The impact of Announcing Analogue switch-off on UK Retailers and Manufacturers

Report to the Department of Trade and Industry

March 2004

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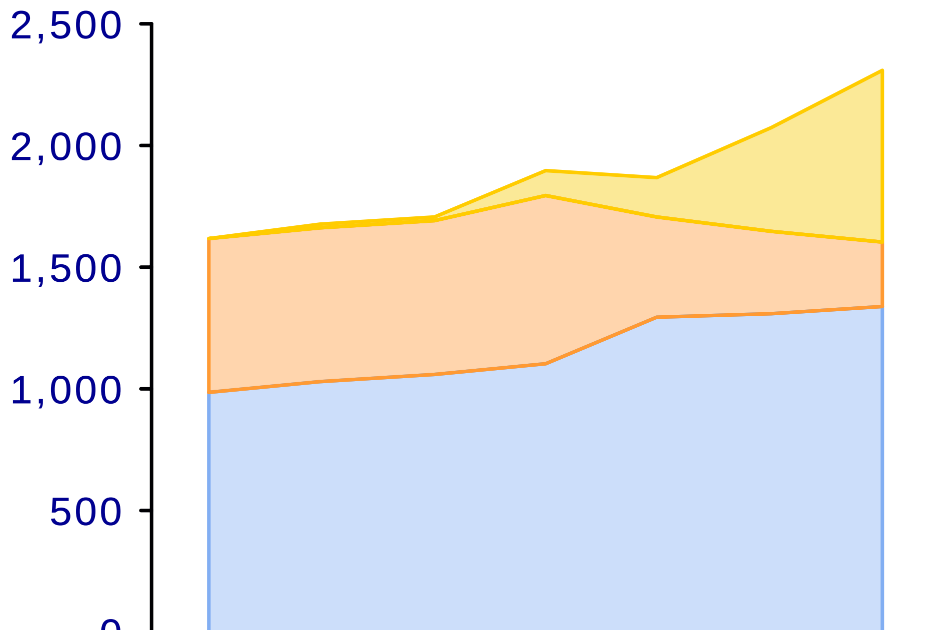
The UK TV market is changing from both a technology and a product point of view, but digital TV is not currently the driving factor

UK TV and Recorder Market

£ million



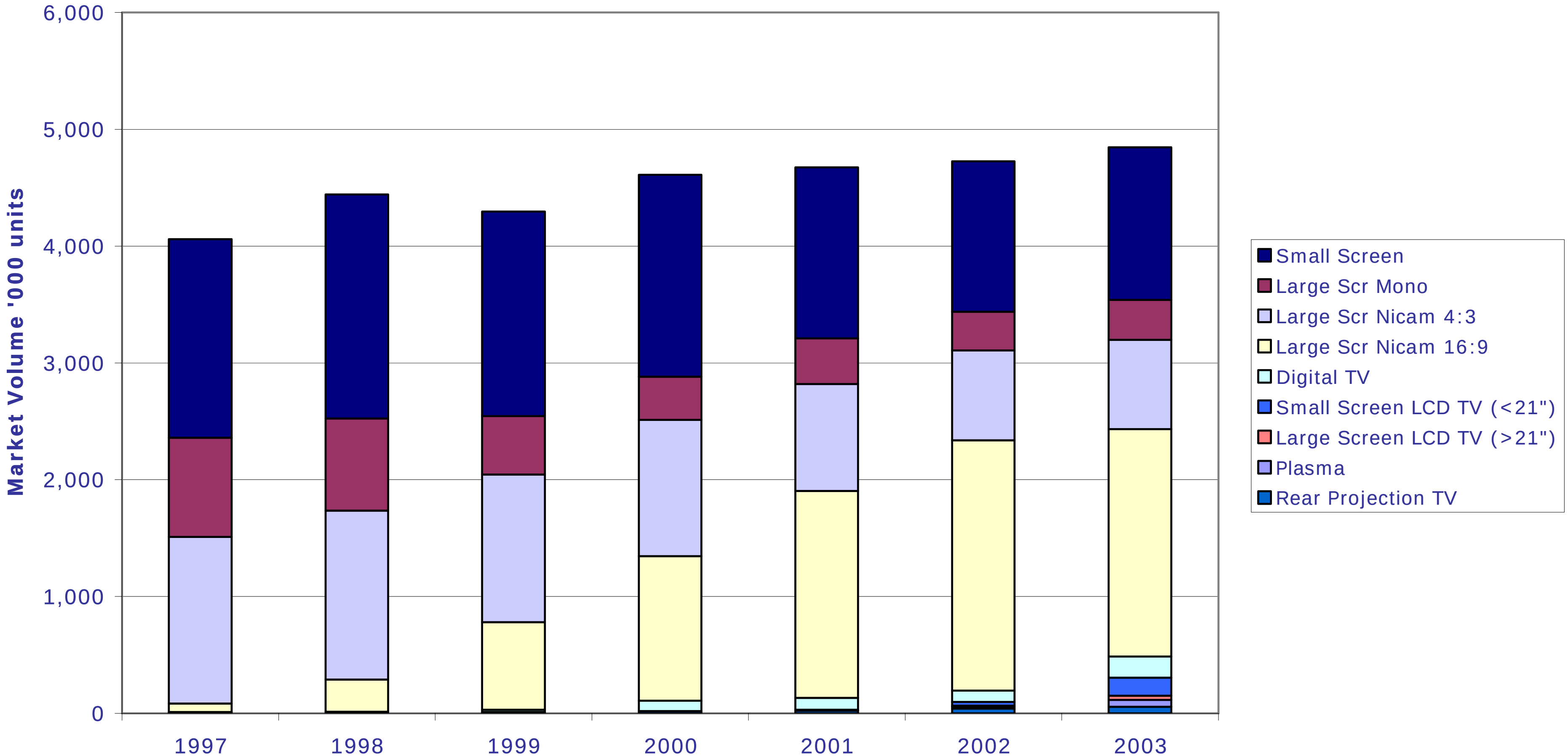
	1997	1998	1999	2000	2001	2002	2003
DVDs	0	6	13	100	170	420	711
VCRs	625	634	636	700	400	337	260
TV-sets	988	1,031	1,060	1,100	1,300	1,312	1,340

Source: Keynote, industry sources

- **The value of the market is driven largely by TV receiver sales, not recording devices**
- **The TV market has been changing as consumers increasingly buy large wide-screen equipment**
- **Consumers are now spending their money on flat panel TVs rather than high priced iDTVs, whose benefits they do not understand**
- **VCR sales are now declining rapidly as DVDs have become very popular**
- **DVD-Rs and PVRs will grow rapidly as the replacement for VCRs, but few are yet digital**
- **Set top box markets have become highly competitive with little margin**

The TV market has been changing as consumers increasingly buy large wide-screen equipment

Colour TV Market Size

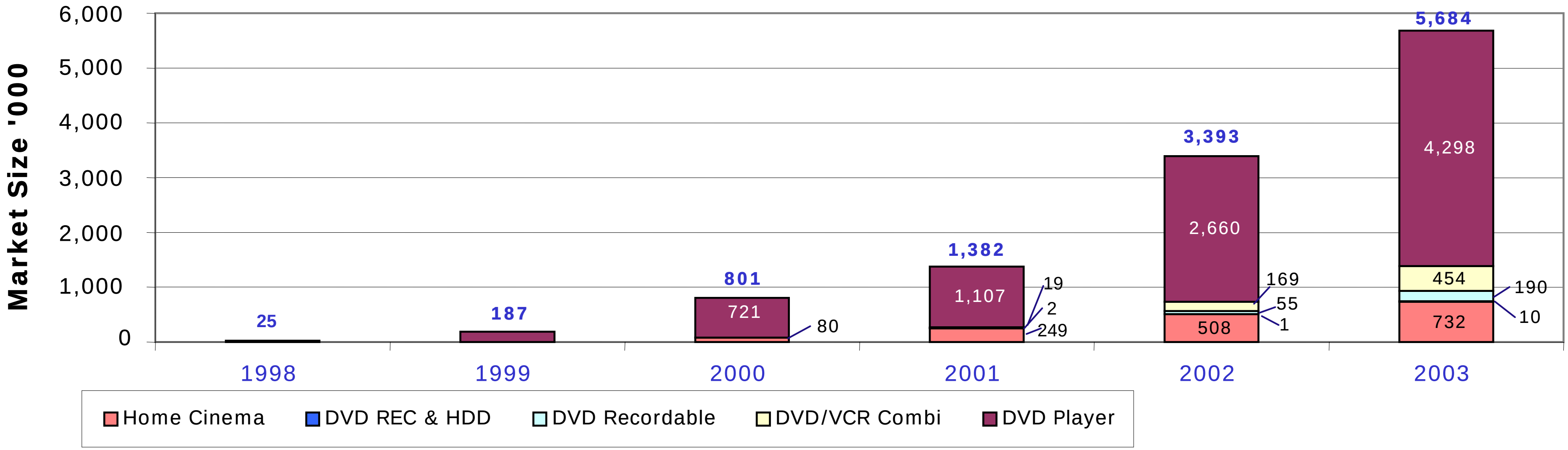


Source: Industry sources

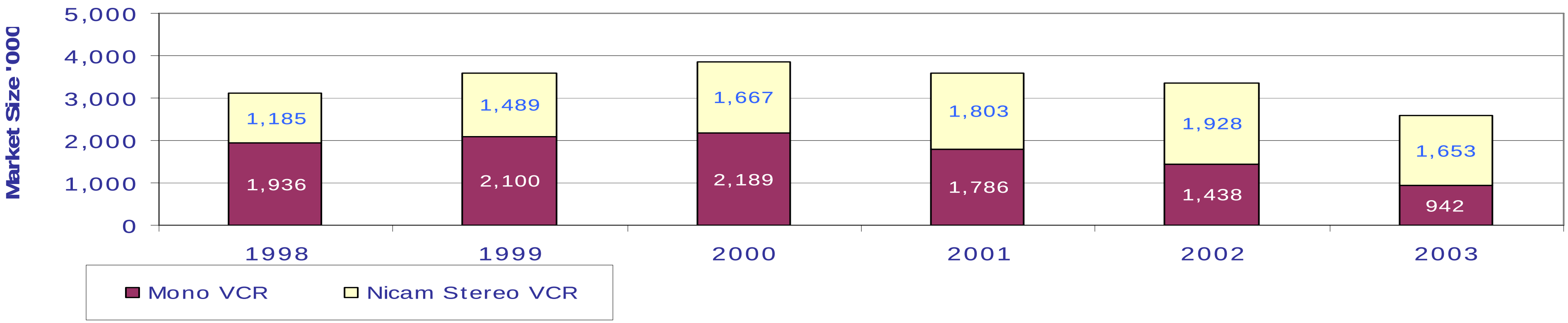
Consumers are now spending their money on flat panel TVs rather than high priced iDTVs, whose benefits they do not understand

