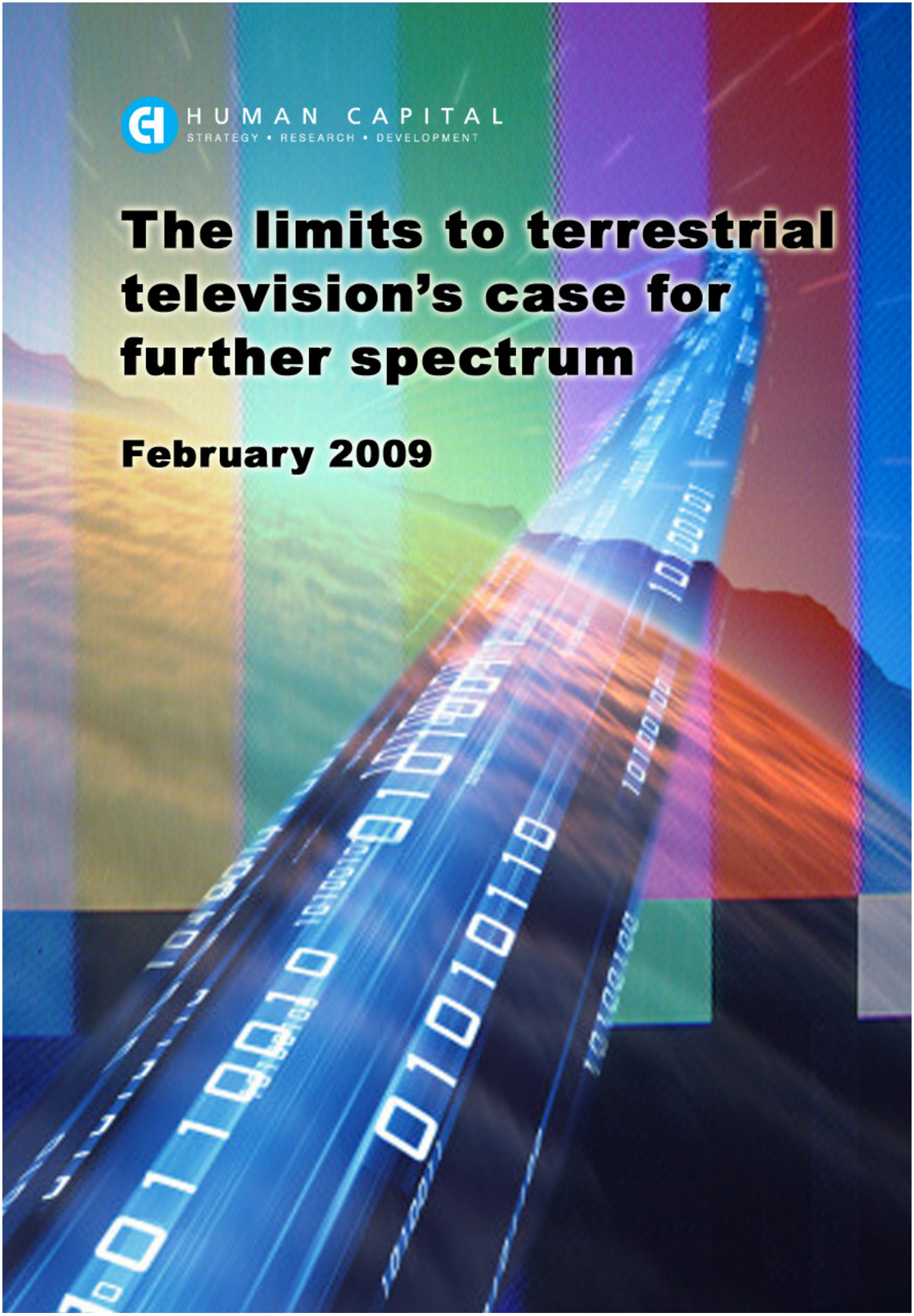
HUMAN CAPITAL
STRATEGY • RESEARCH • DEVELOPMENT
The limits to terrestrial television's case for further spectrum
February 2009

*Copies of this report are available at: **www.humancapital.co.uk/GSMA***

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# Contents

## 1. Executive Summary

As many countries around the world prepare to switch off analogue terrestrial TV signals, important decisions need to be made about how to use the freed up radio spectrum. Some or all of this "digital dividend" could be allocated to digital terrestrial television (DTT), whilst some of it may be set aside for other purposes. This paper argues that TV's case for absorbing the entire digital dividend is weakening.

Firstly, terrestrial broadcast is diminishing in importance as households increasingly choose non-terrestrial TV platforms. These vary by region – in Africa free satellite is dominant, whilst in Asia analogue cable is widespread – but everywhere this transition is likely to continue, thanks to new and more attractive satellite offers, the digitisation of cable networks, the bundling of pay TV with telephony and broadband, and the entry of IPTV into the mainstream. Thus in spite of a short-term increase due to ASO, in 2013 DTT households will be in a minority in each of Asia Pacific, North America and Europe.

Secondly, choice on DTT is already considerable, with many mature DTT markets offering in excess of 20 channels available free-to-air. The debate over the digital dividend relates not to these existing services, but to how far the platform should be expanded. Moreover, DTT broadcast is likely to get substantially more efficient over the coming years, meaning more channels will be delivered through the existing bandwidth. Thus further DTT spectrum would not be for mainstream channels, which will be available anyway, but rather for relatively niche channels, likely attracting less than 10 minutes per week of viewing per household.

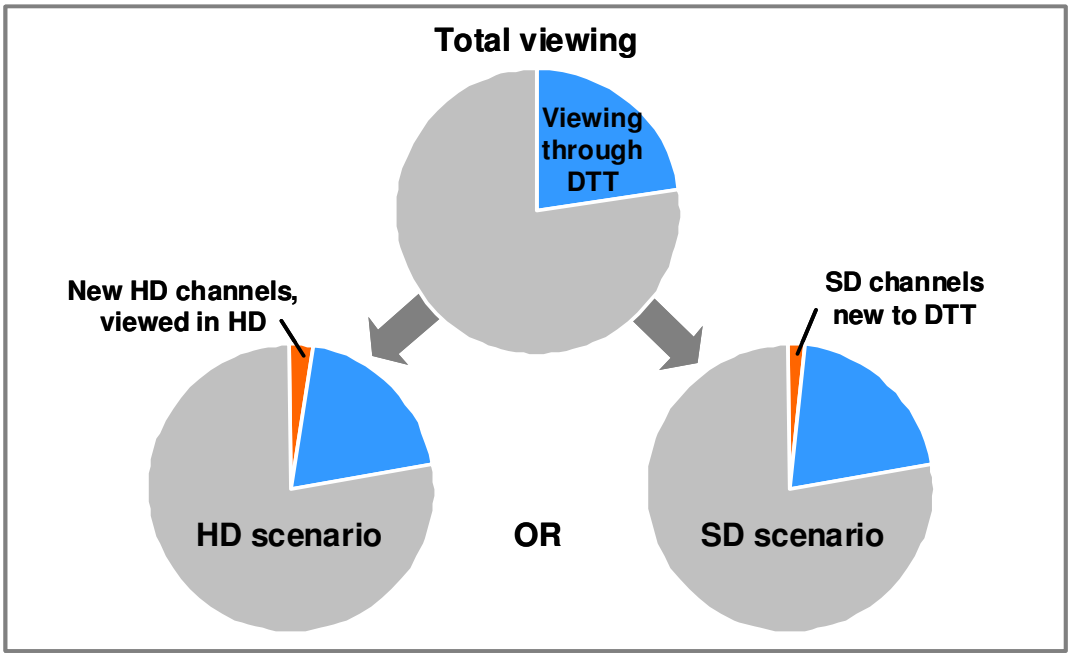
Thirdly, there are two possible uses the DTT platform might make of further spectrum – providing more niche channels in standard definition (SD), or upgrading major channels to high definition (HD). However, the value of each is undermined by the fragmentation of viewing and by characteristics of the DTT audience. Existing niche SD DTT channels command such small audiences that we can expect viewing to new channels to be low, and such services may be delivered more cost effectively in the future by online TV. HD upgrades for major channels are rendered less worthwhile by their declining audiences, and the penetration of HD-capable equipment in DTT households is forecast to remain low.

Finally, the free-to-air broadcast model which underpins DTT is subject to mounting commercial pressures, particularly in mature markets. The fragmentation of audiences means that broadcasters are finding their financial health weakened. Largely fixed costs, combined with declining advertising volumes and rates, results in margins being squeezed. Furthermore, the broadband video internet will threaten TV's position as an advertising medium in the future, since it will be able to offer similar reach and impact, augmented by superior targeting and interactivity.

Subscription revenues are gradually overtaking advertising as the principal source of funding for TV, and it is right to be concerned about the prospects for ad-funded channels which would be filling any additional DTT spectrum.

In order to demonstrate the effect of these combining factors, we can look at a potential scenario for TV viewing in Western Europe in 2012. Figure 1 shows the share of viewing likely to be taken by DTT, followed by two circles which represent alternative scenarios for viewing in 2012, if 100 Mhz of additional digital dividend spectrum is given to DTT.

*Figure 1: Indicative diagram showing share of viewing in Western Europe in 2012 for new DTT channels provided by the allocation of 100 Mhz to TV (best case)*




Thus channels added using this additional spectrum would represent a tiny share of total viewing, 2.7% in the HD scenario and 1.8% for SD, inevitably materially limiting the societal and economic benefits of any such allocation.

## 2. Introduction

Countries around the world are in the process of converting traditional analogue terrestrial television broadcasting to digital television broadcasting. By the end of 2009, all full-power US television will be digital. France will complete the switchover in 2011 and Russia and the Philippines in 2015. Kenya will be among the first countries in Africa to implement digital broadcasting with switchover now planned for 2012.

