchover will be phased over five years or so by ITV region and is due to start in 2008, although the first analogue switch-off in the UK will occur in October 2007 at Whitehaven in Cumbria, where a pilot project has been running for several months.

5.3 Consumer Viewpoint

Extensive consultation has been carried out with various consumer groups. The Department for Trade and Industry commissioned a series of consumer research studies in 2003 to explore consumers' attitudes to digital television and switchover. The main findings of the studies (which included questionnaires, focus groups, usability audits and hands-on trials of equipment) were as follows:

- people's views about DTV were influenced as much about the quality of the programming available as the practical considerations regarding equipments costs, ease of use;
- people made a distinction between their attitudes towards DTV and DSO. Those with enthusiasm for, or an open mind towards, the former may be opposed to analogue switch-off;
- announcing a switchover timetable would change people's attitudes towards DTV and have a major impact on their purchasing decisions;
- successful switchover requires people to be fully informed, fully engaged and confident in their choices.
- barriers remained in the use of EPGs, the complexity of introducing more audiovisual equipment in the home;
- an estimated 2m people would be unable to use a STB for simple TV viewing;
- 700,000 people would be unable to use digital text and interactive services;
- nearly 50 percent of those aged 75 and over would have great difficulty buying, installing and using a STB without assistance.

Other concerns, identified by the [DTV consumer expert group], focused on the cost of DTV equipment and the lack of coverage in nearly a third of the country. The group recommended that:

- assistance should be provided to low-income households;
- a free-to-view satellite service, which would give all homes the option to switch to digital before DSO, should be developed;
- a public information campaign should be launched about switch-off and the transition process; and
- features and potential benefits of DTV should be accessible to all consumers, including the disabled and elderly.

Ofcom's Consumer Panel, taking account of the above findings, recommended in its November 2004 report that emphasis should be placed on helping those consumers who were socially isolated and who would therefore have most difficulty in finding out about switchover and knowing what steps to take. Financial barriers, though recognised, were considered to be of secondary importance compared to the need for practical support.

Out of this work stemmed a help-scheme targeted at the elderly and disabled. This, along with two other focal points for particular assistance, is described in the next section.

5.4 Assistance for special (consumer) groups

Three groups within society have been identified for particular attention:

- a target help scheme for the elderly and disabled;
- an outreach programme to provide support to other people that are isolated in the community; and

- residents in apartment blocks and multi-tenanted housing, along with hospitals, prisons etc, where television signals tend to be distribution by a local CATV system.

Help Scheme

In September 2005, the government announced a help scheme that would be targeted at those people who, according to the advice of the government-appointed Consumer Expert Group and various research commissioned by government departments, are the least likely to have digital television and the most likely to experience difficulty installing equipment. To be eligible for support, the person must satisfy at least one of three criteria:

- aged 75 or more;
- have a severe disability and be in receipt of a state disability or attendance allowance; or
- be registered blind or partially sighted.

It is estimated that under these criteria, which must apply within an eight month period prior to switch-off of the final analogue transmission in the person's region, around 7 million people (i.e. over 10 percent of the population) would qualify for support.

Support consists of the following main components:

- provision of a digital receiver for one television;
- installation of receiver and, if necessary, aerial;
- support on using the equipment.

The support will be provided free of charge to the person if he or she is in receipt of income support, job seeker's allowance or pension credit. If not, they will be required to contribute towards the cost.

The details of the scheme were formalised in the Digital Switchover Help Scheme (DSHS) Agreement, which was published by the DCMS in May 2007. Under the agreement, the BBC is responsible for ensuring that the assistance provided complies with the DSHS. A BBC subsidiary, DSHS Limited, has been established to oversee the scheme, although the provision of assistance will be contracted out to one or more third parties.

A company (Capita) has already been awarded the contract to run the scheme in the pilot project in Whitehaven. The successful tenderer for the UK-wide scheme is expected to be announced later this year or early 2008.

It is estimated that the scheme will cost £603 million (€874 million) over a six year period and it has been agreed between the government and the BBC that this amount will be ring-fenced from the BBC's television licence fee income.