- **The move from 4:3 to 16:9 screens is now largely complete, except at the very small screen size commodity products, and is no longer driving the market**
- **There is considerable growth in sales of expensive flat panel TV, which is allowing new manufacturers to enter the market**
  - **TV screens are moving from cathode ray tube to flat panel (liquid crystal or plasma) at all sizes**
  - **Plasma and flat panel TV sales in 2003 were 248k, a growth of 335% from 2002**
  - **These flat panels currently command a high price premium, although prices are falling by about 25% a year**
    - Average price of a large screen cathode ray screen is approximately £500
    - Average price of large screen LCD (over 21") is approximately £2,000
    - Average price of a large plasma screen is about £3,200
  - **Flat panel TV is introducing new competitors into the TV market – Dell, Taxan**
- **In comparison, iDTV sales are smaller and growing much less rapidly - iDTV sales in 2003 were 181k units, growth of 87% from 2002 and now represent about 3% of the market by volume**
- **The high price of an iDTV – which is marketed as a premium product - compared with the equivalent analogue set is likely to be off-putting**
  - **Average price of analogue set (28" CRT) at major retailer is £495**
  - **Average price of iDTV set (28" CRT) is £671 – a £176 premium, even though stand alone set top boxes retail for less than £100**
  - **The current digital premium is higher than the price of a many small analogue sets, making it unlikely there will be a move to small screen iDTV, except in premium flat panel products, until the digital premium is much lower**
- **Many consumers do not understand the benefits of digital TV over analogue TV, which is reducing uptake of iDTV**
  - **The half of all consumers are unaware of digital TV and what it means to them**
  - **However 72% recognise what Freeview is and that new technology is required to receive it**

VCR sales are now declining rapidly as DVDs have become very popular



VCR Sales



Source: industry sources

DVD-Rs and PVRs will grow rapidly as the replacement for VCRs, but few are yet digital

- **VCR sales are rapidly declining as sales of DVD players grow rapidly – 70% last year**
- **The industry now expects recording devices to move from VHS tape to DVD-R and hard disk based PVRs**
- **There is a risk that rapid uptake of analogue DVD-R/HDD recorders before 2007, which then become less useful, will contribute to consumer's negative attitudes to analogue switch-off**
- **The current digital DVD-R / PVR product range is weak but growing; there is only one DTT DVD-R and one DTT PVR on the market at present, but several in the pipeline**
- **The DTT compatible DVD-R and PVR market is likely to grow rapidly**
  - **Integration of the PVR functionality with a UK wide Digital Terrestrial 7 day EPG is likely to create clearly identifiable user benefits**
  - **Prices are likely to fall rapidly**
    - Digital technology has made it very easy for OEM producers to deliver products indistinguishable from major brands
    - This will lead to rapid commoditisation and price erosion
    - We expect to see combined digital PVR / DVD-Rs retailing at £200 by 2007

Set top box markets have become highly competitive with little margin

- The standard nature of the digital technology and lack of other barriers to entry mean that it is easy for manufacturers to enter the set top box market
- There are about 25 competing manufacturers in the UK DTT market in Q1 2004 and prices range from £39 to £139
- Margins and profits are not currently sustainable below a retail price for DTT set top boxes of £69 with current technology. Equipment on the market below this price are probably bankrupt stock or end of line clearance items
- Prices for set top boxes will continue to fall as technology advances. Industry estimates it should be possible to achieve retail pricing of very simple DTT products of £29 in 2007
- There is no retail price for satellite and cable set top boxes, but manufacturing costs are about the same as for digital terrestrial
  - Satellite and cable companies operate as vertical markets where the operator specifies and manages the distribution of product needed to receive their pay services
  - The bulk buying, managed development and limited manufacturers, together with the retail commissions that allow an artificially low sales price, make it difficult to compare to DTT STBs
  - The functionality and basic components are very similar between satellite, cable and terrestrial decoders and so the manufacturing costs should be similar

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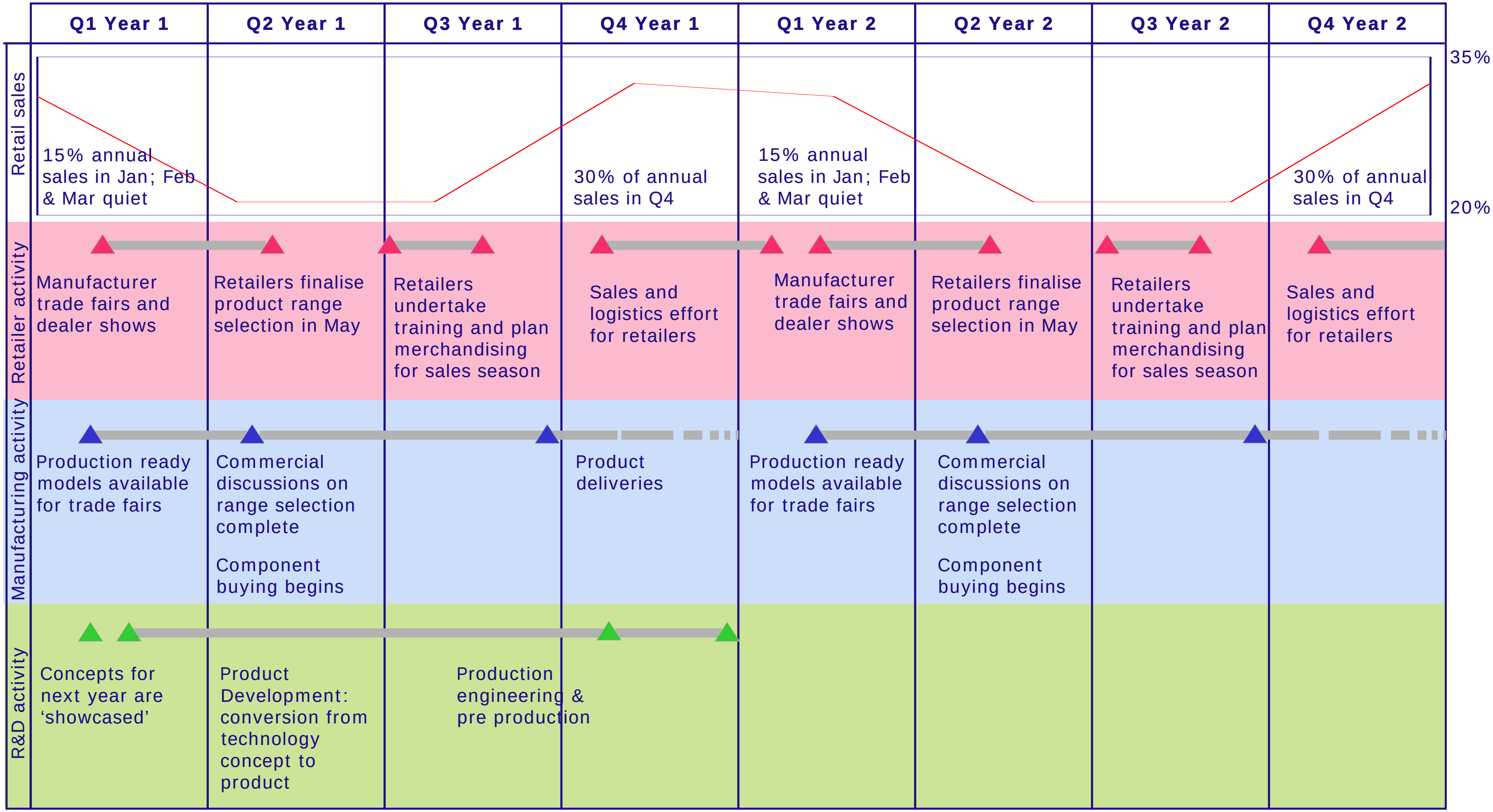
Making an announcement in Q1 2005 is optimum for retailers and manufacturers, but its impact will depend how it is communicated

- **The proposed timetable is for an announcement at the end of 2004 with analogue switch-off regionally between 2007 and 2010**
- **The optimum timing for an announcement is February or March 2005 to achieve analogue switch-off by 2010**
  - **The two year gap between the end of 2004 and 2007 is the right duration**
    - Manufacturers and retailers will need 24 months from an announcement to change product plans and migrate their product mixes to digital; a later announcement will not enable retailers to have sufficient digital products to meet consumer needs when the first regions switch analogue off in 2007
    - Any longer gap between announcement and beginning the switch-off might lessen the impetus to change
  - **The season of an announcement is important – making it in the November to January peak sales period could cause problems for retailers**
- **Delaying the announcement beyond the beginning of 2005 is likely to diminish the credibility of the UK's commitment to digital**
  - **There is some scepticism among manufacturers and retailers that the government will make an announcement prior to an election**
  - **Confidence that the UK will be a leading digital market in Europe is diminishing as other countries make their plans more concrete, for example Italy (with its new law on the media and TV which supports the announced analogue switch-off by January 2007) and Germany (which has already switched off analogue in Berlin)**
  - **However, making an announcement by the beginning of 2005 will meet expectations and re-establish credibility**
    - Fits with the already published timetable and will meet industry expectations
    - Supports the credibility being developed by the Digital Action Plan
    - Builds on credibility re-established by Freeview after the collapse of ITV Digital
- **The government should demonstrate its commitment to analogue switch-off to give manufacturers and retailers the confidence to invest in the transition**

The optimum timing for an announcement is February or March 2005 to achieve analogue switch-off by 2010