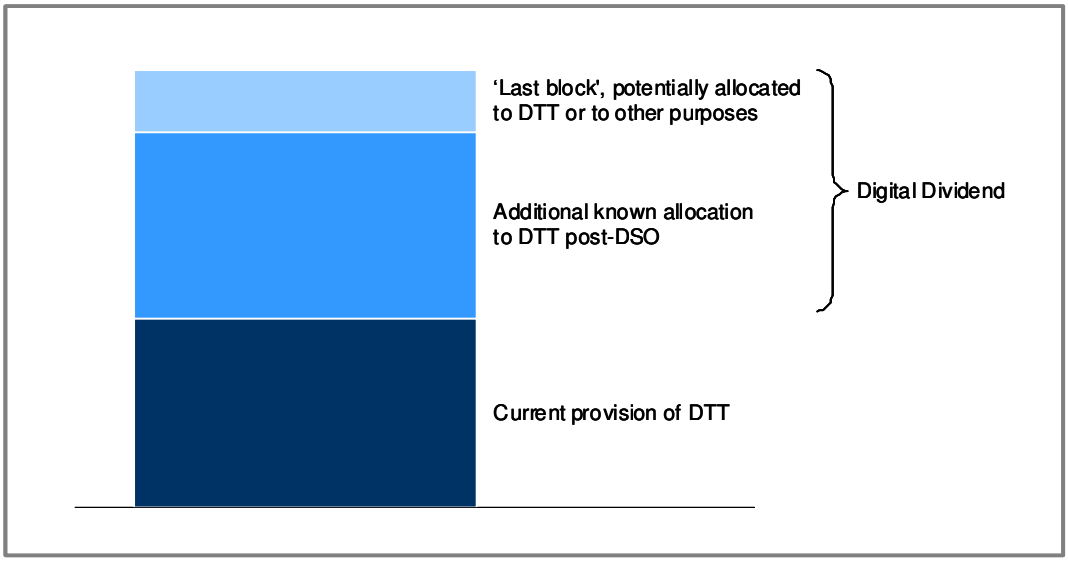
The transition is known as the digital 'switchover' (DSO) and has been motivated by a broad range of benefits. Arguably the most important of these is the freeing up of spectrum.

This freed up spectrum, known as the "digital dividend", is a valuable public resource which can be used for a range of purposes. Options include allocating further spectrum to digital terrestrial television (DTT), which would allow for new channels or high definition versions of existing channels, or allocating some of the spectrum to mobile broadband.

DTT is already a significant part of the television landscape in many markets, and for some consumers it provides a vital free alternative to paid TV services delivered via satellite or cable. There is wide agreement that regardless of how the digital dividend is deployed, broadcasters should have at least as much DTT spectrum available to them as today. The debate is around how much additional spectrum they should receive, to provide new channels or high definition versions of existing channels.

In most countries, DTT is likely to receive the majority of the spectrum freed up by DSO. The debate remains over whether a portion should be reserved for other uses.

*Figure 2: Current DTT provision and the digital dividend (conceptual)*



We do not specifically address the value of the 'last block' but clearly there will be diminishing returns as ever more spectrum is allocated to DTT beyond the current provision.

TV's case for spectrum is threatened by rapid and fundamental changes in the market, such as: rising pay-TV adoption; rising broadband adoption; fragmentation of viewing across many channels; improving data compression; and the economic realignment of the industry. We believe that in combination these changes significantly reduce the incremental return from additional (or higher definition) TV channels on DTT. It is therefore vital for national regulatory authorities to consider these dynamics when deciding how best to make use of the digital dividend.

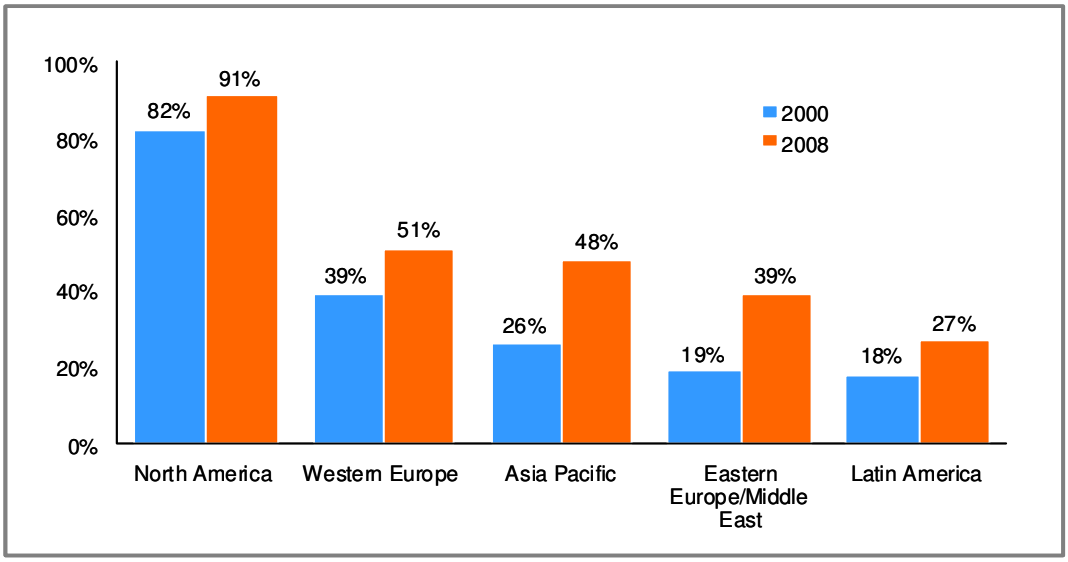
Although commissioned by the GSMA, the opinions contained in this report are entirely those of Human Capital.

## 3. The decline of terrestrial TV

- Terrestrial TV is becoming less important as more and more households worldwide switch to non-terrestrial platforms
- This trend is set to continue, buoyed by the digitisation of cable networks, the spread of satellite TV in emerging markets and the bundling of pay TV with broadband and telephony
- As broadband penetration rises and speeds increase, online video and IPTV will also begin to make a significant impact
- As a result, by 2013 terrestrial households will be in a minority in each of Asia Pacific, North America and Western Europe
- This will limit the number of households that would benefit from further DTT spectrum

There has been a dramatic transition over the last decade, with a substantial percentage of households shifting away from terrestrial to cable or satellite platforms.

*Figure 3: Penetration of non-terrestrial TV by region, 2000 and 2008*[1]



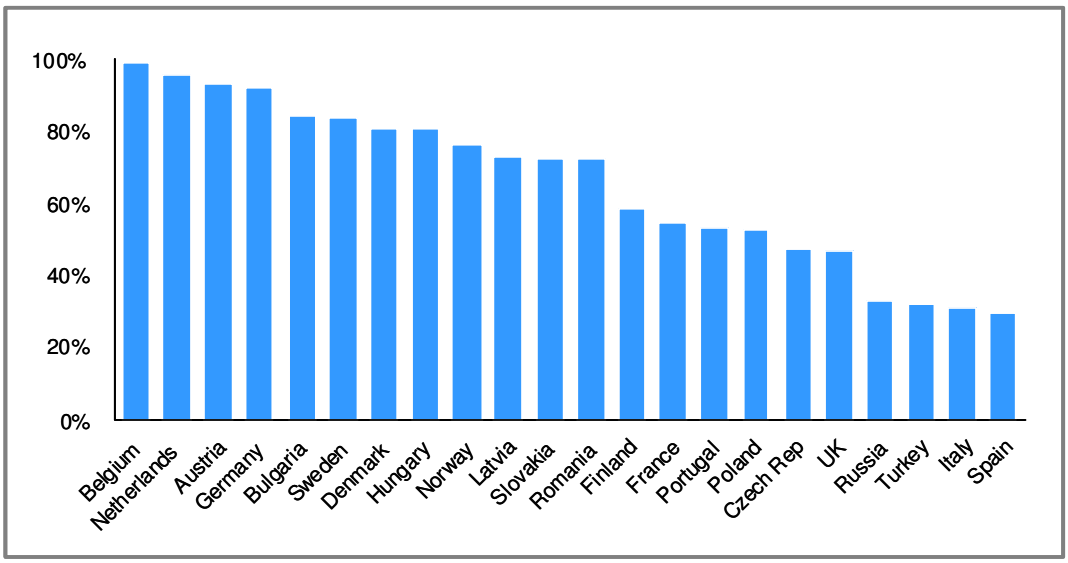

Non-terrestrial TV households are now in a significant majority in numerous countries, leaving the number of households reliant on terrestrial broadcasting greatly reduced.[2]

[1] Human Capital analysis of Informa Telecoms & Media, TV International Volume 16 Numbers 20-22. This data corresponds to the combined penetration of non-terrestrial platforms – digital satellite, analogue cable, digital cable and IPTV – but omits analogue satellite

[2] Note that pay TV households may use DTT on secondary sets, though we believe that the public value impact of unavailability of certain channels on these sets when they are available on the main set is limited

Overall penetration of non-terrestrial TV platforms in Western Europe is now greater than 50%, with some countries such as Belgium, the Netherlands, Austria and Germany registering at 90% or higher. In Central and Eastern Europe penetration is also high, driven largely by the extensive cable infrastructure present in countries such as Bulgaria, Hungary and Latvia.