In order to help identify persons eligible for the help scheme, it has been necessary to put legislation through Parliament - the Digital Switchover (Disclosure of Information) Act - to allow the release of information held by the Department of Work and Pensions to the contractor. They will then communicate directly with people, inviting them to participate in the help-scheme. It is expected that not all qualifying homes will request assistance and that the average cost per household will be in the range of £100 to £150 (€145 to €217).

Outreach Programme

This is still in the early stages of development, but DUK is seeking to establish a partnership with the voluntary sector to integrate DSO support into existing community outreach and care/home visit programmes. To facilitate this initiative, DUK has been recruiting regional managers who will develop links with relevant organisations in the local community as well as lead local, face-to-face communications exercises.

CATV Users

Around one in five people in the UK live in an apartment or other multi-user dwelling, and rely on some form community aerial television (CATV) system for access to television broadcasts. Research carried out by the Digital Television Group indicated that the majority of CATV systems would require some attention before delivering DTT.

Subsequent research carried out for the DCMS showed that, whilst steps were being taken to prepare for DSO, further intervention was required. In response, the government set up a Housing Sector Communications Group to work with industry representatives including DTG, the standards body for digital television. Guidance was published in the summer of 2005 and the DUK has put in place an information support programme targeted specifically at landlords, housing groups etc. The Government Switchover Group also brings together representatives

from the Health Service, Schools, Ministry of Defence etc to coordinate preparation within public sector properties that have TV installations.

5.5 Assessment

The task of digital switchover is clearly multifaceted with many stakeholder groups and several substantive work-streams running in parallel. This has warranted a complex organisational and work-related structure would appear to be working. It is understood that this view is supported by independent assessments undertaken by the National Audit Office and the Office of Government Commerce (a part of the Treasury).

It has also been necessary for communications objectives to evolve; for example, some of the early "high-level" messages (more channels, fairer access to DTT across the country and the development of UK's industry) were found to not be resonating with consumers and so the emphasis was changed.

In hindsight, the main lesson has perhaps been the need to shift the focus of the communications plan to have more emphasis on localised, face-to-face information dissemination (road shows, events, charity link ups). In support of this, DUK has been recruiting more regional managers to provide a local focus. They will work closely with local charities, voluntary groups and care schemes as part of their outreach programme.

DUK is soon to face its first big public relations challenge, which is the consumer and media reaction to the imminent switch-off of analogue transmissions in Whitehaven.

Thereafter, the focus is likely to shift to whether the help scheme is successful. Any scheme that involves providing assistance in the home is potentially high risk. There is the danger that vulnerable people will be prone to bogus callers, with all the inherent problems that that poses. And there will inevitably be difficulties in coordinating and arranging access to people's homes, with implications for the costs of implementing the scheme.

The over-riding conclusion, however, is that it is possible to establish an implementation framework in which industry can work collaboratively to achieve a shared goal. The model established by DUK – an independent organisation with clearly stated objectives, making decisions on a consensual basis, informed by market and consumer research, and working closely with the supply chain – is one that is being taken up in other countries. Such an industry-led approach, however, is only likely to succeed in appropriate conditions. In the case of the UK, this has meant obtaining coverage commitments from the broadcasters and multiplex operators (incorporated into their licences) and to have the ability to continue to apply leverage via their licences.

It is argued that DSO would not happen if there was not a substantive benefit in the shape of the so-called digital dividend. The clearance of 14 channels in the UK is now a stated goal of DSO for government. As part of the government's published cost-benefit analysis for DSO in 2005²⁷, the consumer benefit of the released spectrum was estimated to be around £1.0 billion (€1.45 billion). This was a significant contributor to the overall net benefit of £1.7 billion (€2.5 billion) but not, it has been suggested, sufficient to provide a compelling case for switchover. In subsequent work carried out by Ofcom²⁸, the consumer benefit²⁹ of the spectrum is put substantially higher at £5 to 10 billion (€7 to 14 billion) and the case becomes that much stronger.