	No announcement (assumes no sudden switch off without notice)	**Announcement Oct 2004 to Jan 2005**	**Announcement Feb to Mar 2005**	**Announcement post April 2005**
Government able to meet 2007 – 2010 switch off timetable	**Unlikely**: • Industry not prepared • Product not migrated sufficiently to digital • Digital penetration of homes likely to be high for primary set but low for VCR and secondary TVs	**Likely**: • UK product management teams can justify UK specific product • DTT capability likely to be high in primary sets, growing penetration in recording devices	**Likely**: • UK product management teams can justify UK specific product • DTT capability likely to be high in primary sets, growing penetration in recording devices	**Unlikely**: • Industry not adequately prepared and insufficient Product migrated to digital • Announcement misses key decision making period for manufacturers and retailers
Retailer / Retail sales impact	• Nil. Organic market forces.	• Sales of analogue TV, DVD-R, HDD suppressed at time of announcement by adverse consumer reaction during peak selling season • Retailers can accelerate product transition to digital for 2005 sales season	• Impact of consumer reaction on sales of analogue TV, DVD-R, HDD reduced by avoiding peak sales period • Retailers can accelerate product transition to digital for 2005 sales season	• Impact of consumer reaction on sales of analogue TV, DVD-R, HDD reduced by avoiding peak sales period • Retailers not able to plan adequately for 2005 sales season
UK Manufacturing impact	• UK leadership position for DTT lost and cannot be used as justification for maintaining UK manufacturing presence • Multinationals migrate manufacturing to lowest cost locations.	• UK leadership position for DTT maintained allowing UK base for Digital TV production to be justified	• UK leadership position for DTT maintained allowing UK base for Digital TV production to be justified	• UK DTT Leadership position threatened and harder to justify maintaining UK manufacturing presence if announcement delayed beyond beginning of financial year
UK R&D Impact	• UK leadership position for DTT lost and cannot be used as justification for maintaining UK R&D presence	• UK position as DTT leader maintained allowing UK base for Digital TV production to be justified	• UK position as DTT leader maintained allowing UK base for Digital TV production to be justified	• UK DTT Leadership position threatened and harder to justify maintaining UK R&D presence if announcement delayed beyond beginning of financial year

UK manufacturers need 24 months from an announcement to develop digital products and get them into retailers’ product range



Retailers decide their product ranges many months in advance to meet manufacturing timetables, but retain flexibility in the quantities ordered

- **Manufacturers test product concepts with retailers at least a year before they are ready to be discussed as part of a retailer's product range**
- **The annual product range selection process typically begins 9 months before products are retailed**
  - **National retailers like Dixons Store Group discuss product ranges with manufacturers in February and March and finalise buying decisions in April so they can meet demand in the November to January peak**
  - **Catalogue retailers like Argos and Littlewoods select their range about 9 months ahead of publication of catalogues**
    - Items for Spring/Summer 2005 catalogue are selected in March/April 2004
    - Photography for the catalogue is done in June 2004
    - This effectively fixes the product range
- **Retailers may need less time to prepare than UK manufacturers, as they might be able to source a sufficiently wide range of digital products from foreign manufacturers who are already serving other digital market places, if UK manufacturers cannot meet demand**
- **Once the product mix is decided there is little change to the range but there is considerable flexibility in the volumes of individual product retailers can order to fit with consumer demand**
- **Retailers make orders weekly to reflect their sales and avoid build up of unwanted stock**

Manufacturers have to think ahead of the market to remain competitive and anticipate product trends and consumer demand 2 years ahead

- The seasonal sales cycle also drives the product development cycle
- Manufacturers test product concepts with retailers at least 12 months ahead and use retailer reaction to prioritise resource to new product development
- New products take about 12 months to get to production readiness. This can be longer if technology is not mature and required large amounts of new software
- By the time manufacturers demonstrate products to retailers as part of the buying cycle they will have been through pre-production to provide the samples retailers require for evaluation and testing
- Once committed to production, component lead times of up to 16 weeks (some can be 26 weeks) can limit flexibility to increase volumes
- The high capital cost of component inventory means successful manufacturers tend to run lean operations and rely on long term relationships with suppliers to cope with sudden demands

If the expected announcement is not made by Q1 2005, confidence in the government's commitment to digital switchover will be severely damaged

Impact of Scenarios for Announcement and Switch-off

Announcement Date	Period of Switch-off	Can Support Earliest Switch-off?		Impacts
Q1 2005	2007 to 2010	Retailer View	Yes	• Ideal timing; allows time to migrate product range to support digital switchover
		Manufacturer View	Yes	• Ideal timing, allows time to develop and migrate product range to support digital switchover
Q2 or Q3 2005	2007 to 2010	Retailer View	Yes	• Timing not ideal as focus is now on managing the business in preparation for the sales season. This includes finalising manufacturer negotiations, staff training, etc
		Manufacturer View	No	• Will be able to migrate some products but not have a full TV or DVD-R/PVR range available for retail • Digital Action Plan credibility reduced & confidence in government commitment to digital switch-off reduced
Q4 2005	2007 to 2010	Retailer View	Yes	• Retailer focus on maximising sales opportunities during the 2005/6 sales season
		Manufacturer View	No	• Will be able to migrate very limited product to be digital capable • Digital Action Plan credibility reduced & confidence in government commitment to digital switch-off reduced
Q1 2006	2008 to 2011	Retailer View	Yes	• Right time of year, but were expecting announcement 12 months earlier and so will need more persuading
		Manufacturer View	Yes	• Provides a 2 year product development window, but is 12 months later than expected. So will be less confident and need more evidence of government commitment to invest in product development

The government should demonstrate its commitment to analogue switch-off to give manufacturers and retailers the confidence to invest in the transition

- Our interviews revealed much cynicism among retailers and manufacturers about the government's willingness to make a decisive announcement and to follow through
- Manufacturers will only invest in creating digital products if they believe the switch-off will really take place
  - It will require significant investment to migrate product ranges to digital capability
  - The UK will be competing with the rest of Europe in the product plans of the major multi-national consumer electronics companies
  - If the government's announcement is equivocal or has caveats they are unlikely to begin digital product development in earnest
- Retailers will only start to order and promote the higher priced digital product lines if they believe the consumer market will develop
- The government could demonstrate its commitment by:
  - Publishing a clear plan for switch off, including details of the regional roll-out, support details for those disadvantaged as a result of analogue TV switch off
  - Starting the process for upgrading its own TV stock (schools, hospitals, prisons, MoD etc) in preparation for analogue switch off. The Italian government lent credibility to its announcement by ordering one million set top boxes, for instance
  - Creating and announcing a detailed communications plan for consumers

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Consumers face a period of uncertainty about how an announcement affects them and how they should react to it, which makes forecasting difficult

- **There an average of 2.3 TV per household and 1.5 VCR per household. Decision making for households with multiple sets is more complex than for those with just one TV and VCR**
- **There are many different upgrade paths and there is not one commonly held view of how customers will react to an announcement**
- **In modelling the impact of analogue switch-off, we have born in mind the scenario below**

Scenario for Customer Behaviour

Single TV households

- Has Sky / cable box
  - Likely to be persuaded to upgrade to Sky / cable PVR +
  - No need to worry about transition
  - May want a separate DTT PVR but not a switch over issue
- Has DTT STB
  - If old TV may upgrade to iDTV
  - May be tempted to buy DTT PVR
- Has analogue only
  - Likely to get STB only
  - May upgrade TV to iDTV/PVR within 12 months depending on wealth

Two TV households

- Has Sky / cable PVR+ box
  - No need to worry about transition for main TV
  - May want a separate DTT PVR but not a switch over issue
  - May want DTT STB for 2nd TV
- Has DTT STB
  - If old TV likely to upgrade to iDTV and move STB 2nd set
  - May be tempted to buy DTT PVR
- Has analogue only
  - Likely to get STB only
  - May upgrade to iDTV/PVR within 12 months depending on wealth

Multiple TV households

- Has Sky / cable PVR + box
  - No need to worry about transition for main TV
  - May want a separate DTT PVR but not a switch over issue
  - May further DTT STB for 2nd TV
- Has DTT STB
  - If old TV likely to upgrade to iDTV and move STB 2nd set
  - May be tempted to buy DTT PVR
- Has analogue only
  - Likely to get STB only
  - May upgrade to iDTV/PVR within 12 months depending on wealth

The key issue for retailers and manufacturers is whether consumers choose an iDTV or a route requiring a set top box to upgrade their primary TVs

Consumer Options for Upgrading Primary Analogue Sets

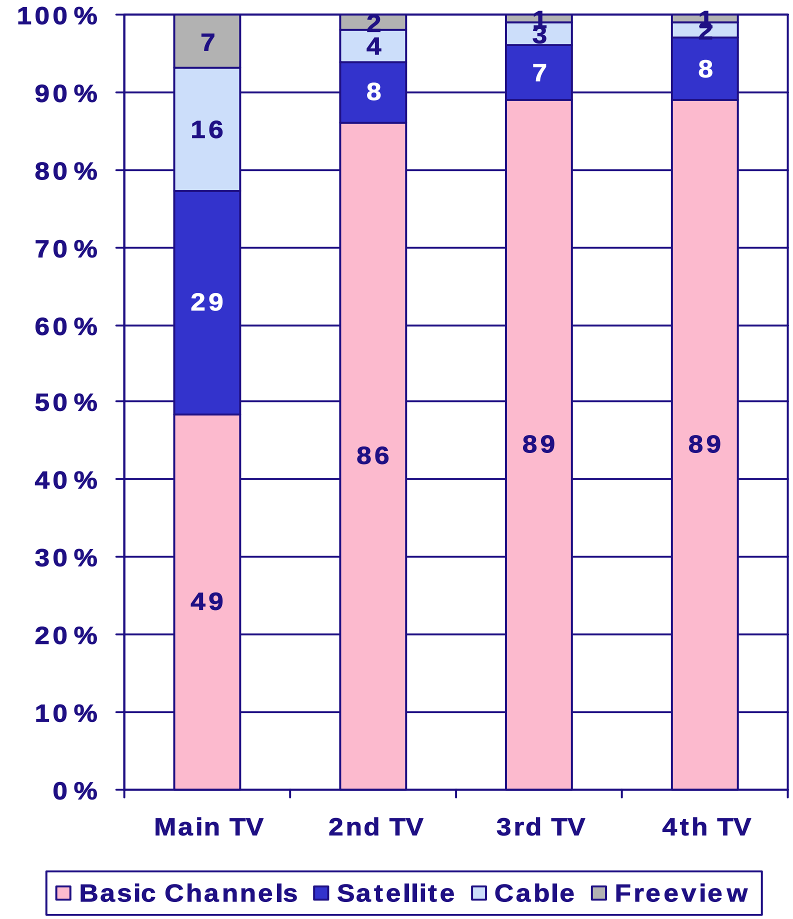
Platform Choice	Receiver Options	Aerial Options	Notes
Digital Terrestrial	Purchase iDTV ***or*** Purchase STB	• May have to upgrade aerial to receive DTT transmissions • Less likely to need aerial upgrade if want only to receive main Public Service Broadcasting channels (transmitted at a higher power than other DTT channels)	• Purchase iDTV at about 10 times the cost of a STB • After switch-off, DTT coverage may not reach some areas that currently receive analogue terrestrial
Digital Cable	Set top box provided by cable company as part of subscription	• N/A	• Cable only available to about 40% of UK homes
Digital Satellite (subscription)	Set top box provided by cable company as part of subscription	• Requires satellite dish & LNB to be installed. Provided as part of the package deal	• May not be able to receive if not in line of sight to satellite • May not be able to receive if part of a communal antenna system or if planning restrictions
Digital Satellite (Free to Air)	Purchase STB	• Requires satellite dish & LNB to be installed.	• May not be able to receive if not in line of sight to satellite • May not be able to receive if part of a communal antenna system or if planning restrictions
No longer watch TV	N/A	• N/A	• 6% of households say they would not upgrade according to a survey by Generics, however we believe this is unrealistically high