*Figure 4: Pay TV penetration in Europe by country*[3]




Growth is rapid too in emerging markets. For instance, in Africa year-on-year growth of multichannel homes to Q2 2008 was 7%, made up almost entirely of new satellite subscriptions, with countries such as South Africa (12% growth, 23% pay TV penetration) leading the way.[4] Free-to-air satellite penetration is particularly strong in North Africa, standing at 94% in Algeria and 79% in Tunisia.[5]

The expansion of non-terrestrial TV in Western Europe is being driven largely by the gradual digitisation of analogue cable networks, and the improved services which these upgraded networks can provide. Kabel Deutschland provides cable connections to 9.2 million homes in Germany (almost 25% of total TV households), and spent €316 million in the fiscal year 2007/2008 upgrading its network. Now over 70% of connectable households are equipped with return channel capability, meaning that Kabel Deutschland can deliver IPTV video on-demand services in addition to linear programming.

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[3] European Audiovisual Observatory, *Yearbook 2008 Volume 1: Television in 36 European States*

[4] Human Capital analysis of Informa Telecoms & Media, *TV International Volume 16 Number 22* (November 2008), p.8 & Informa Telecoms & Media, *TV International Volume 16 Number 22* (October 2008), p.10

[5] Human Capital analysis of Informa Telecoms & Media, *TV International Volume 16 Number 14* (July 2008), p.12

Seamlessly integrated cable/IPTV propositions are also proving compelling in France, where Numericable has been making massive investments in its fibre optic cable network. It now offers triple-play VOD TV, broadband and telephone packages, with connection speeds of up to 100 Mbps, and its TV subscriber numbers increased from 2 million at the beginning of 2007 to 3.5 million a year later.[6] Across all European markets, increasing desire for fast broadband speeds and interactivity is making such bundled cable TV offerings more attractive.

Other countries are seeing correspondingly dramatic developments in satellite TV penetration. Cyfrowy Polsat is the leading provider in Poland, one of the world's fastest growing and most competitive markets for satellite TV, with six different services now available. From 0.65 million subscribers in 2005, Cyfrowy Polsat's subscriber base has grown to 2.4 million in September 2008 (17% of Polish TV households), boosted largely by its strength in sports rights.[7] Overall penetration for satellite TV in Poland has risen from 7% in 2003 to 26% in 2008.[8] Similarly rapid growth has been seen over the last few years in Romania, Slovakia and the Czech Republic, making satellite the fastest growing TV platform in Eastern Europe.[9]

This shift towards pay TV has fed through into share of viewing. Given that satellite and cable households are heavier consumers of TV, terrestrial has an even smaller share of viewing than it does of households. Whereas satellite-only homes in the UK watch an average of 6.3 hours a day, DTT households watch just 5.4 hours.[10]

Over the coming years, the move towards non-terrestrial platforms will be further augmented by the growth both of IPTV (delivered via a closed, managed IP network to the TV through a set-top box) and also of online TV (viewed via a web-based interface on a PC). IPTV is still a nascent industry in most of the world, with the exception of Hong Kong, where 37% of TV households have a connection of this type.

France is the European leader in IPTV. 12% of the TV market has been captured by providers such as Orange, Neuf Cegetel and Free, who offer triple-play TV, internet and telephone packages for as little as €30/month.[11] IPTV has also made inroads in other European markets such as Norway (7% of TV households) and Belgium (6%), and is forecast to reach 8% penetration across Western Europe by 2012.[12]

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[6] Informa Telecoms & Media, TV *International Volume 16 Number 3*, p.7

[7] Ibid.

[8] Informa Telecoms & Media, *Global Digital TV 7th Edition*, pp.26-27

[9] Human Capital analysis of Informa Telecoms & Media, *Global Digital TV 7th Edition*, pp.26-27

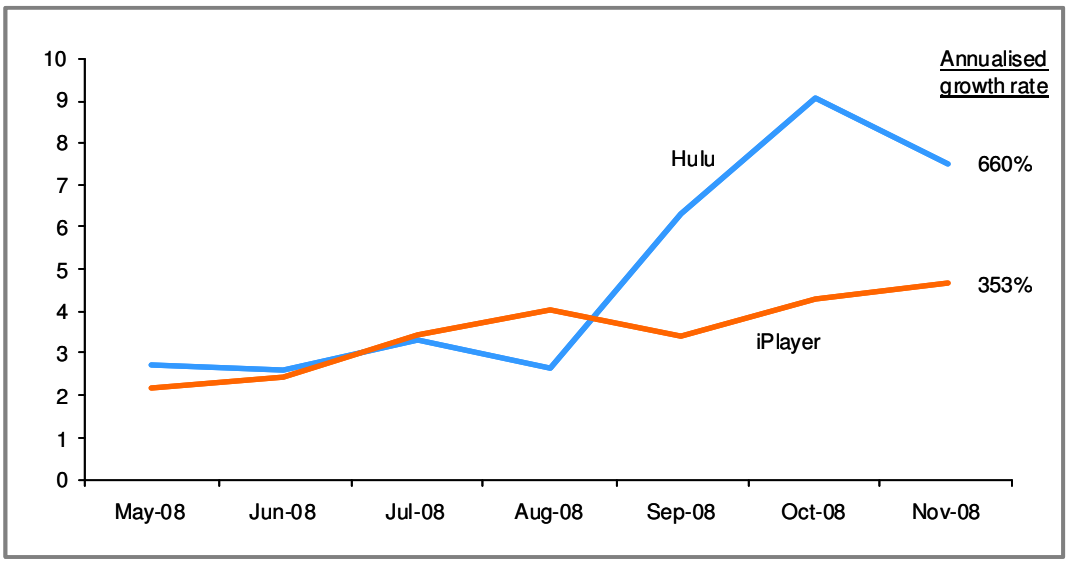
[10] BARB 2008. Note that analogue-only households watch even less TV – an average of just 4.7 hours a day

[11] Informa Telecoms & Media, Global *Digital TV 7th Edition*, p. 31

[12] Ibid.

Whereas IPTV has been driven by the efforts of telecoms providers, online TV remains largely the preserve of traditional broadcasters and their offshoots. As a result, rather than being financed by subscription and pay-per-view models, online TV tends to be funded by advertising or licence fees. Figure 5 shows the rapid take-up during 2008 of Hulu, the ad-funded player developed by Fox and NBC in America, and iPlayer, the BBC's catch-up TV service, provided free to UK residents. Both services doubled their unique audience in the six months between May and November 2008.

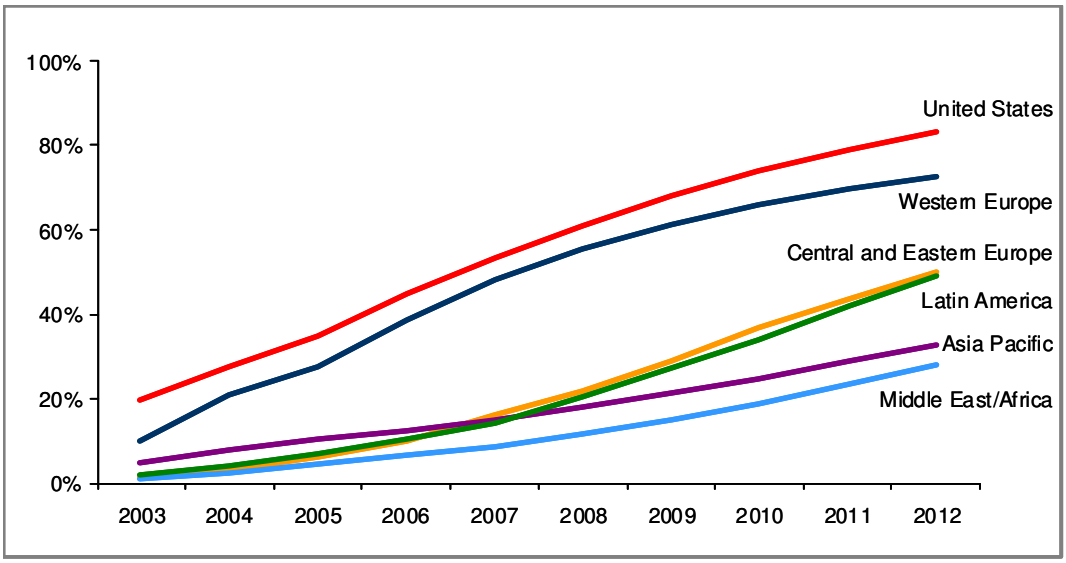
*Figure 5: Unique users to hulu.com and BBC iPlayer, May-November 2008 (millions)*[13]




Online TV is expected to see dramatic continuing growth, for a variety of reasons. Firstly, serious commitment from broadcasters and the clearing of intellectual property issues should result in the amount of available content increasing dramatically and online TV services becoming more attractive to users. Secondly, mainstream consumer uptake will improve the viability of innovative new services like Joost, the ad-funded internet TV services developed by the founders of Skype. Finally and most importantly, the rapid spread of broadband connectivity shown in Figure 6 will make such services available to an ever-widening audience.

[13] Nielson Online, *Hulu – One to Watch in 2009*; Nielsen Netratings

*Figure 6: Broadband households penetration forecast by region, 2003-2012*[14]




Not only is broadband penetration rising rapidly, but speeds are increasing and prices dropping. Average advertised speeds in OECD countries more than quadrupled between 2004 and 2007, from 2.0 Mbps to 9.0 Mbps, with Japan, France, Korea and Sweden leading the way.[15] Point Topic estimate that the worldwide average price per megabit of bandwidth decreased between Q1 2008 and Q3 by an annualised rate of 45%.[16]

These changes mean that broadcasters are coming to see interactivity as critical to their future, and are making plans that will ensure that they can meet consumer demand. Canal+ in France unveiled their new set-top box in October 2008. Known as Le Cube, it is Europe's first satellite box to use an ethernet port to provide video on-demand and interactive services. Meanwhile in the UK, the BBC announced plans in December 2008 to collaborate with ITV and BT on a common platform for IPTV, subject to regulatory approval. It will be delivered to the TV via a broadband connected Freeview set-top box and is known for the time being as Project Canvas. Canvas is expected to use its broadband connection to deliver targeted on-demand or archive content.