²⁷ *Regulatory and Environmental Impact Assessment: the timing of digital switchover*, DCMS and DTI, September 2005 http://www.digitaltelevision.gov.uk/pdf_documents/consultations/ria_timingof_ds2.pdf

²⁸ *Digital Dividend Review – Consultation*, Ofcom, December 2006
<http://www.ofcom.org.uk/consult/condocs/ddr/ddrmain.pdf>

²⁹ The value of spectrum is based, not on estimated proceeds from auctions, which has proved notoriously difficult, but from the estimated benefits to consumers and businesses from having access to the spectrum for new services and applications

Acronyms

AIP	Administered Incentive Pricing
BDB	British Digital Broadcasting
C&AG	Comptroller & Auditor General
CATV	Communal Aerial Television
DAS	Digital Additional Service
DPS	Digital Programme Service
DRL	Digital Replacement Licence
DSHS	Digital Switchover Help Scheme
DSO	Digital Switch-over
DTAS	Digital Television Additional Service
DTPS	Digital Television Programme Service
DTSL	Digital Television Service Licence
DTT	Digital Terrestrial Television
DUK	Digital UK Ltd
EPG	Electronic Programme Guide
IPTV	Internet Protocol Television
ITC	Independent Television Commission
Mux	Multiplexer
PSB	Public Sector Broadcasting
PVR	Personal Video Recorder
STB	Set Top Box

Annex 1: Summary of Key Players

Organisation	Licence(s) held / Role	Owners	Comments
Arqiva	Terrestrial transmission network operator		Previously part of ntl. Acquired by Macquarie Communications in 2004
BBC	PSB broadcaster Operator of Mux 1	Public corporation funded by licence fee	
BBC Free-to-View Ltd	Operator of Mux B since 2002	BBC	
BDB	Successful applicant for Mux B, C and D in 1997	Carlton, Granada and BSkyB	Re-branded as ONdigital in 1998
Channel 4	PSB broadcaster	Public corporation funding by advertising	
The Consortium	Successful joint applicant for Mux B, C and D in 2002	BBC and Crown Castle	
Crown Castle	Terrestrial transmission network operator; Operator of Mux C and D since 2002; and Partner in The Consortium		Acquired by National Grid Wireless
Digital 3 & 4 Ltd	Operator of Mux 2	ITV and Channel 4	
Digital UK Ltd	Consortium responsible for implementing DSO	BBC, ITV, Channel 4, five, SDN, Crown Castle	
DTHS Ltd	Responsible for managing DSO help scheme	BBC	
DTV Services Limited	Marketing joint venture for Freeview (DTT service provided by the Consortium)	BBC, Crown Castle and BSkyB	
five	PSB broadcaster		
ITC	Regulator for commercial broadcasting until 2003		
ITV	PSB broadcaster	Quoted company	
ITV Digital	Operator of Mux B, C and D 2001-2002	ITV (created by merger of Carlton and Granada)	Successor to ONdigital
Ofcom	Regulator for broadcasting and communication sectors since 2003		Successor to ITC and other sector-specific regulators

Organisation	Licence(s) held / Role	Owners	Comments
ONDigital	Operator of Mux B, C and D 1998-2001	Carlton and Granada	Successor to BDB Re-branded as ITV Digital in 2001
S4C	PSB broadcaster for Wales	Public corporation funded by govt grant, advertising and BBC programming	
SDN Ltd	Operator of Mux A	S4C, ntl and United News & Media,	Acquired by ITV in 2005
SwitchCo	Working title for consortium formed to implement DSO	PSB broadcasters	Incorporated as Digital UK
Teletext Ltd	PSB teletext service provider		
Top-Up TV		PSB broadcaster, five (20%) and USA holdings company, Access	