Assumption: Primary set is connected to a rooftop aerial

Consumer behaviour is likely to be significantly different for secondary sets, which tend to be smaller, older, and not connected to subscription services

- **DTT Option**
  - IDTV purchase expensive and may not be available in small screen size in early years
  - Even set top boxes (£79 currently on average) are expensive compared to small screen TV (£80)
  - Requires aerial feed via amplifier or splitter. Many small screen TVs use set top aerials which may not be suitable for DTT
- **Satellite Option**
  - Second decoder & subscription required (but charged at less than initial subscription)
- **Cable Option**
  - Second decoder & subscription required

Multichannel Penetration For TV Sets (2003)



Source: GFK

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Retailers need time to prepare for analogue switch off but we forecast it could bring them additional revenue of £2.4 billion between 2005-2010

HEADLINES

- Major retailers need time to prepare for the discontinuity in the market an announcement will bring
- Independent retailers are important in making a smooth transition from analogue to digital TV but face similar lead-time constraints as retail majors
- Opta has modelled two scenarios, one with no analogue switch-off and one with an announcement in 2004 and total switch-off in 2010
- An announcement would provide retailers with increased revenues of approximately £2.4 billion over the period 2005-2010

Major retailers need time to prepare for the discontinuity in the market an announcement will bring

- **An announcement by government will create a discontinuity in the consumer market that retailers need to be prepared for:**
  - Demand for analogue products could drop suddenly. It may recover and retailers could 'bundle' set top decoders with analogue products to maintain sales. Retailers have not yet worked through scenarios and will not do so until the government's position is clear
  - Demand for digital products could rise suddenly leading to stock shortages that take time to address
  - There will be pressure on both retail staff and retailer help lines from customers who have just completed purchases of analogue product but would have made a different purchase decision if they had known about analogue switch off
  - There will be customers who buy digital equipment after an announcement but who will be out of coverage until switch over.
- **Retailers will need time and very clear communication of what is happening, when and by whom in order to organise themselves nationally for:**
  - Staff training
  - Advising customers
  - In store material
  - Product and procurement planning
  - Advertising and promotions
- **The major electrical multiples account for about 75% of all televisual products sold and most operate nationally with the same point of sale material and training nationally. A regional approach to analogue switch off increases the risks of confusion in the retail channel and puts pressure on their organisations**

Independent retailers are important in making a smooth transition from analogue to digital TV but face similar lead-time constraints as retail majors

- Independent retailers account for 25% of UK consumer equipment sales
- Digital TV has been a successful area for independent retailers over recent years
  - They have acquired greater knowledge of the advantages and pitfalls
  - Local knowledge has helped develop the accuracy of their advice to customers in a way that is more difficult for the major retailers
  - They have also developed relationships with local aerial installers to provide a complete service
- A significant number of independent retailers get an important part of their revenue from rental services.
- Cessation of analogue TV broadcasts may strain cash flow from their rental business if they do not plan equipment replacement carefully
- About 50% of independent retailers belong to RETRA (11,500 members)
  - About 50% belong to the Combined Independent Holdings (Euronics) buying group
  - Manufacturers are forcing more small retailers to use buying groups by increasing the turnover customers must reach to deal direct
  - The buying groups face the same product planning issues as major retailers

Opta has modelled two scenarios, one with no analogue switch-off and one with an announcement in 2005 and total switch-off in 2010

"Base case" – no announcement, no switchover[1]	Analogue switch-off scenario – announcement in Q1 2005[2]
• No announcement – no switchover to digital transmission • Long term DTT penetration on primary sets: **26%.** On secondary sets: **16%** • **22%** of primary TV-sets and **62%** of secondary sets are still analogue by 2010 • **35%** of all TV-sets are digital by pay-TV by 2010 • **6.0m** TV-sets are being sold per annum on average during the period 2005-2010 • By 2010, **41%** of all sets sold are iDTVs • Product mix gradually moving from CRT to flat panel TV-set – in 2010, **61%** of all sets sold are flat-panel • Few recorders will be digital enabled initially • Pricing of recorders will decline rapidly as technology develops and greater variety becomes available	• Announcement in Q1 2005 • Long term DTT penetration on primary sets: **47%.** On secondary sets: **63%** • **All** TV-sets are digital by 2010 • **44%** of all TV-sets are digital by pay-TV by 2010 • **6.3m** TV-sets are being sold per annum on average during the period 2005-2010 • By 2010, **98%** of all sets sold are iDTVs • The move to flat panel sets is accelerated leading to **69%** of all sets sold being flat panel in 2010 • 100% of recorders will have an integrated digital tuner from 2006 and forwards • Pricing for digital recorders will initially be higher due to a higher proportion having an integrated digital tuner. It will have converged to analogue pricing by 2010

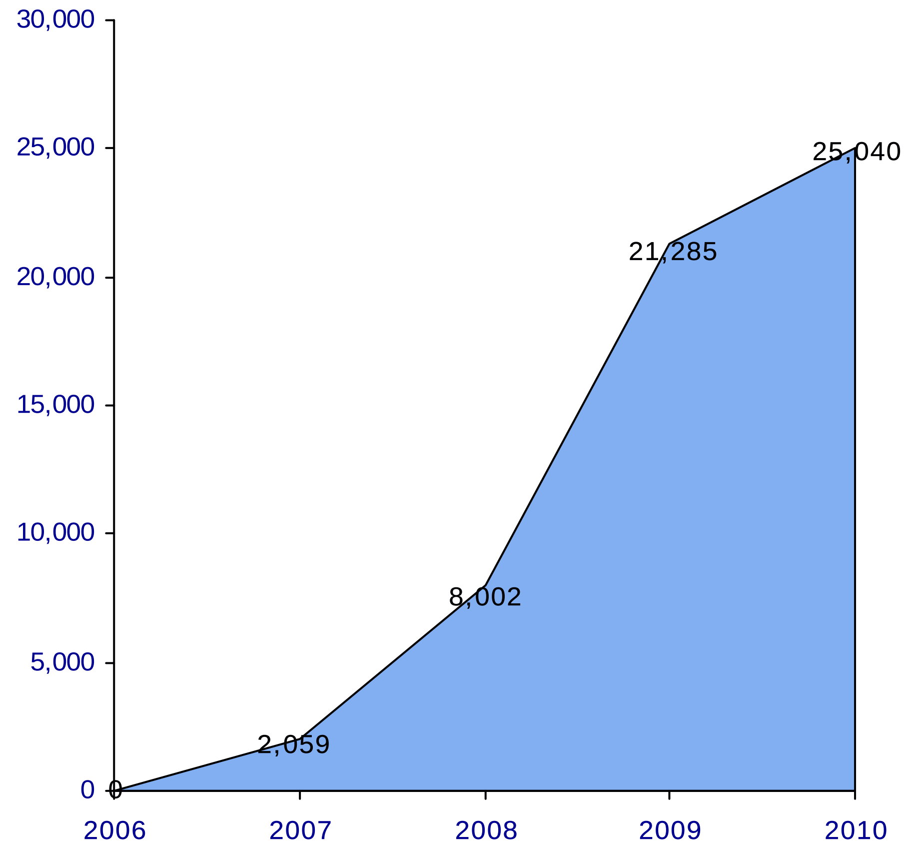
Notes:
1) Source: Opta assumptions based on interviews with retailers and manufacturers
2) Source: Opta assumptions based on interviews with retailers and manufacturers, forecasts from industry and Intellect

To forecast demand, we assume analogue switch-off will be phased by TV region with 2009 as the key year with 50% of UK households being turned off

Assumed Switch Off Schedule by TV-area[1]

Year	Areas switched off	Total homes covered	% of UK homes
2007	• Scotland	• 2,059	• 8.5%
	Total	**2,059**	**9%**
2008	• Yorkshire	• 2,473	• 9.9%
	• Wales and The West	• 1,987	• 7.9%
	• Tyne Tees	• 1,186	• 4.7%
	• Border	• 297	• 1.2%
	Total	**5,943**	**24%**
2009	• London	• 4,860	• 19.3%
	• Central	• 3,793	• 15.1%
	• Granada	• 2,830	• 11.5%
	• Anglia	• 1,800	• 6.9%
	Total	**13,283**	**53%**
2010	• Meridian and Channel	• 2,407	• 9.5%
	• West Country	• 739	• 3.0%
	• Ulster	• 609	• 2.5%
	Total	**3,755**	**15%**

Cumulative Households Switched Over[1]

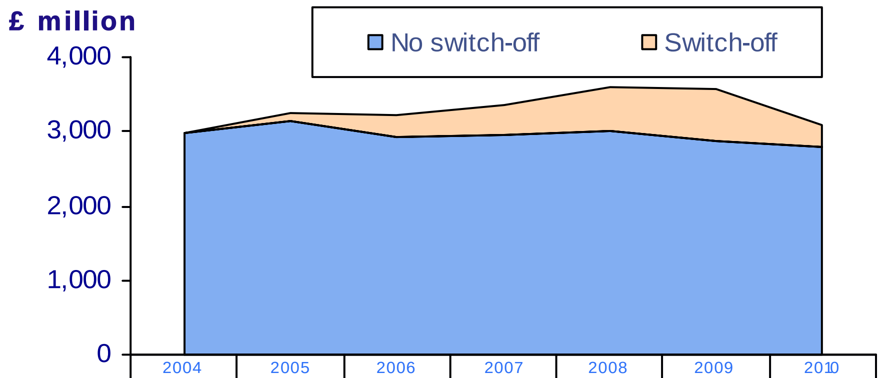


Notes: 1) Source: BARB/IPSOS-UK establishment survey Jun 2003 and Opta assumptions

An announcement would provide retailers with increased revenues of approximately £2.4 billion over the period 2005-2010