The rise of broadband also stimulates pay TV adoption beyond IPTV. Since operators increasingly offer attractively priced 'triple-play' bundles of telephony, broadband and pay TV, for a household with telephony and broadband already, the incremental cost of pay TV can be very low. The number of such households is growing rapidly as broadband becomes a 'must have'.

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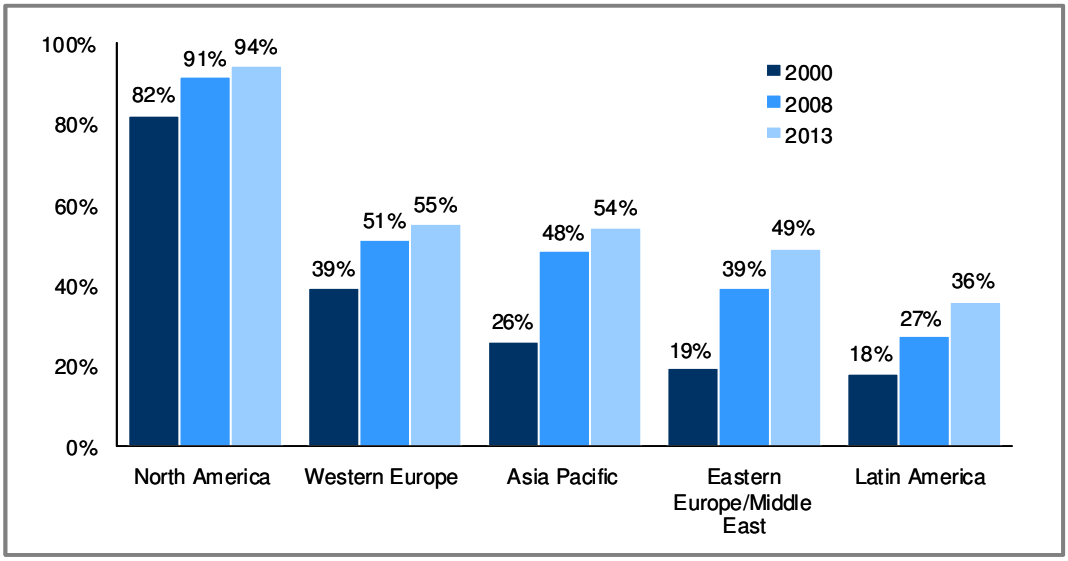
[14] PricewaterhouseCoopers, *Global Entertainment and Media Outlook: 2008-2012*, p.126

[15] OECD, *Broadband growth and policies in OECD countries* (June 2008), p.40

[16] Human Capital analysis of Point Topic, *Consumers worldwide getting a better deal on broadband* (15th November 2008)

The net result of the launch of IPTV combined with the continuing success of satellite and cable will be to decrease further the number of households dependent on terrestrial.

*Figure 7: Forecast penetration of non-terrestrial TV by region, 2000-2013*[17]




Thus it will be an ever diminishing number of households that DTT will serve exclusively, meaning that the fixed cost of allocating spectrum for TV will be shared by ever fewer users.

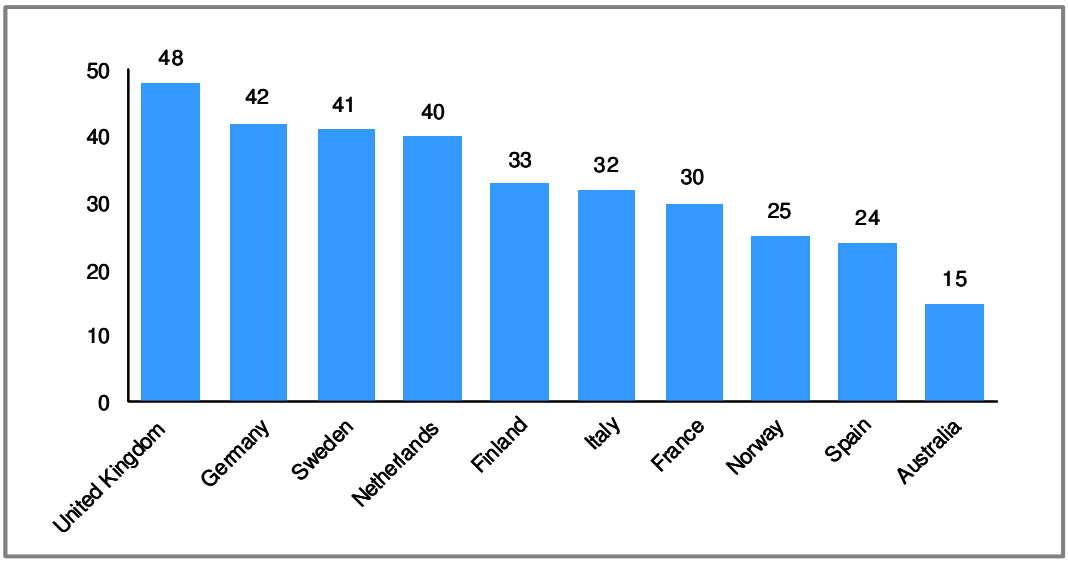
[17] Human Capital analysis of Informa Telecoms & Media, *TV International Volume 16 Numbers 20-22*. This data corresponds to the combined penetration of non-terrestrial platforms – digital satellite, analogue cable, digital cable and IPTV – but omits analogue satellite

## 4. Substantial existing availability of digital terrestrial TV

- DTT already delivers over 20 channels in many countries
- Decisions over digital dividend spectrum concern how far to expand this current selection of channels, not whether some channels will be removed. As a result, the value delivered by the main public service broadcasters is not under threat, since they are already on the DTT platform
- Compression technologies are improving rapidly, so that more channels can be broadcast using the same amount of spectrum. This will make the accommodation of high definition channels within existing bandwidth more manageable
- Thus DTT will continue to provide an attractive and improving offer to audiences with or without digital dividend spectrum

Notwithstanding the shrinking audience for terrestrial TV, substantial blocks of spectrum have already been allocated to TV, providing significant choice of channels on DTT.

*Figure 8: Number of channels available on DTT in selected countries, end of 2007*[18]




Thus it is critical to note that the debate about usage of digital dividend spectrum is not about securing the future of mainstream or even middling channels – these are already available on DTT.[19] The choice of how much digital dividend spectrum to allocate to TV is instead a question of how far to expand the existing set of channels.

[18] European Audiovisual Observatory, *Yearbook 2008 Volume 1: Television in 36 European States*; DTT providers' websites

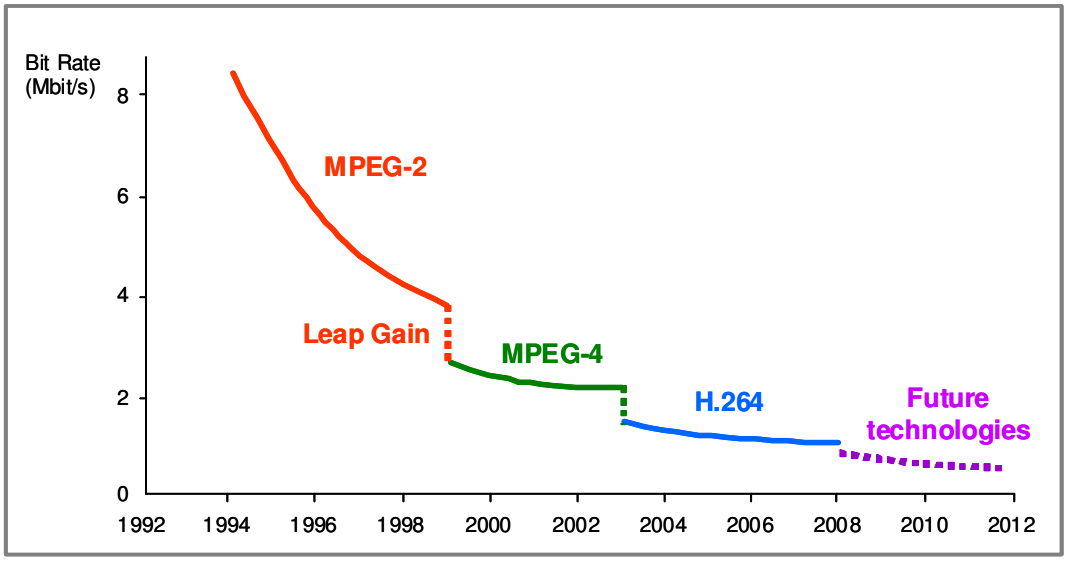
[19] Note that although digital dividend decisions will not reduce the amount of spectrum available to DTT, clearing a band for other uses may involve reallocation

The public value delivered today by DTT will be safeguarded along with the channel portfolios of the major public service broadcasters. The case for allotting spectrum to further marginal channels must therefore be made primarily on commercial grounds. For instance, in Germany the full portfolio of ARD/ZDF channels is already included in the current 42 channels. If spectrum were made available for a 43rd channel, it would be one without public service objectives.

Moreover, thanks to increasingly effective compression technologies, a given amount of DTT spectrum will, over time, be able to support an increasing number of channels. The French regulatory authority, the Conseil Supérieur de l'Audiovisuel, has taken the lead on compression technologies, mandating that all new set-top boxes, tuners and TVs must be MPEG-4 compatible. France has been able, as a result, to be at the forefront of free-to-air high definition TV (HDTV), with four such channels now being broadcast on the DTT platform without the use of any extra spectrum. Since launch in 2005, compression gains of 30% have been achieved.[20]

Consequently whereas BBC1 in standard definition (SD) is broadcast at roughly 5 Mbps in the UK using MPEG-2 (and BBC1 in high definition (HD) requires 18 Mbps via satellite), multiplex R5 in France broadcasts TF1 HD, France 2 HD and M6 HD at just 7-8 Mbps each. Further compression gains are also likely in the future: ITEA forecast HD broadcasts at 6 Mbps in the medium term[21] and Figure 9 shows the evolution of compression technologies over time for broadcasting SD channels.