Annex 2: Detailed Chronology of DTT in the UK

August 1995	Publication of the White Paper, 'Digital Terrestrial Broadcasting: The Governments Proposals'. The paper outlined the policy objectives and regulatory framework under which DTT in the UK was to be launched.
July 1996	The proposals put forward in the 1995 White Paper became legislation in the 1996 Broadcasting Act.
October 1996	ITC invited applications for multiplex licences with a deadline of January 1997. Applications were received from Digital Television Network (DTN) and British Digital Broadcasting (BDB).
31 Jan 1997	Deadline for submission of applications to the ITC for the three commercial multiplexes (B, C and D) and the 50% available capacity on Mux A.
1997	Chester Conference amended the spectrum planning agreements of the 1961 Stockholm Conference plan to allow interleaving of digital signals within existing analogue TV frequencies and set down principles for analogue conversion.
December 1997	BDB were granted three licences to broadcast DTT. The ITC also licensed one multiplex to Digital 3&4 and one to SDN.
October 1998	BSkyB launched its own digital satellite television service.
November 1998	BDB, re-branded as ONdigital, launched its service, becoming the world's first DTT commercial broadcaster. ONdigital offered a number of free to view channels and a subscription based service.
June 1999	Sky and ONdigital began to provide free set top boxes for a limited time. This move increased the rate of take up for both digital platforms.
September 1999	Labour Government set criteria for analogue switch-off aimed for 2006-2010.
November 1999	ONdigital launched pre-paid digital set top boxes.

May 2000	First digital terrestrial pay for view movie
December 2000	Publication of the White Paper 'A New Future for Communications' which contained the Government's proposed vision for communications regulation and it outlined a commitment to digital switchover.
February 2001	Publication of the White Paper 'Opportunity for all in a world of change' which contained a strategy for enabling the UK to become the most dynamic and competitive market for Digital TV. This included bringing together stakeholders to create a digital TV action plan and promoting public understanding of Digital TV.
April 2001	Tesco.com links with ONdigital to provide the world's largest online grocery service.
July 2001	ONdigital re-branded as ITV Digital but was making increasing losses.
September 2001	BSkyB switched off its analogue satellite transmissions
January 2002	Publication of the joint Government-Industry 'Digital Television Action Plan'.
March 2002	ITV Digital went into administration
April 2002	ITV Digital was closed down
May 2002	ITC invited applications to occupy the three multiplex licences which had become vacant due to ITV Digital's demise. The deadline for applications was June 2002.
June 2002	The technical trial, the Go Digital Project, took place, organised by industry, government and ITC. Involved 300 homes in Sutton Coldfield area. Before the trial around 20% said not interested in digital. After the trial, 68% of this group said they would convert. Only 6% still had no interest at all. A preliminary technical trial was in 2001.
June 2002	Six applications are received for the vacant multiplex licences

June 2002	The European Union's 'e-Europe 2005 Action Plan' was launched. It called for all Member States to submit their plans for digital switchover by the end of 2003.
July 2002	ITC awarded three multiplexes to the BBC/Crown Castle consortium
October 2002	The BBC/ Crown Castle consortium, re-branded as Freeview, launched its service. This was a free to air service. It offered 30 TV channels and 16 radio stations.
April 2003	ITC and BBC published joint report on 'Progress Towards Digital Switchover'.
June 2003	BBC moved all their satellite services from encrypted to non-encrypted allowing access to viewers without a Sky viewing card.
June 2003	The Digital TV Consumer Expert Group was set up.
September 2003	Tessa Jowell, Secretary of State for Culture, Media and Sport, announces government's commitment to switchover.
September 2003	DTI published the report "Digital Television for All – a report on usability and accessible design".
March 2004	Top Up TV launched a service on the DTT platform offering elements of 10 premium channels on a subscription basis.
March 2004	Ofcom published the report 'Driving Digital Switchover'.
April 2004	SwitchCo, the organisation which will co-ordinate the switchover to digital television, was launched.
October 2004	BSkyB launched a Free to View digital satellite service.

October 2004	The Digital TV and Consumer Expert Group published their report 'Persuasion or Compulsion? Consumers and Analogue Switch-off'
November 2004	DTT Technical Trial (switch off trial) started. The selected transmitting station was Ferryside in West Wales. After 3 months of receiving DTT (having self-installed STBs etc), households were asked if they wished to retain DTT or revert to analogue. 98% of the 85% who responded asked to retain DTT and analogue was switched off.
November 2004	Publication of the Consumer Panel Report 'Supporting the most vulnerable consumers through digital switchover'.
November 2004	Completion of the 'Digital Television Action Plan'.
December 2004	Ofcom issues Digital Replacement Licences to the Channel 3 companies, Channel 4, Five and Teletext.
February 2005	The UK submits preliminary proposals for post switch over planning of the VHF and UHF broadcasting spectrum to the Regional Radiocommunication Conference.
February 2005	Ofcom published a consultation document 'Planning Options for Digital Switchover'
February 2005	Ofcom launch consultation on 'Provision of Managed Transmission Services to Public Service Broadcasters'.
March 2005	Government published the BBC Charter Review Green Paper 'A Strong BBC, Independent of Government'
March 2005	Analogue signals were switched off in the households that took part in the DTT Technical Trials as those who participated wished to retain the digital services.
April 2005	ITV acquires multiplex operator SDN
April 2005	Ofcom publish 'Broadcasting Transmission Services – A Review of the Market'.