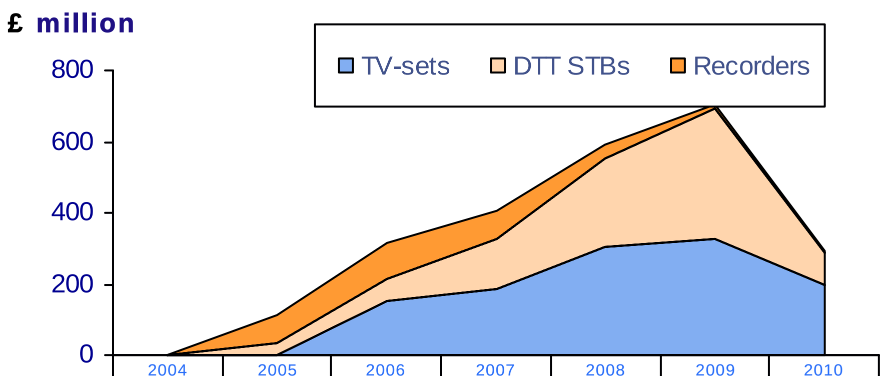
Total Sales Value

TV, Recorders, STBs



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	114	316	406	594	706	292
No switch-off	2,972	3,131	2,918	2,949	3,006	2,871	2,797

Added Sales Value by Product



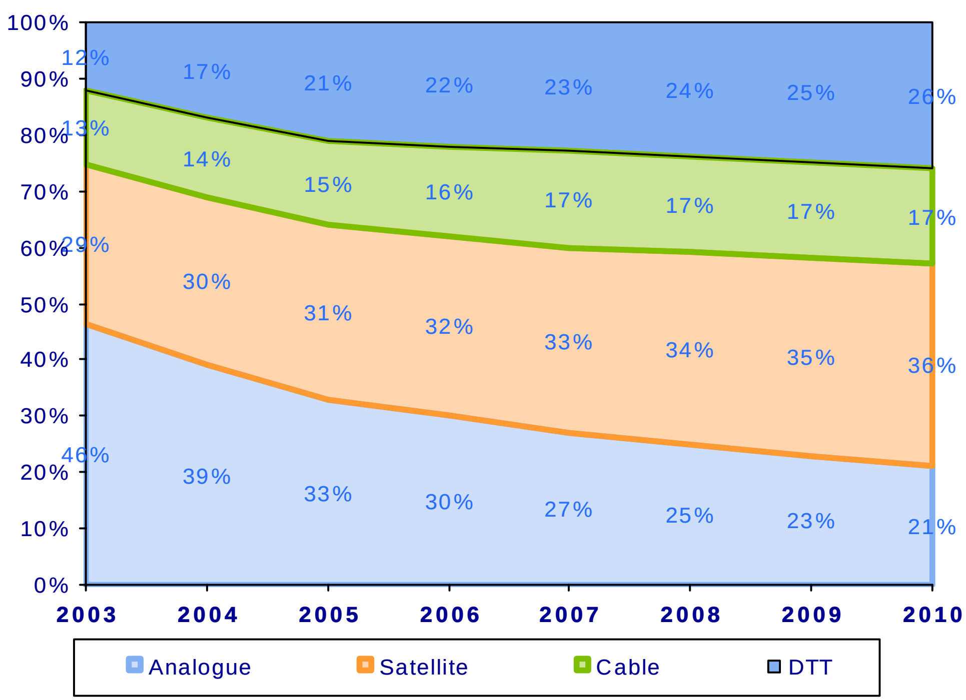
	2004	2005	2006	2007	2008	2009	2010
Recorders	0	77	102	79	42	10	6
DTT STBs	0	36	62	141	246	366	90
TV-sets	0	0	152	187	306	329	196

- **An announcement about digital switch-over is estimated to increase retailers revenues by approximately £2.4 billion over the period 2005-2010, leading to increased cumulative gross margins of £730 million**
- **This is equivalent to a 10% increase in total sales and gross margin of these products over the period**
- **The main benefit to retailers will come from increased turnover in the TV-set market as customers become more likely to change their TV-sets when forced to go digital**
- **This is followed closely by a sharp spike in the sales of DTT STBs during the period when the analogue signal is switched off and viewers are forced to go digital on both primary and secondary sets**

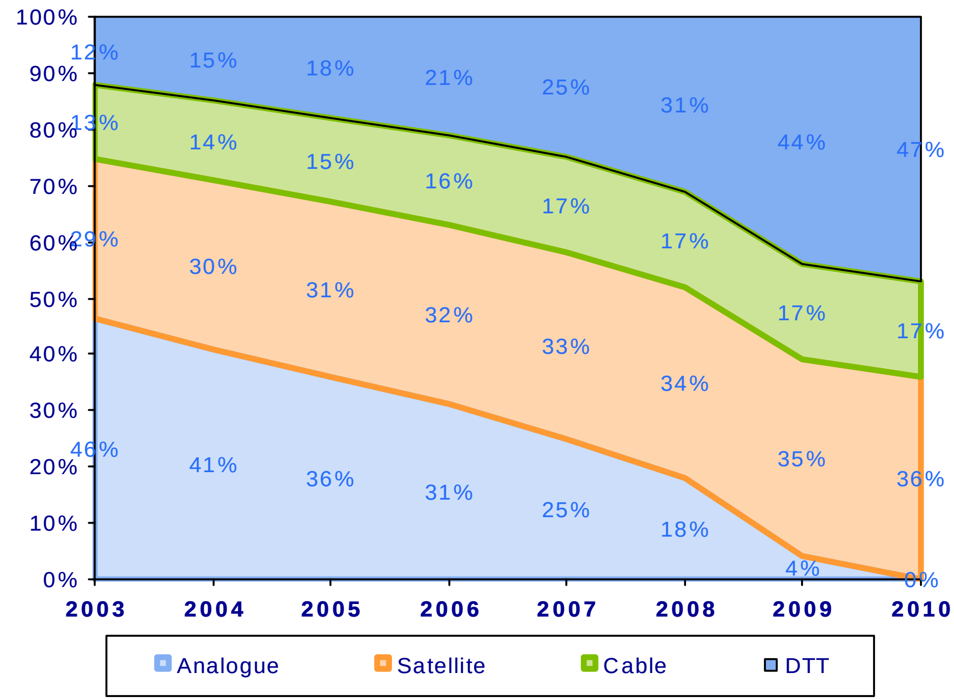
In terms of penetration rates, the switch-off scenario will lead to 47% of all primary sets receiving television through DTT

Digital Penetration , Primary Sets

No analogue switch-off



Analogue switch-off, announcement in 1Q 2005

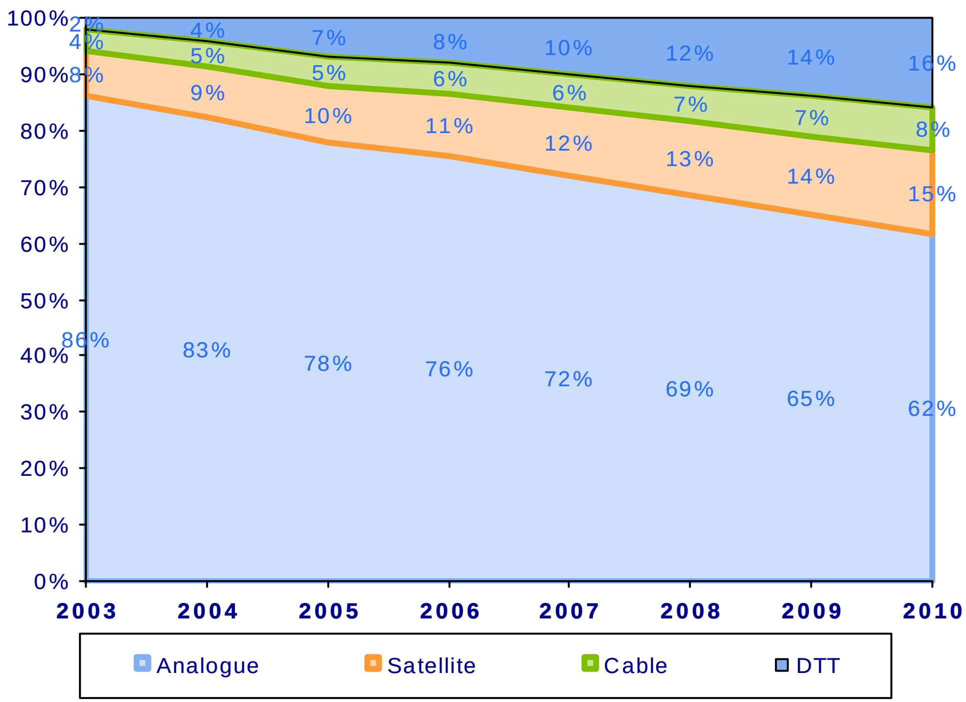


Notes: 1) Source: Opta assumptions based on interviews with retailers and manufacturers, forecasts from industry and Intellect

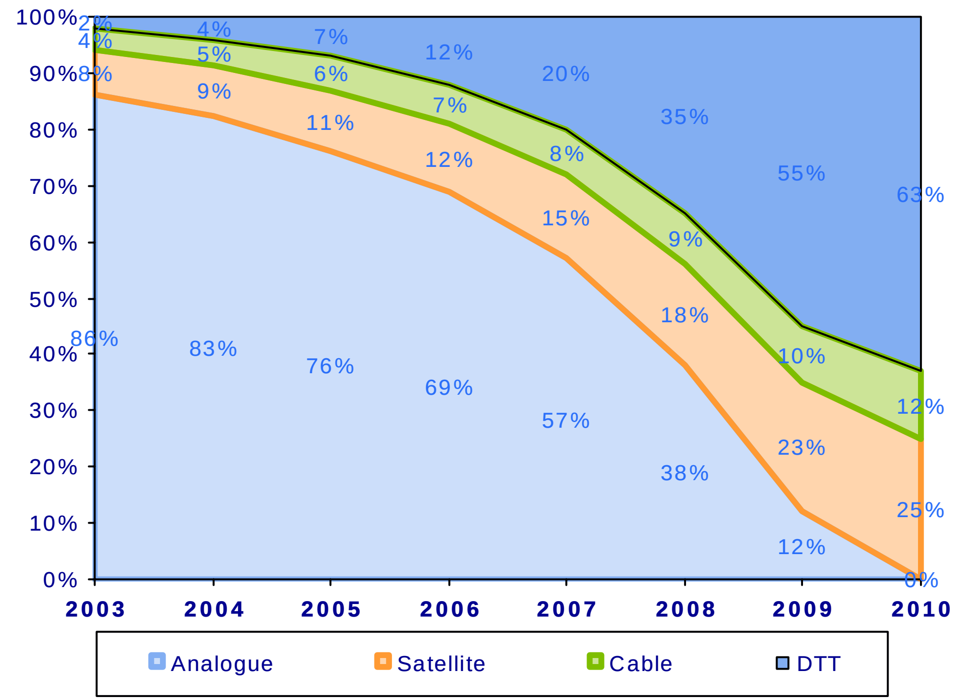
We believe most secondary sets will be digitalised through DTT rather than pay-TV as few secondary sets currently have subscription services