*Figure 9: Stylised evolution of compression technologies over time, for SD broadcast*[22]




[20] Aurélien Louis and Matthieu Roger, *The roll-out of DTT in France* (2008), p.3

[21] Information Technology for European Advancement, *HD4U: a European HDTV platform*, p.3. HD at 6 Mbps would allow four channels to be broadcast on one multiplex

[22] Video Networking Laboratory, *Future Performance of Video Codecs* (November 2006), p.4

The immediate gains possible through the transition from MPEG-2 to MPEG-4 compression effectively double the amount of channels that can be broadcast per 24 Mbps multiplex from 8 to 16. This change is likely to be costly in countries with mature DTT markets, since consumers will be required to upgrade their set-top boxes. In nascent DTT countries, however, services can be launched using MPEG-4 from the outset. This has been the case in much of Eastern Europe, where DTT is either recently launched or still at the planning stage, for instance in Estonia, Lithuania, Poland and Slovakia.

## 5. The fragmentation of viewership

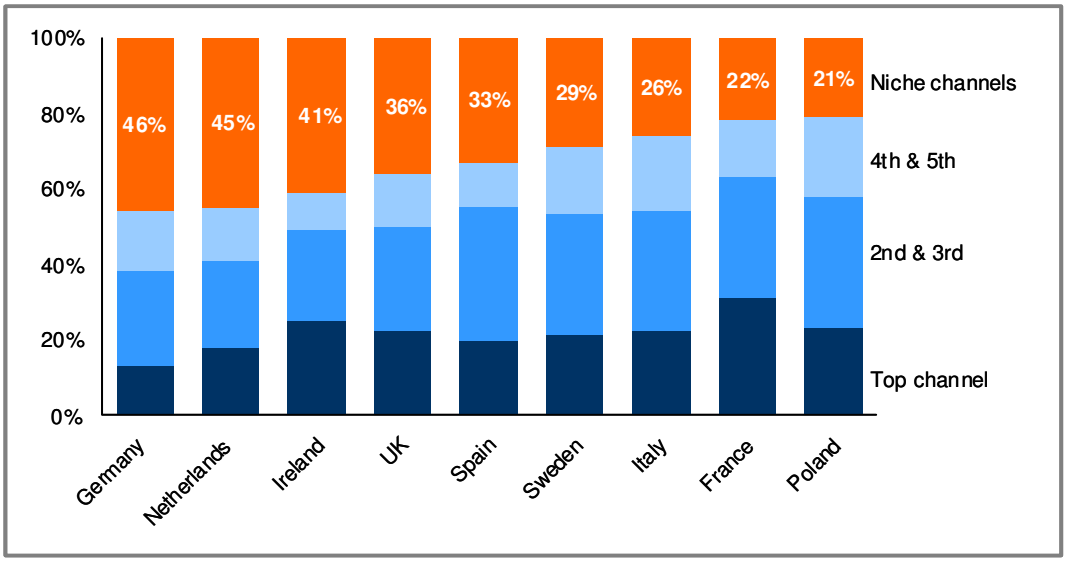
- Digital dividend spectrum used for TV can be allocated either for broadcasting further channels in standard definition (SD), or upgrading existing major channels to high definition (HD)
- Fragmentation of audiences and the number of channels already available on DTT mean that further SD services would be likely to have small audiences. As a result, DTT may not prove a cost effective transmission mechanism for such niche channels
- The penetration of HD-capable TVs in DTT households is forecast to remain low, so any upgraded HD channels would reach only a small number of viewers. Furthermore, the major channels that would be the likely recipients of spectrum for HD are losing share, further decreasing their potential HD audience
- As a result, further channels broadcast using digital dividend spectrum, whether in HD or SD, would have a very limited impact in terms of share of viewing

The rise of multichannel television has had a dramatic impact on share. Previously three to five channels used to dominate. Now viewership has atomised, with the major channels seeing substantial share drop, and with a new plethora of niche channels each having small share. In the UK, for example, the number of channels has expanded from 57 in 1998 to almost 350 today.

This expansion has been seen right across the world, not least in Europe. In 20 out of the 27 European Union countries, 100 or more channels are accessible via satellite, cable or IPTV.[23] As a result, the share of viewing taken by incumbent terrestrial channels has shrunk. In many Western European countries the most popular channel accounts for as little as 20% or less.

[23] Human Capital analysis of European Audiovisual Observatory, *Yearbook 2008 Volume 1: Television in 36 European States*

*Figure 10: Share of viewing taken by top 1, 3 and 5 channels in selected European countries (2007), with remaining share taken by smaller, niche channels*[24]




This represents a substantial change from a decade ago, when channels outside the top 5 accounted for just 10% and 7% of viewing in the UK and France respectively.[25]

This shift in viewing patterns has important consequences for a decision to allocate further spectrum to DTT. Broadly this spectrum could be used in two ways for TV – to upgrade the larger channels to high definition (HD), or to add further standard definition (SD) channels.

### *5.1 Using spectrum for more standard definition (SD)*

The explosion in channel availability has resulted in the fragmentation of viewing, leaving numerous channels with very small share. Breakdowns of audience share by channel for DTT in the UK and France reveal very similar profiles, as Figure 11 and Figure 12 show.

[24] Ofcom, *The International Communications Market 2008*, p.178

[25] Human Capital analysis of Screen Digest, *Observatory of Public Service Broadcasting in Europe* (2004), pp.78-80

*Figure 11: Share of viewing by channel via DTT, UK (2008)*[26]

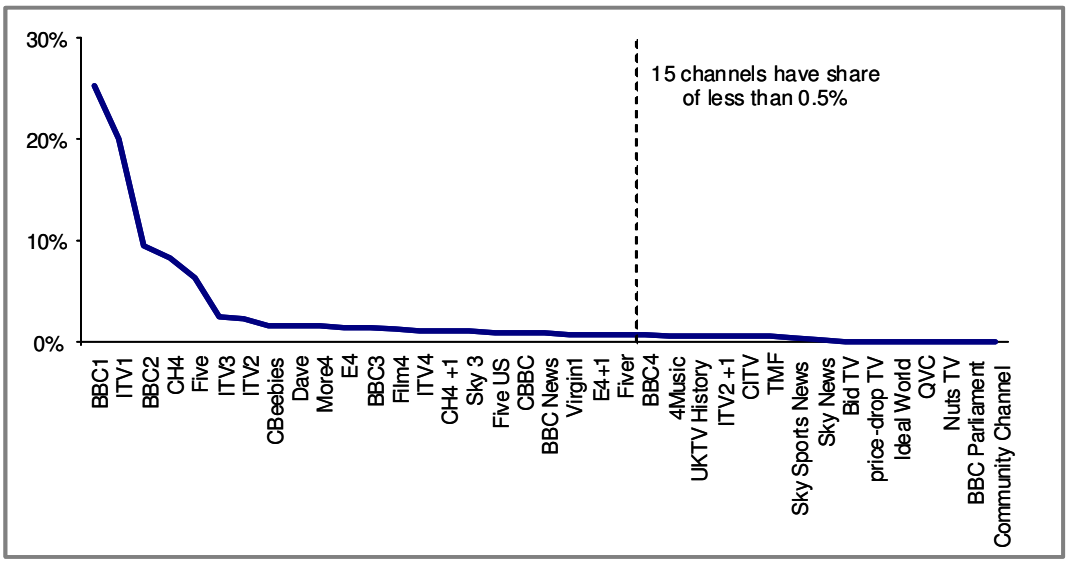
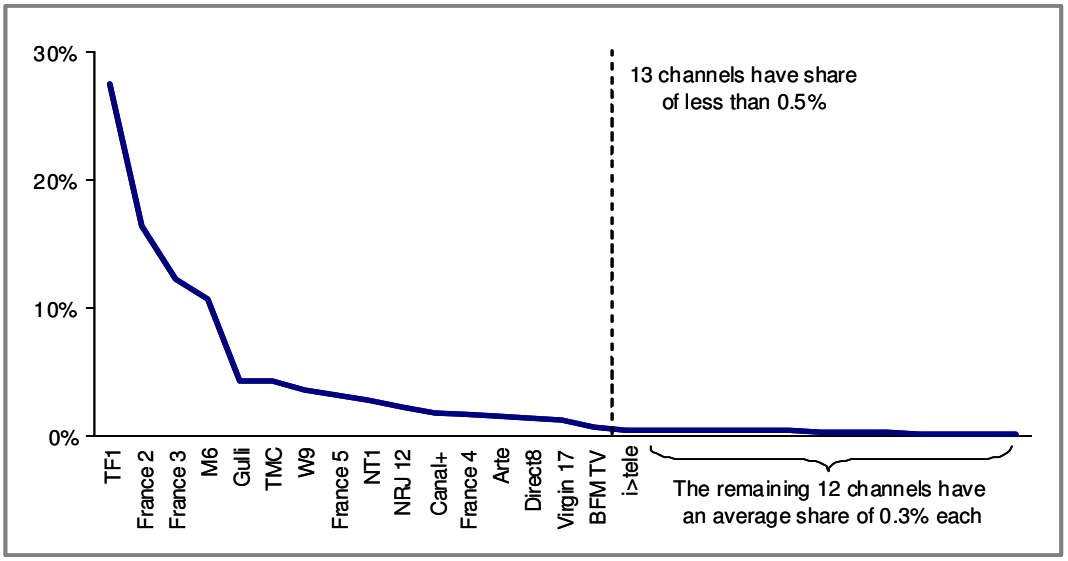



*Figure 12: Share of viewing by channel in DTT households, France (March 2008)*[27]




In both cases the top channel accounts for more viewing than all channels outside the top 6 put together, which amounts to 31 in the UK and 23 in France.