June 2005	Ofcom issued 'Planning Options for Digital Switchover: Statement' within which they announce that they will be supporting a mix of mode and power which allows for DTT coverage to reach at least the same proportion of households after switchover as are reached by current analogue broadcasts.
June 2005	Ofcom published 'Reviews of financial terms for Channel 3 and Channel 5 licences'.
September 2005	Government announce the 2008-2012 time-table for digital switchover. The Secretary of State also announced a support scheme to make sure that no one is left behind in the switch.
December 2005	Ofcom published Digital Dividend Review looking at the spectrum that would be released on digital switchover
January 2006	"Digital Switchover Programme – Programme Structure" was published by Ofcom, DTI and DCMS.
May 2006	BBC launches their HDTV service on cable, satellite and Freeview. Sky launches their satellite HDTV service.
October 2006	Ofcom published "Review of wholesale digital television broadcasting platforms"
December 2006	Ofcom published "Data Limits on Digital Terrestrial Television Multiplexes – a statement on guidance".
December 2006	Ofcom published "Switchover related changes to DTT Licences – a statement following consultation".
April 2007	BBC and ITV announce high definition Freesat service to launch Spring 2008.
May 2007	Government published 'Digital Switchover Help Scheme - A Scheme Agreement Between DCMS and the BBC'. The Scheme Agreement sets out the detailed eligibility criteria and governance rules under which the Digital Switchover Help Scheme will operate.
June 2007	Digital Switchover (Disclosure of Information) Act 2007 is published.

Annex 3: Legislation

Broadcasting Act 1996

The legislative framework for DTT was formed by a Conservative Government in the Broadcasting Act 1996. The 1996 Act introduced a two-tier structure whereby the carriage and delivery system, the multiplex, would be licensed separately from the programme and additional services carried on the multiplexes. Additional services are not programme or programme-related services (such as sub-titling) and include Electronic Programme Guides, games services and text and other information services.

Of the six multiplexes available, one was gifted to the BBC and two were reserved for the existing commercial terrestrial broadcasters (Channel 3, Channel 4, Channel 5, S4C and Public Teletext). The public service broadcasters were required to broadcast their existing analogue channels on the DTT platform (the so-called simulcast services). The provision of these digital simulcast services were licensed by amendments to their existing (analogue) licences. On the rest of their gifted capacity they were free to provide new services.

The BBC was authorised to provide DTT services under revised terms to its Charter, whilst the Independent Television Commission was given responsibility under the 1996 Act to licence the other five multiplexes and to award the three that had not been reserved.

The award of multiplex licences to BDB in 1998 and the subsequent re-advertising and award of the licences in 2002 were carried out under the 1996 Act. The 1996 Act also stipulated the selection criteria to be applied. Details appear in Section 4.3 below.

Communications Act 2003

The 2003 Act, along with the precursory Office of Communications Act 2002, established Ofcom as the new converged regulatory body responsible for broadcasting, communications and spectrum. Its legal form is that of a 'statutory corporation' with links to the Department of Trade and Industry (now the Department for Business Enterprise and Regulatory Reform, BERR) and the Department for Culture, Media and Sport (DCMS).

The duties previously carried out by the ITC (and those of the Broadcasting Standards Commission, the Director General for Telecommunications, the Radio Authority and the Radio-communications Agency) were transferred to Ofcom but, importantly, the 2003 Act also gave Ofcom limited responsibilities for overseeing BBC services and the power to fine the BBC for non-compliance.