Digital Penetration , Secondary Sets

No analogue switch-off



Analogue switch-off, announcement in 2004

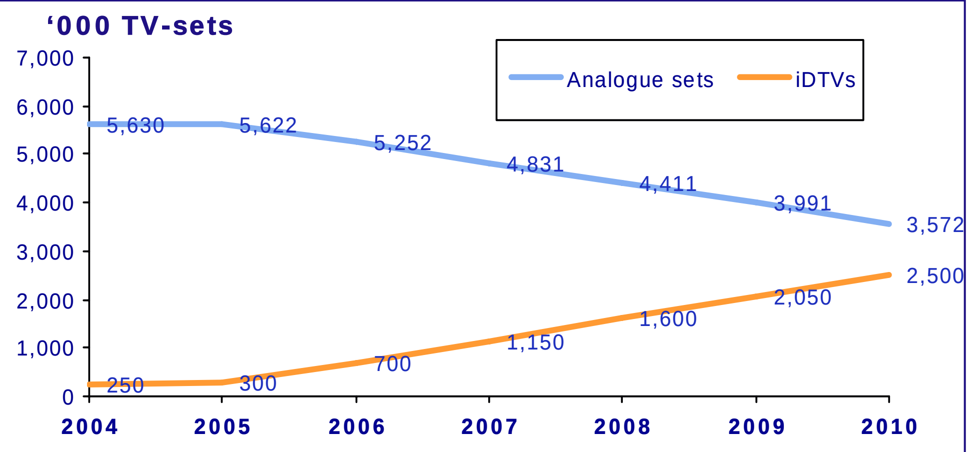


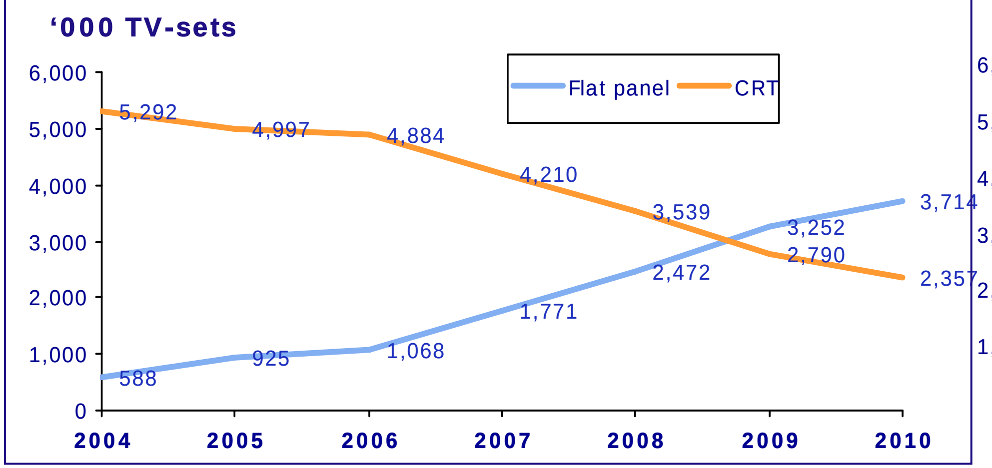
Notes: 1) Source: Opta assumptions based on interviews with retailers and manufacturers, forecasts from industry and Intellect

Analogue switch-off will stimulate demand for iDTVs and may have a small positive impact on purchases of more high-end, flat-panel sets

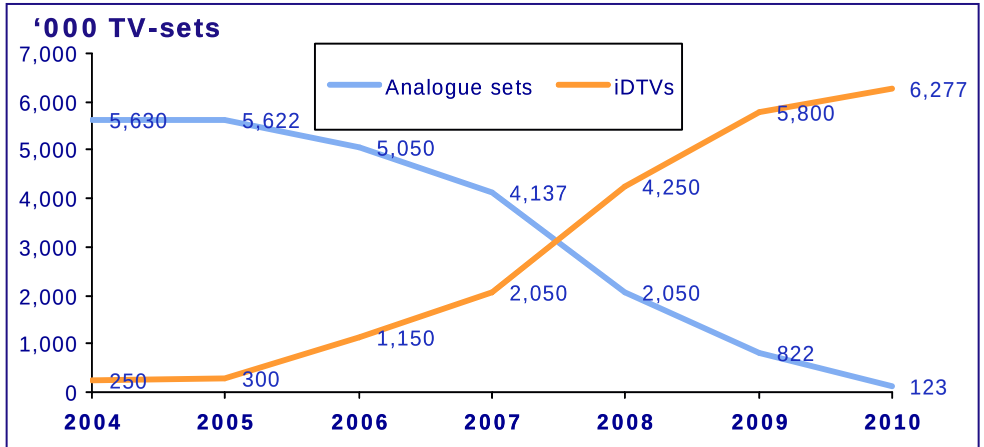
Sales of TV-sets by Type

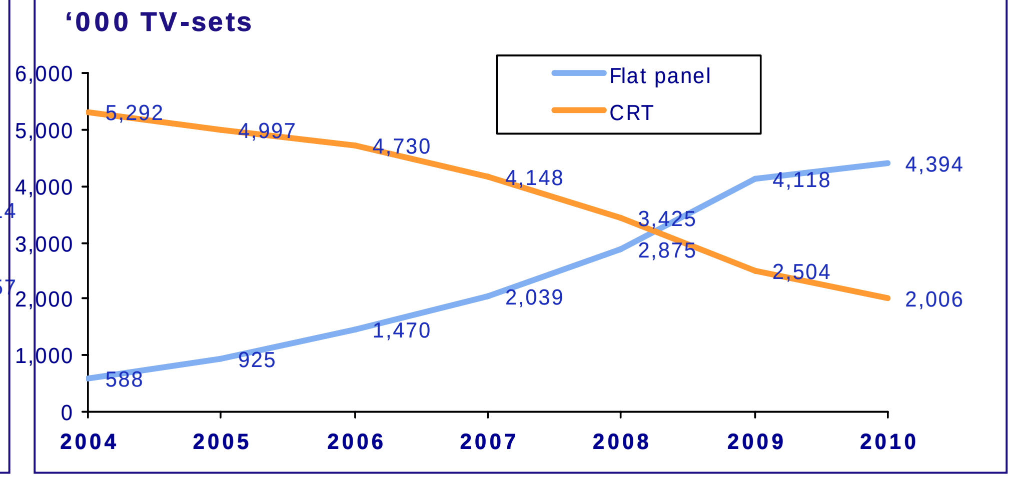
No analogue switch-off





Analogue switch-off, announcement in 2005

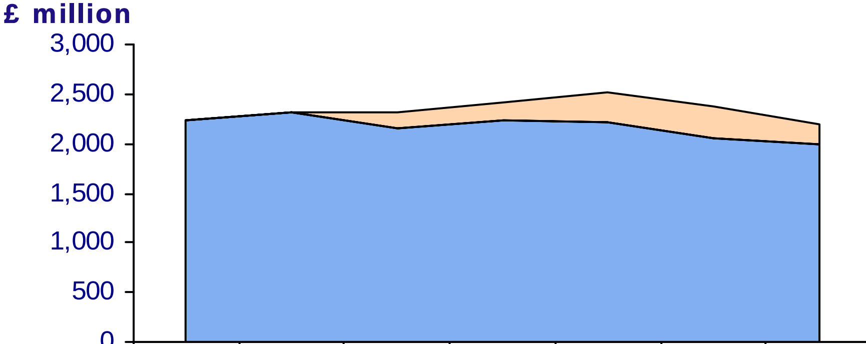




Notes: 1) Source: Opta assumptions based on interviews with retailers and manufacturers, forecasts from industry and Intellect

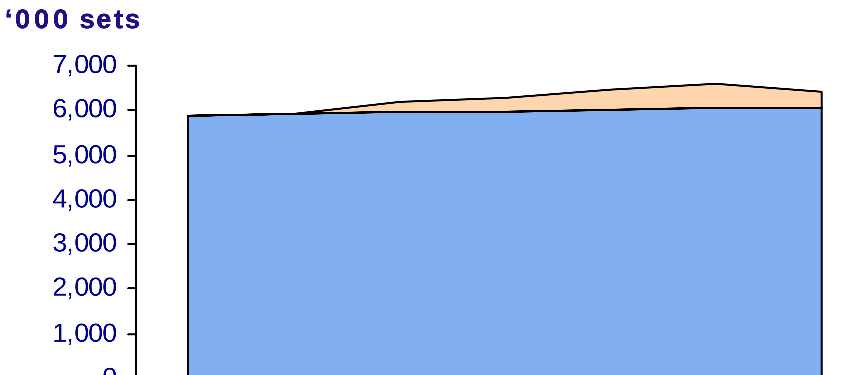
The value of TVs retailers sell could be increased significantly if customers react to an announcement by upgrading their TV sets more quickly

Total Sales Value, TV Sets



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	0	152	187	306	329	196
No switch-off	2,241	2,312	2,157	2,238	2,216	2,056	1,999