[26] BARB 2008

[27] European Audiovisual Observatory, *Yearbook 2008 Volume 1: Television in 36 European States*, p.116

To allocate further spectrum for SD channels is to make space for channels likely to be even further down the long tail than these. Given the low volume of viewing of the smallest channels already included, these extra channels are likely to have very small volumes indeed.

To put these small channels' volume of viewing in practical terms, we can look at it in minutes per week. For instance, the fourth smallest UK channel, QVC, accounts for just 1 minute's viewing per week per person in DTT homes, whilst the thirteenth smallest channel in France, i>tele, makes up 7 minutes per week.

In other European markets the situation is similar: n-tv in Germany accounts for 6 minutes viewing per week per person, whilst RTL8 in the Netherlands makes up 9 minutes and TV4 Fakta in Sweden takes 7 minutes.[28] These are by no means the smallest DTT channels in their respective countries, rather they are niche channels owned and run by major commercial broadcasters: n-tv and RTL8 by the RTL Group, and TV4 Fakta by TV4, the largest commercial channel in Sweden. It is inherent in the nature of terrestrial broadcast that these tiny channels require just as much spectrum as the most popular channels[29] – clearly they will therefore have a much lower 'return per MHz' than the bigger channels.[30]

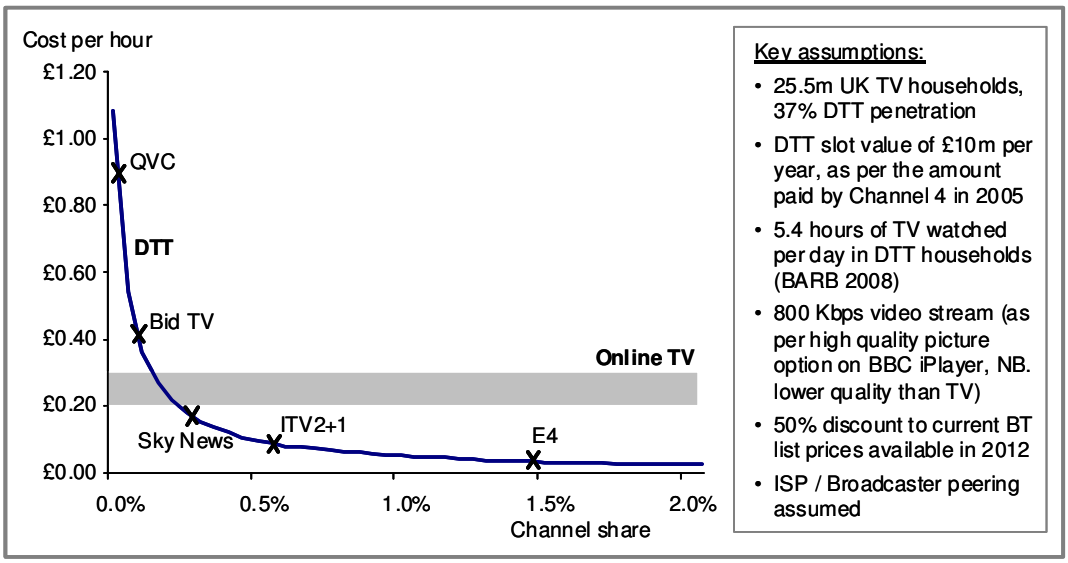
Put another way, tiny channels will have a much higher transmission cost per viewer hour (if the cost of spectrum is included), so that DTT broadcasting may not be the most efficient means of distribution. Spectrum costs are fixed and therefore as a channel's share gets smaller the transmission cost per hour rises rapidly. However, for online TV the cost per hour is largely fixed regardless of scale, meaning that at a certain point it becomes a more suitable delivery mechanism for targeted, niche content, as Figure 13 shows.

[28] Germany (Uberall TV), Netherlands (Digitenne) and Sweden (Boxer TV) data is for 2007, and is for all households, rather than just DTT. Channel share data sourced from European Audiovisual Observatory, *Yearbook 2008*; average viewing time data from Ofcom, *The International Communication Market 2008*, p.177

[29] Subject to different decisions regarding levels of compression

[30] Clearly 'value' here is not the same as popularity, and there can be some channels with small share which provide great public value, for instance parliamentary channels in France and the UK. However, it may still be the case that DTT is not the most cost effective transmission method for such services, and that they can be provided free to the consumer using online TV

*Figure 13: Indicative delivery cost per hour via DTT and online TV in the UK*

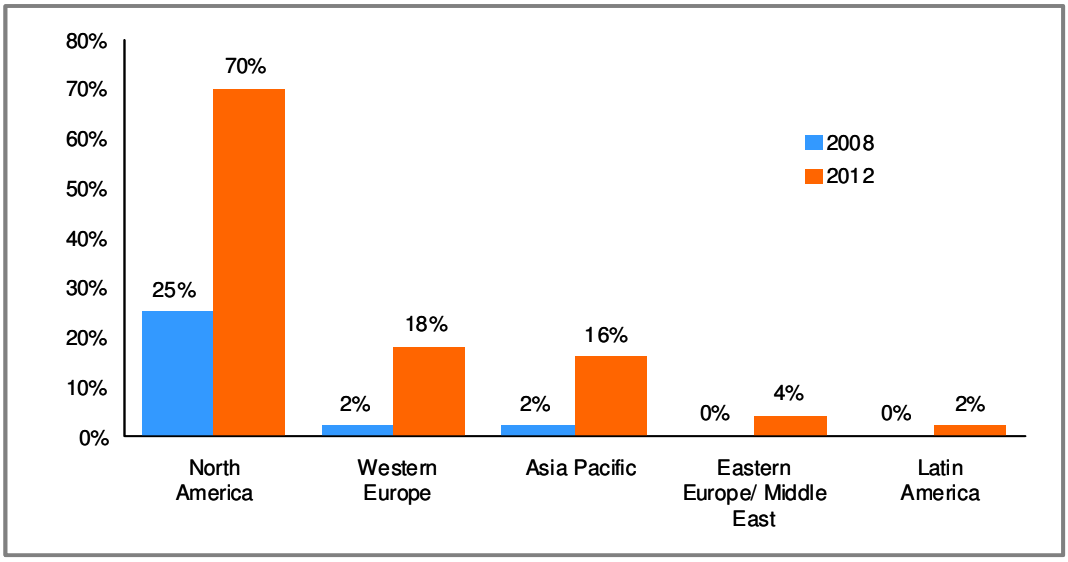



It is likely that further SD channels added to DTT will be far down the long tail and account for a very small share of viewing. As a result, their cost per viewer hour will be high, meaning that online TV may be a more appropriate and cost effective transmission method.

### *5.2 Using spectrum for more high definition (HD)*

The other possible use for spectrum allocated to DTT is to upgrade some channels to high definition (HD). However, the number of people able to view HD broadcasts is likely to remain small, since outside North America HDTV sets are expected to have relatively low penetration for some years to come.

*Figure 14: Active HDTV homes as a percentage of total TV households, 2008 and 2012 forecast*[31]

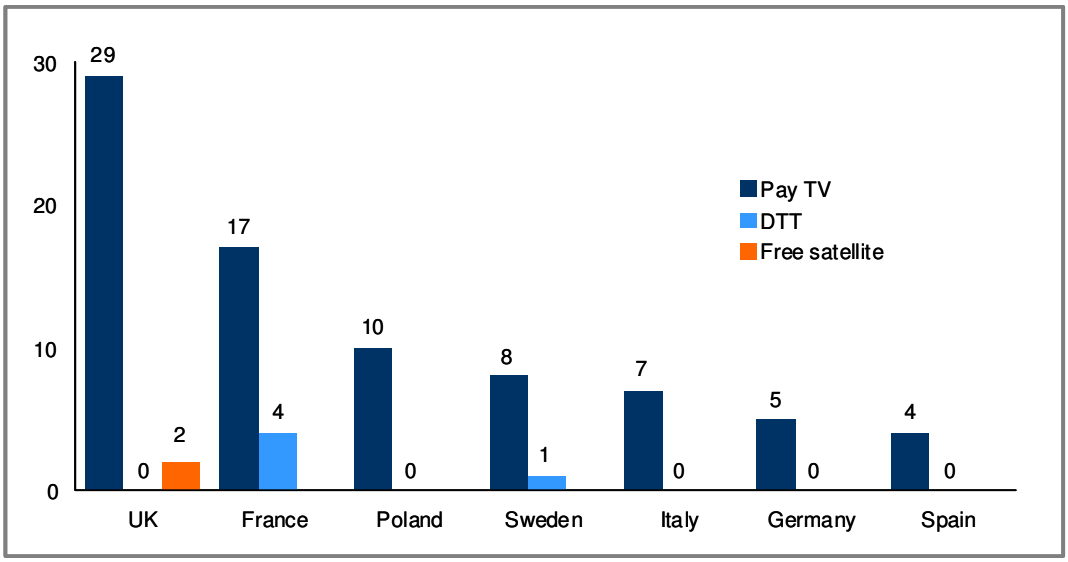



[31] Informa Telecoms & Media, *TV International Volume 16 Number 6* (April 2008), p.2

Furthermore, of multichannel homes, DTT households are the least likely to have HD. In 2012 HD penetration in Western European DTT households is forecast to be 15%, whereas HD penetration in Western European satellite homes is expected to be higher, at 32%.[32]

Moreover, pay-TV platforms tend to have far more HD channels available at the moment, given the much higher bandwidth of these platforms. We expect this to remain the case in 2012. This in turn encourages those interested in HD to become pay platform subscribers.