Areas in which Ofcom has a role to play include programme standards, programming and production quotas/codes, the impact of the BBC's activities on the wider market and use of radio spectrum. The latter two are worth considering in some more detail. All of them are discussed in a Memorandum of Understanding drawn up between Ofcom and the newly-formed BBC Trust in 2007, following the renewal of the BBC's Charter³⁰.

The assessment of any significant changes to the BBC's UK Public Services, where Ofcom must conduct an *ex ante* Market Impact Assessment (MIA). The BBC Trust has a duty to consider the competitive impact of the BBC's activities on the wider market. To this end, the Trust must adopt and publish a statement of policy as well as codes dealing with those aspects of the operation of the BBC's public services that in its view could raise significant issues regarding the competitive impact of the BBC's activities. The Trust must have regard to any fair and effective competition codes issued by Ofcom (in relation to non-BBC broadcasters) to the extent that the Trust considers them to be relevant. The Trust must also have regard to Ofcom's views on the matters that should be covered by the Trust's codes; and

Under the Act (section 3(2)(a)), Ofcom is required to secure the optimum use of the radio spectrum. Likewise, the BBC Trust is obliged to secure the efficient use of the radio spectrum which the BBC or its contractors use. The Secretary of State may direct the BBC to grant a public service broadcaster the right to use the BBC's television multiplex capacity, in which case Ofcom may revise or issue a new licence.

Finally, with regard to the BBC, the Act makes provision for Ofcom to seek payment directly from the BBC to cover the costs it incurs in performing these BBC-related regulatory duties.

³⁰ Memorandum of Understanding between the Office of Communications (Ofcom) and the BBC Trust, BBC and Ofcom, 2007 <http://www.ofcom.org.uk/about/accoun/mou/mou.pdf>

The 2003 Act also amended a series of provisions within earlier Acts; those with a direct bearing on DTT include the must-carry obligations, ownership constraints and data capacity limits.

Must-carry obligations

Section 242 of the 2003 Act amended the 1996 Act such that Ofcom would be able to include conditions in any multiplex licence granted under that Act to ensure that:

- all digital programme services and digital additional services provided by the BBC may be carried on that multiplex;
- the digital sound programme services broadcast under the licence are either provided by the BBC or licensed under section 60 of that Act; and
- a licensee does not show undue discrimination either against or in favour of a digital sound programme service provider, or restrict that provider's ability to share any of his spare capacity (unless it is reasonable to do so in order to ensure the technical quality of the multiplex service).

Ownership constraints

A number of changes were made to ownership constraints. These include:

- A relaxation in the rules governing common ownership of Channel 3 regional licences, which paved the way for Carlton and Granada, owners of BDB, to merge into a single ITV company;
- A relaxation of the so-called 20:20 rule that prevented an owner with a share of 20 per cent or more of the national newspaper market from controlling a licence or owning more than 20 per cent of a regional or national television broadcaster (but only with regard to Channel 5, not Channel 3);
- Removal of the prohibition on entities established outside the European Economic Area owning Broadcasting Act licences (including multiplex licences as well as Channel 3 and 5 licences)

Note also that, prior to the 2003 Act coming onto the statute books, a legislative change was introduced in 2001 that removed the previous prohibition on any person holding more than three multiplex licences. Under Statutory Instrument No. 223³¹, the number of multiplex licences that a single person may hold was increased to six. In addition, the person may hold no more than 20 percent of a seventh licence and no more than 10 percent in an eighth. These limits are reduced if the person provides multiplex service to either the BBC, Channels 3 or 4 or the Public Teletext licensee.

Data capacity limits

Under the 1996 Act (section 12(1)(h)), at least 90 percent of digital capacity on any multiplex must be available for broadcasting digital programmes and related services. An amendment in the 2003 Act (section 242) gave Ofcom discretion to set a higher threshold; only the Secretary of State could set a lower limit. In June 2006, Ofcom issued draft guidance on how this limit should be interpreted and invited responses.

Some multiplex operators responded with a request for the data capacity to be increased but this a decision that can only be made by the Secretary of State.

³¹ *The Broadcasting (Limit on the Holding of Licences to Provide Television Multiplex Services) Order 2001*
<http://www.opsi.gov.uk/SI/si2001/20010223.htm>