Total Volume of TV Sets Sold



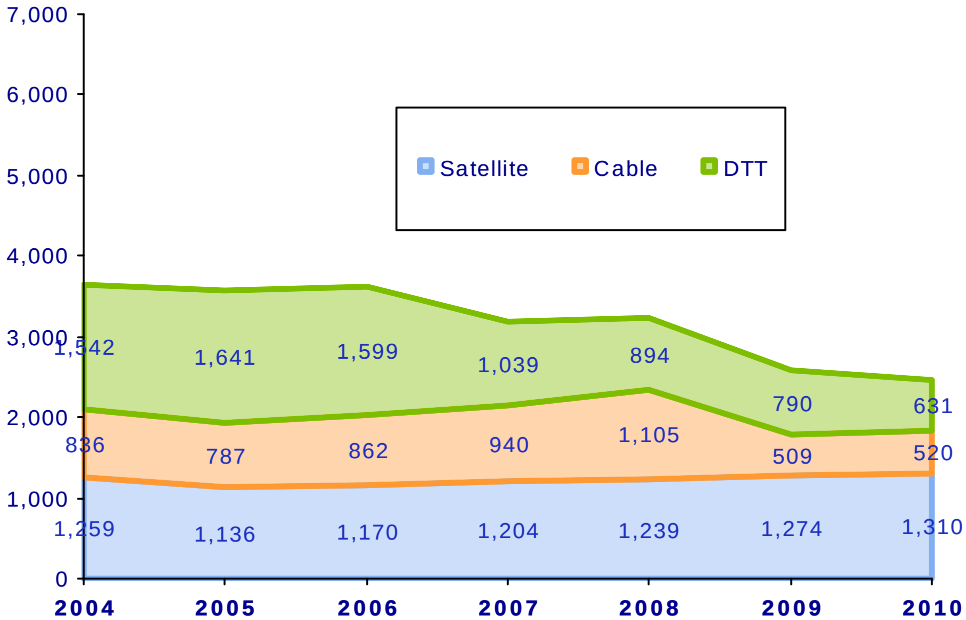
	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	0	248	306	439	559	328
No switch-off	5,880	5,922	5,952	5,981	6,011	6,041	6,072

- An announcement would have two positive effects for retailers:
  - Higher average value of TV-sets sold
  - More TV-sets sold
- An announcement would benefit retailers by in increase the replacement rate of TV-sets with more high-end, iDTV sets, as consumers are more likely to upgrade to flat-panel TV-sets at the same time
  - Average price per TV-set sold in No switch-off case: £357
  - Average price per TV-set sold in switch-off case: £376
- The average extra revenue from sales of TV-sets for retailers would be £200 million per annum for the period 2004-2010, for a total of £1.2 billion
- Over the period, an extra 1.6 million sets would be sold in the Switch-off case
- Over time, the total value of the market would decline due to technology becoming cheaper and prices coming down
- Taking the average gross margin for retailers of 30%, retailers will make an average extra gross margin of £60 million per annum under the switch-off case
- The total value of this over the period 2005-2010 would be approximately £370 million, equivalent to a 10% increase in gross margin from sales of TV-sets over this period

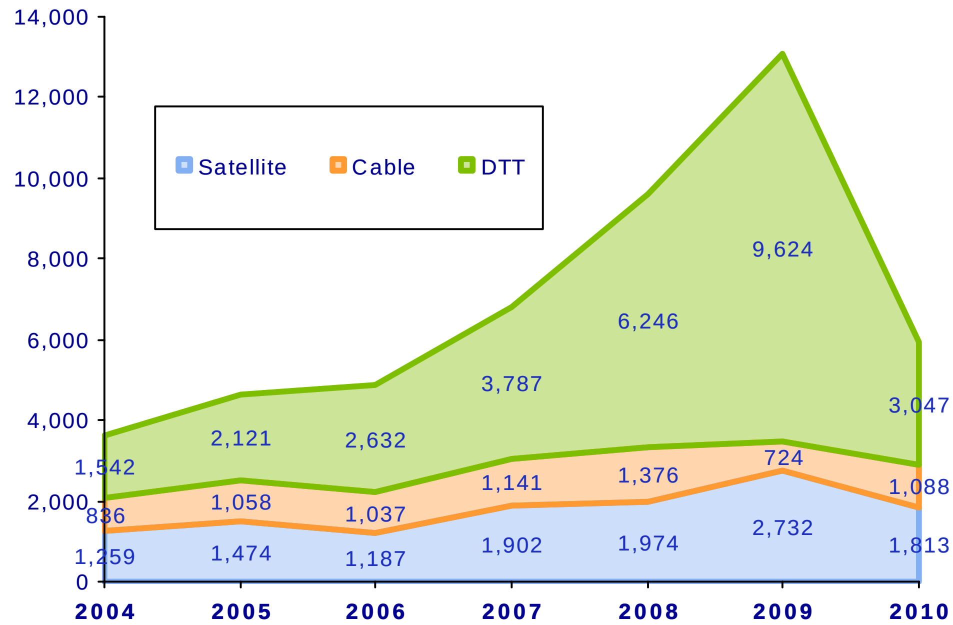
Analogue switch off will drive a major increase in set top box sales to convert analogue TV-sets and, marginally, to convert VCRs

Volume of sales, STBs

No analogue switch-off



Analogue switch-off, announcement in 2004

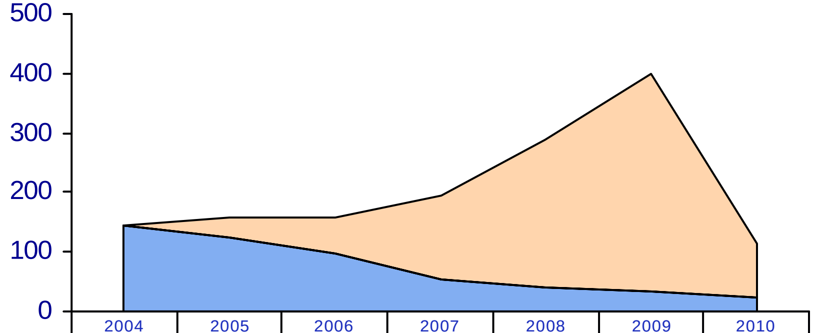


Source: Opta assumptions based on interviews with retailers and manufacturers, forecasts from industry and Intellect

Analogue switch-off will create a major increase in the value of DTT set top boxes sold as many viewers are likely buy them to move to digital

Total Sales Value, DTT STBs

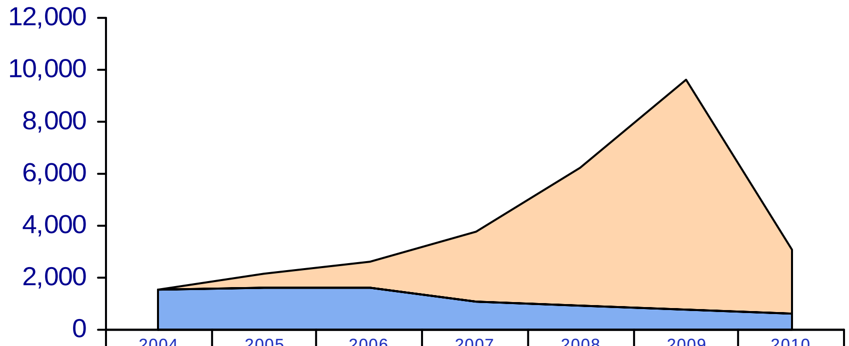
£ million



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	36	62	141	246	366	90
No switch-off	145	123	96	53	41	33	24

Total Volume of DTT STBs Sold

'000 sets



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	480	1,033	2,748	5,352	8,834	2,416
No switch-off	1,542	1,641	1,599	1,039	894	790	631

- **The average price of DTT STBs is likely to come down strongly over the period, but the large volumes that a switch-over will bring will more than compensate for this**
- **In the no-switch-off case, customers are more likely to only upgrade to Freeview when they decide to buy a new TV-set and so are more likely to buy an iDTV set when they make this decision**
- **The total cumulative additional revenue from selling set-top boxes in the switch-off scenario is £940 million over the period 2005-2010. The equivalent number for gross margin is £280 million, given retailers average gross margins of 30%**

Technological change unrelated to analogue switch-off is driving recorders. However, if they need digital capability, price erosion will be delayed

VCR developments and assumptions

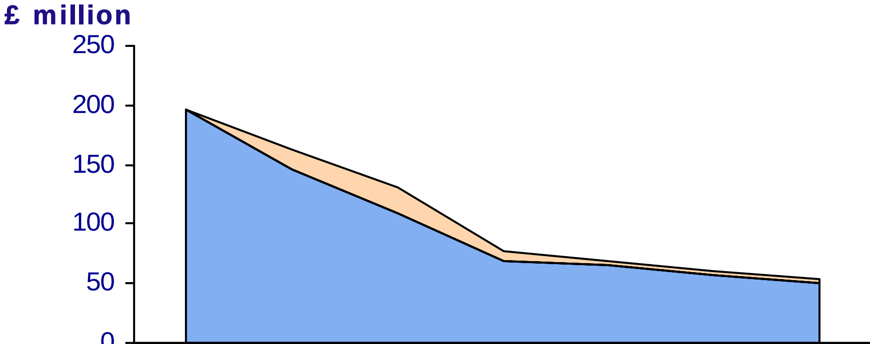
- Most customers will move from VCR to R-DVD in the coming years, regardless of any developments in DTT. An announcement will have little impact on the volumes of product purchased
- In all cases the installed base of VCRs will shrink from approximately 35 million units currently to 21 million units by 2010, through natural retirement of equipment and replacement with R-DVDs
- If analogue switch-off is announced, we assume all VCRs sold from 2006 onwards will have a digital tuner built in. The end-result is that 11% of all VCRs in use by 2010 will have an integral digital capability with a further 9% assumed to be digitalised through an STB. If no announcement is made only 11% of the VCR base will be digital enabled by 2010
- A proportion of STBs sold to digitalise TV-sets are likely to have dual tuners built in, enabling more VCRs to record digital signals than the above case indicates

R-DVD and PVR developments and assumptions

- An announcement would likely force retailers to offer more DTT enabled product, leading to less rapid price erosion for R-DVD and PVR products
- The installed R-DVD and PVR base is relatively small, leading to little need for STBs to digitally enable them

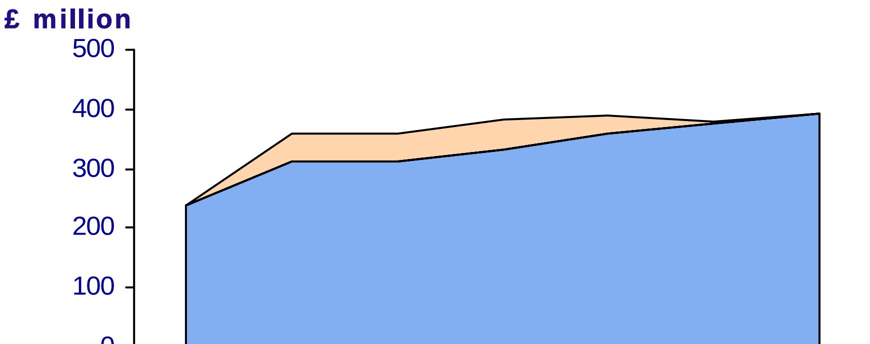
For VCRs and R-DVDs, volumes will not differ because of analogue switch-off, although we expect a small impact on pricing and values