*Figure 15: HD channels in Europe, pay-TV and free-to-air*[33]



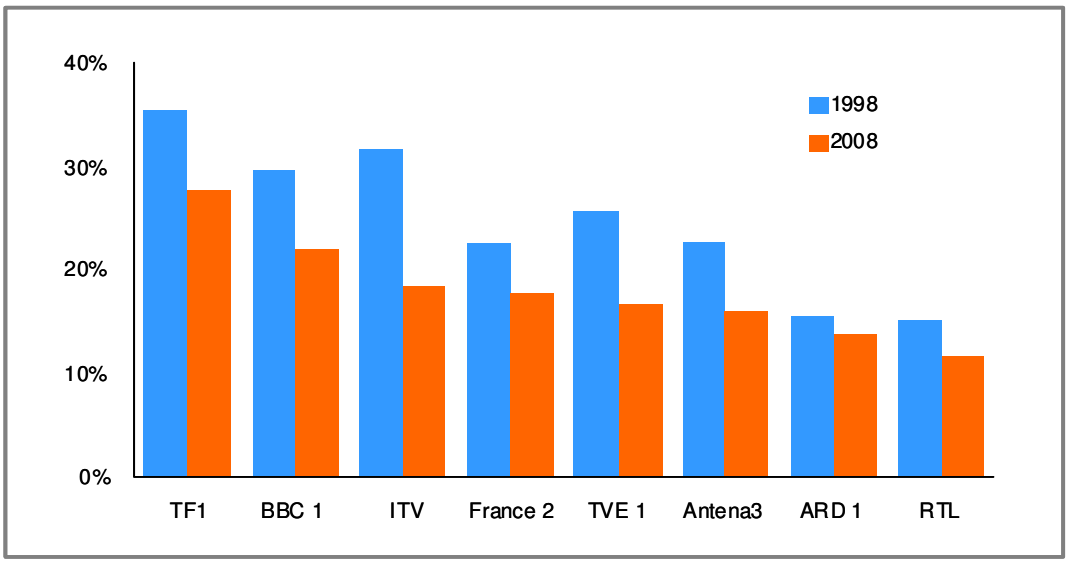

Although plans are in place for four DTT HD channels in the UK by 2012, at the moment only France and Sweden have HD channels available on terrestrial TV. BBC HD and ITV HD are currently delivered over Freesat in the UK, and such free-to-air satellite platforms may prove more suitable for broadcasting a range of HD channels than DTT, since bandwidth is not so scarce. The French free-to-air satellite platform, TNTSat, has proved successful so far, signing up over 1 million customers by the end of 2008, and similar projects are taking off in countries where terrestrial TV coverage can be poor, such as New Zealand.

If spectrum were to be used to launch HD channels on DTT, then presumably it would be the mainstream channels which would initially receive the extra bandwidth. However, the value of upgrading these channels to HD is directly related to their audience size and the fragmentation of viewing means that the larger channels have appreciably smaller audience shares than they once did.

[32] Human Capital analysis of Informa Telecoms & Media, *TV International Volume 16, Number 6 (April 2008)*, p.2 & Informa Telecoms & Media, *Global Digital TV 7th Edition*, p.2.

[33] Human Capital analysis of http://en.kingofsat.net/hdtv.php; broadcasters' websites

*Figure 16: Loss of share of top two channels in France, Germany, Spain and the UK, 1998 vs. 2008*[34]




To use DTT spectrum to upgrade major channels to HD is therefore to allocate substantial blocks of bandwidth to channels with declining audience share, on the platform least likely to have HD viewers. So whilst it may be the case that a small number of HD channels are necessary to secure the competitiveness of DTT as a platform and prevent its marginalisation, the incremental benefits to society of upgrading channels outside of the top few rapidly diminish.

[34] Screen Digest, Observatory of Public Service Broadcasting in Europe (2004), p.78-81; Merrill Lynch, *Eurovision XXXII* (November 2008), p.19-30

## 6. The commercial environment

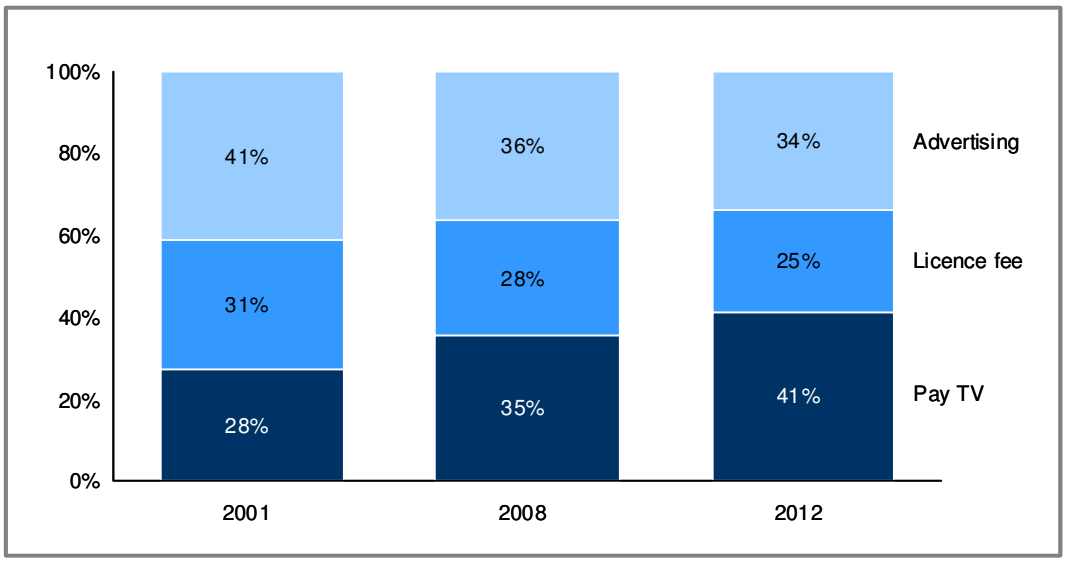
- There are multiple challenges to the free-to-air advertising-funded business model which supports channels likely to be added to DTT as a result of the digital dividend
- Major broadcasters are under pressure – whilst costs remain largely fixed, revenues are suffering due to the fragmentation of viewing. This leads to a decline both in ad volumes, since channels command a smaller share of viewing, and also in ad rates, since the leading channels' mass-market premium is eroding. The result is a squeeze on margins
- TV's future position as an advertising medium will be further threatened, as online advertising begins to offer reach, targeting and impact that in combination rivals TV
- There is concern for the future of ad-funded DTT channels. This uncertainty casts doubt on the case for using spectrum to expand their number

The analysis in previous sections has been relatively static as far as channel mix is concerned - that is, it has not taken account potential changes to the business models or viability of channels. However, given the seismic shifts underway for the broadcasters, these changes are important. In particular, if there are threats to the free-to-air ad-funded business model such that the financial viability of existing channels is in doubt, then it would not make sense to allocate yet more spectrum for additional channels.

The marginal channels are perhaps even less likely to be viable than existing ones, and even if they are viable, casualties amongst existing channels may free up further spectrum. Indeed since the launch of Freeview in the UK in 2002 the channel mix has been fairly volatile, with 15 channels leaving the platform.

The TV market has been moving away from the ad-funded model for some time. Pay-TV revenues overtook advertising income in North America in 2006 and are forecast to do so in Western Europe in 2009.

*Figure 17: TV revenue mix in Western Europe, 2001-2012*[35]




Whilst pay TV revenues are rising rapidly, in many more mature markets broadcasters reliant on advertising are finding their financial health threatened. Advertising income has been impacted because viewing is now split amongst ever more channels. This means that the average channel has less viewing, and hence a smaller share of the total TV ad spend. Since costs are largely fixed in the TV business, this drop in share can have a material impact. Note that this dynamic can threaten both big and small channels. Larger channels tend to have expensive content, and so a given percentage drop in viewing can be just as damaging.

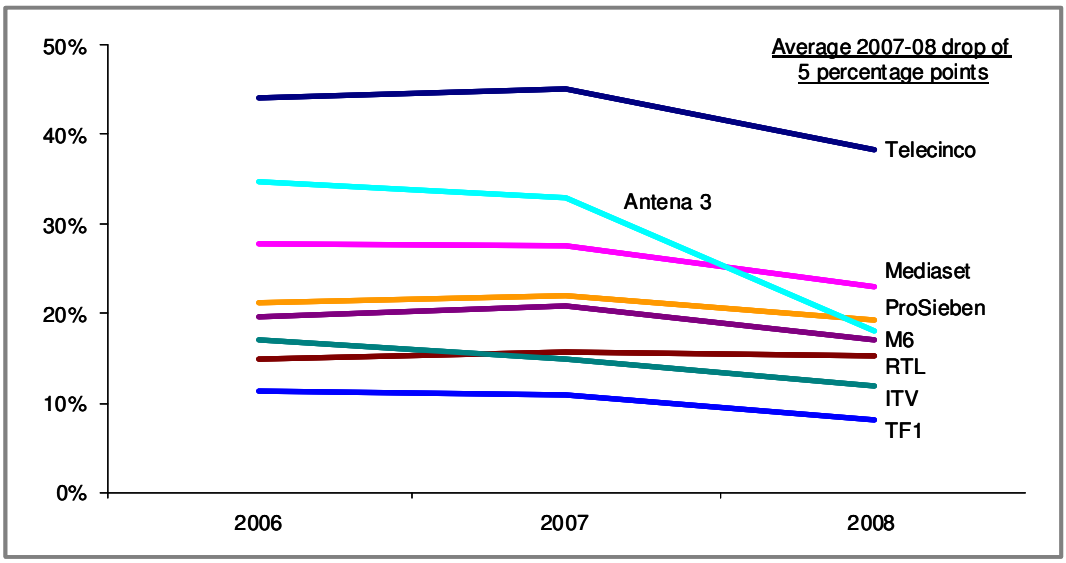
Ad rates for the major broadcasters are threatened as well as ad volumes. Previously TV was uniquely able to reach mass markets for advertising, which supported higher costs per thousand (CPTs). The contraction of audiences for these broadcasters erodes this advantage. Even in the robust economic environment of 2006-07 there was no growth in nominal CPTs for Italy, Spain and the UK, whilst France and Germany experienced a slight drop-off.[36] Dresdner Kleinwort forecast CPTs to fall in all five countries from 2008 onwards, at a rate of approximately 1% per year.[37]

[35] Human Capital analysis of Screen Digest, *TV Economics and the Digital Switchover* (February 2008), pp.24 & 26

[36] Dresdner Kleinwort, *European Broadcasters* (November 2008), p.50

[37] Ibid., pp.26-28

*Figure 18: EBIT margins of leading commercial broadcasters, 2006-2008*[38]




The combined impact of these factors on the financial health of broadcasters has been a squeeze on margins, as shown in Figure 18. The groups which are holding up the best are those that are either large rights-holders and producers of independent content (for example RTL), or operators of pay TV channels (ProSieben), rather than those reliant on free-to-air broadcasting. The average drop in margins suffered by these eight broadcasters was 5 percentage points.

Furthermore, by 2012 the internet will be a real threat to TV ad spend. To date, limited broadband adoption and speed has meant that there has not been substantial substitution of TV advertising by the internet. However, in the years ahead video advertising online will be able to offer reach and visual impact approaching that of TV, combined with far greater targeting, tracking and interactivity. These strengths have already allowed internet advertising to take spend away from other media, increasing its share from 4% in 2003 to 13% in 2008.[39] In the future, the video internet is likely to have a similar impact on TV as the text internet has on print media.

There is also concern that viewers will watch less advertising as a result of the rapid adoption of digital video recorders (DVRs), and that this will threaten the number of impacts that traditional broadcasting can deliver. By 2012, DVR penetration in DTT homes is forecast to reach 18% in Western Europe and 34% in North America.[40] The combined impact of a high degree of DVR adoption with web- or set-top box-based video-on-demand systems will also

[38] Human Capital analysis of Merrill Lynch, *Eurovision XXXII* (November 2008), pp.36-43

[39] PricewaterhouseCoopers, *Global Entertainment and Media Outlook 2008-2012*, p.165

[40] Human Capital analysis of Informa Telecoms & Media, *Global DVR Forecasts* (Oct 2008), p. 22; Informa Telecoms & Media, *Global Digital TV 7th Edition*, p.2; PricewaterhouseCoopers, *Global Media and Entertainment Outlook 2008-2012*

challenge the need for "+1" catch up channels on DTT (such as Channel 4 +1 in the UK), thereby potentially freeing up spectrum for new services.

Thus there are reasons to be cautious about the long-term future of the small ad-funded channels that would likely be the main users of additional DTT spectrum, in a climate where pay-TV income is taking over as the leading source of funding for TV, broadcasters' margins are being squeezed and TV advertising revenues are threatened.

There has also been anxiety that the deteriorating financial health of broadcasters may impact on the production of local TV content in Europe. Whilst this is a legitimate concern, it has limited relevance to decisions regarding use of the digital dividend. The biggest buyers and producers of locally produced content are the incumbent public service broadcasters, whose presence on DTT is secure, not the small niche channels or commercial broadcasters. 49% of programmes on public service channels in 2005 came from within the EU, whereas for advertising-funded channels the figure was just 16%.[41]

[41] European Audiovisual Observatory, *Some data to compare public and private TV programming*, p.6

## 7. Conclusions

This paper has not addressed the other possible uses of the digital dividend, and the analysis of the trade-offs between using a portion of the spectrum for mobile broadband (say) rather than TV are undoubtedly complex. However, these trade-offs are not about core public value channels, nor about providing further choice to the audience, nor about ensuring that DTT remains relevant by securing provision of HD. In any scenario these objectives are likely to be satisfied.

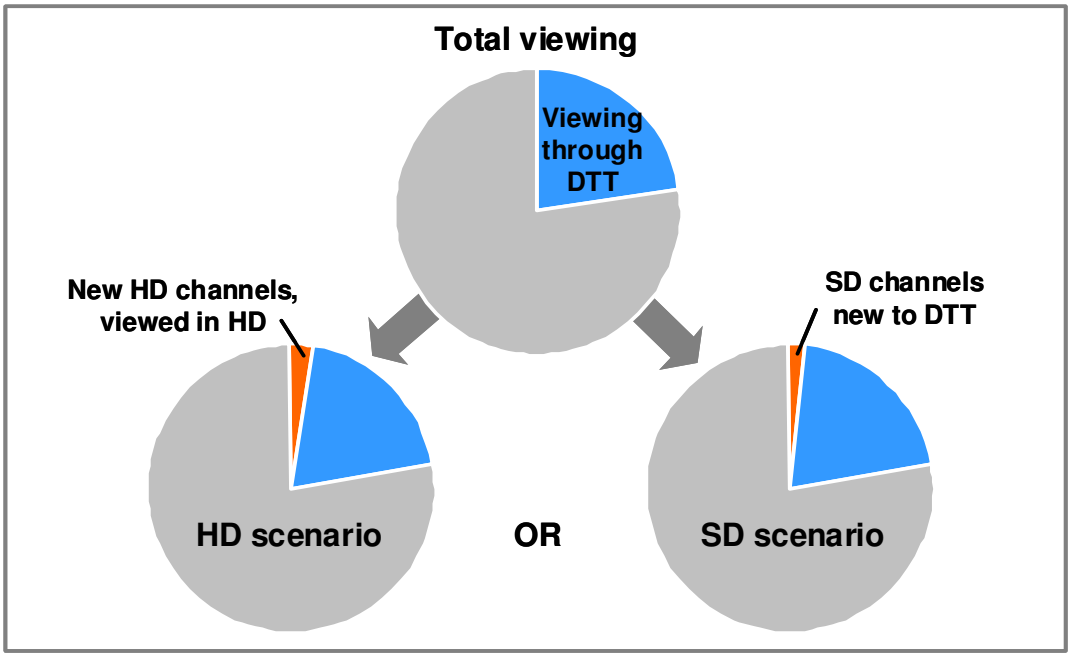
The discussion surrounding the allocation of the 'last block' of the digital dividend to TV concerns only a very small share of viewing, as a result of the combining factors discussed in this paper. In order to demonstrate the effect of these forces, we can look at a potential scenario for TV viewing in Western Europe in 2012. Figure 19 shows the share of viewing likely to be taken by DTT, followed by two circles which represent scenarios for viewing in 2012, if 100 Mhz of digital dividend spectrum is given to DTT.[42]

In the left-hand HD scenario the labelled slice represents the 2.7% share of viewing that 8 new HD channels would take up. Note that this is the most generous possible scenario, since it considers the most popular 8 channels. In practice many of these will be upgraded to HD anyway, even without DTT receiving 100% of the digital dividend, and thus the incremental benefit of further HD will be smaller than estimated here.

In the right-hand SD scenario the labelled slice shows the 1.8% share of total viewing that 16 new SD channels would take, assuming they average an audience share of 0.5% each. Small shares of this magnitude are likely, given that these channels would be adding to an extensive existing channel line-up, including channels with this level of share or less.

[42] 100 Mhz of spectrum could provide for 2 multiplexes, each capable of broadcasting a 24Mbps stream, given the use of 64-QAM. In the HD scenario it has been assumed that both use DVB-T2 and MPEG-4 technologies, making them able to broadcast a total of 8 HD channels but accessible only to those with up-to-date equipment. In the SD scenario both multiplexes have been deployed with universally accessible DVB-T and MPEG-2, allowing for 16 new SD channels

*Figure 19: Indicative diagram showing share of viewing in Western Europe[43] in 2012 for new DTT channels provided by the allocation of 100 Mhz to TV (best case)[44]*




Channels added using the final 100 MHz of digital dividend spectrum are thus likely to represent only a very small share of total TV viewing in 2012, even in Western Europe where DTT penetration will be comparatively high. The societal and economic benefits of such an allocation are inevitably limited by this small share. We believe, as a result, that TV's case for receiving the entire digital dividend is weakening and needs to be considered carefully.

[43] Western Europe has been used as an example here because of its mature DTT market. If global figures were used then the share would be even smaller, given lower DTT and HDTV penetration elsewhere

[44] Share of viewing forecast relies on data from the following sources: Informa Telecoms & Media, *Global Digital TV 7th Edition*, p.1; BARB 2008; Dresdner Kleinwort, *European Broadcasters* (November 2008), p.30; Impulsa TDT, *Monthly Report Extract Number 22* (November 2008), pp.3&5: Variety, *DTT steals French TV audience*; Conseil Supérieur de l'Audiovisuel, *Observatoire de l'équipement des foyers pour la réception de la TV numérique* (1er semestre 2008), p.7; Informa Telecoms & Media, *TV International Volume 16 Number 6* (April 2008), p.12; PricewaterhouseCoopers, *Global Entertainment and Media Outlook 2008-2012*; European Audiovisual Observatory, *Yearbook 2008 Volume 1: Television in 36 European States*

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