Total Sales Value, VCRs



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	17	21	9	4	3	3
No switch-off	197	146	109	69	65	58	51

Total Sales Value, R-DVDs



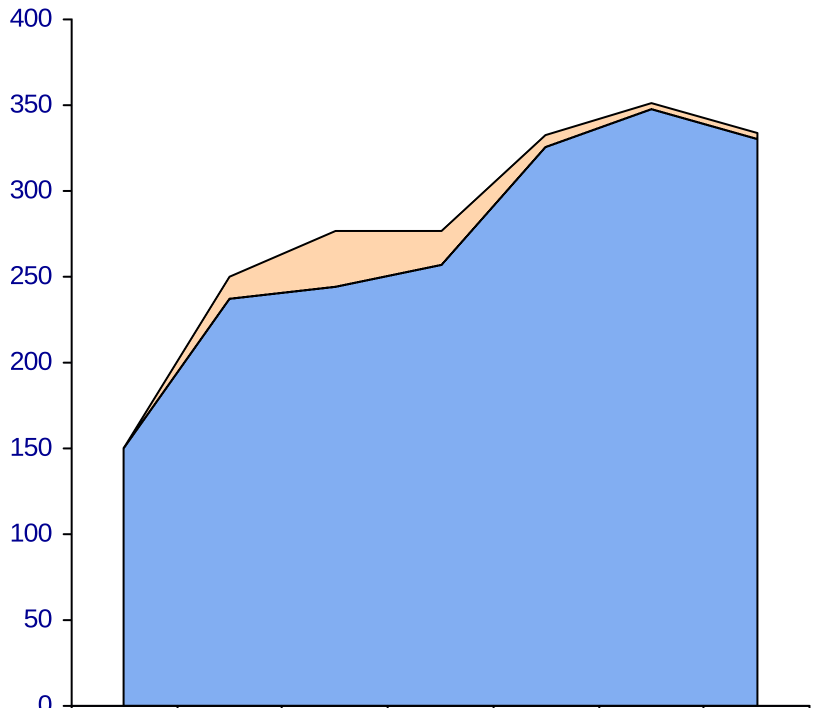
	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	48	48	51	32	4	0
No switch-off	239	311	312	332	358	376	393

- **Volumes will not differ much between the two cases, as customers' buying behaviour is driven more by technology and pricing developments**
- **For VCRs, the cumulative revenue effect of an announcement over the period 2005-2010 is £57 million (with some additional STB sales on top). This gives an additional gross margin of £17 million to retailers**
- **For R-DVDs, the cumulative revenue effect of an announcement over the period 2005-2010 is £183 million, (with some additional STB sales on top). This gives an additional gross margin of £55 million to retailers**

For PVRs, volumes will not differ between the cases, although pricing might

Total Sales Value, PVRs

£ million

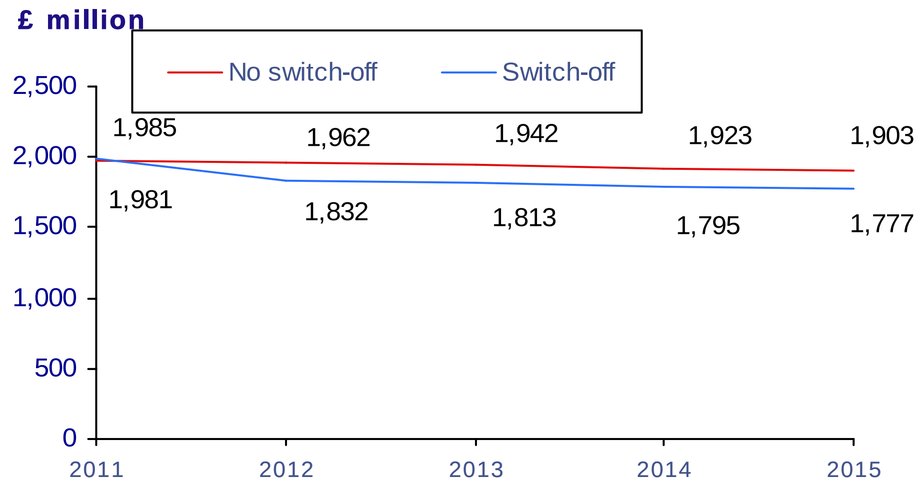


	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	13	33	20	6	3	3
No switch-off	150	238	244	257	326	348	331

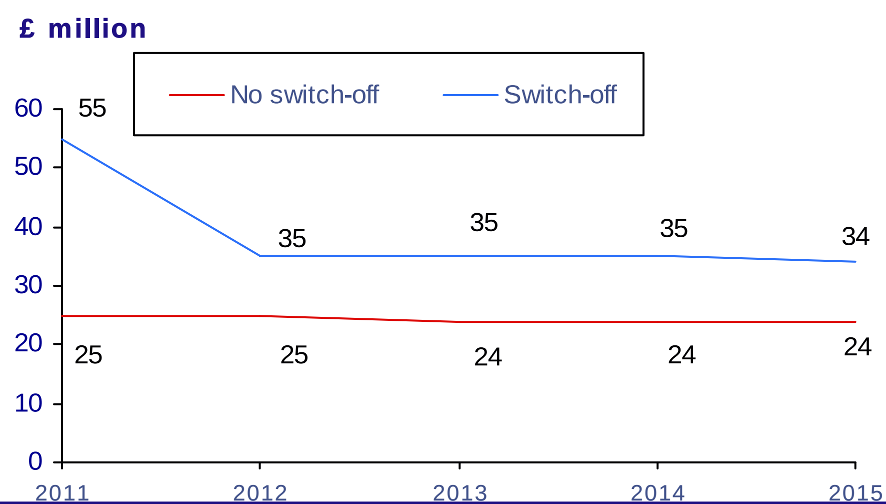
- **For PVRs, the cumulative revenue effect of an announcement over the period 2005-2010 is £77 million. This gives retailers an additional gross profit of £23 million**
- **The driving factor behind the PVR market is a rapid decline in pricing. In the case of an announcement, price erosion will be delayed, as more product with an integrated digital tuner will be sold**
- **For all recorders, we assume that retailers can pass the cost of the integrated digital tuner on the customers without any decrease in volumes sold. If customers are not willing to pay for this, more non-integrated product may be sold. In this case, an announcement will have little impact**

Switch-off is likely to reduce retailer revenues by about £440m in the years immediately following switch-off

Total Sales Value 2011-2015: TV-sets



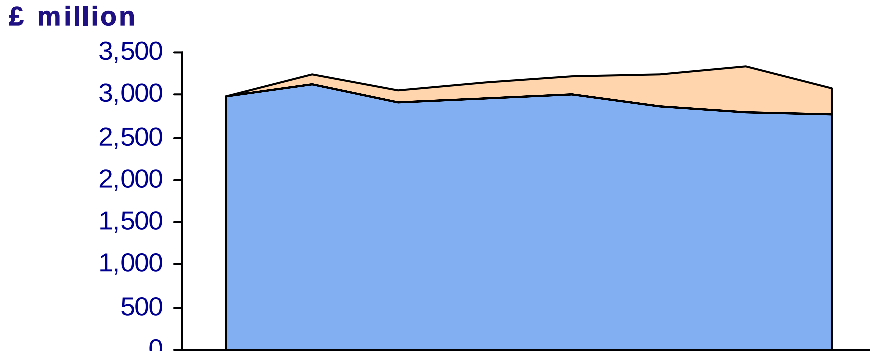
Total Sales Value 2011-2015: DTT STBs



- **Switch-off is likely to increase sales of TV-sets and other equipment during the switch-over period, some of it brought forward from following years**
- **Sales of TV sets are likely to be reduced in the years immediately after 2010 if switch-off goes ahead**
- **The additional 1.6 million TV sets sold in 2005-2010 would likely reduce the average life-length of television sets and reduce volumes and revenues in 2011-2015 by approximately £510 million (about 20% of the additional, non-discounted sales during 2005-2010)**
- **This reduction would be slightly offset by an increased market for replacement DTT STBs. This gain could be £72 million between 2011 and 2015 in the "switch-off" case**
- **The net revenue lost to retailers would be £440 during 2011-2015**

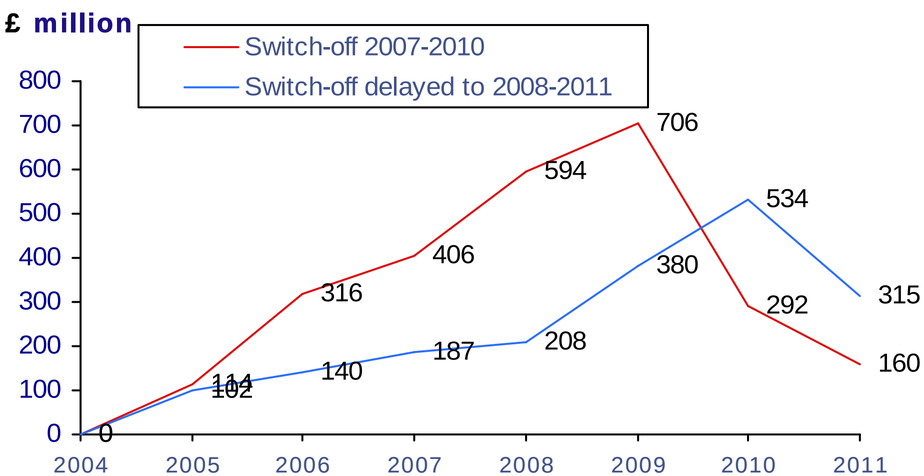
A delay of one year in switch-over would reduce the additional revenues to retailers over the switch-off period by £500 million to a total of £1.9 billion

Total Sales Value – switch-off delayed to 2008-2011
TV, Recorders, STBs



	2004	2005	2006	2007	2008	2009	2010	2011
Delayed switch-off	0	102	140	187	208	380	534	315
No switch-off	2,972	3,131	2,918	2,949	3,006	2,871	2,797	2,770

Added Sales Value –
on time switch-off vs. one year delay



- A delay in analogue switch-off would push back the additional sales it creates
- Due to technological developments, average product pricing will have fallen (especially for TV-sets), leading to an overall reduction in sales, although volumes would stay roughly the same
- If analogue switch-off takes place between 2008-2011 retailers will have increased sales of £1.9bn (compared with no switch-off)
- This is about £500m less than if the switch-off occurs between 2007-2010

Contents

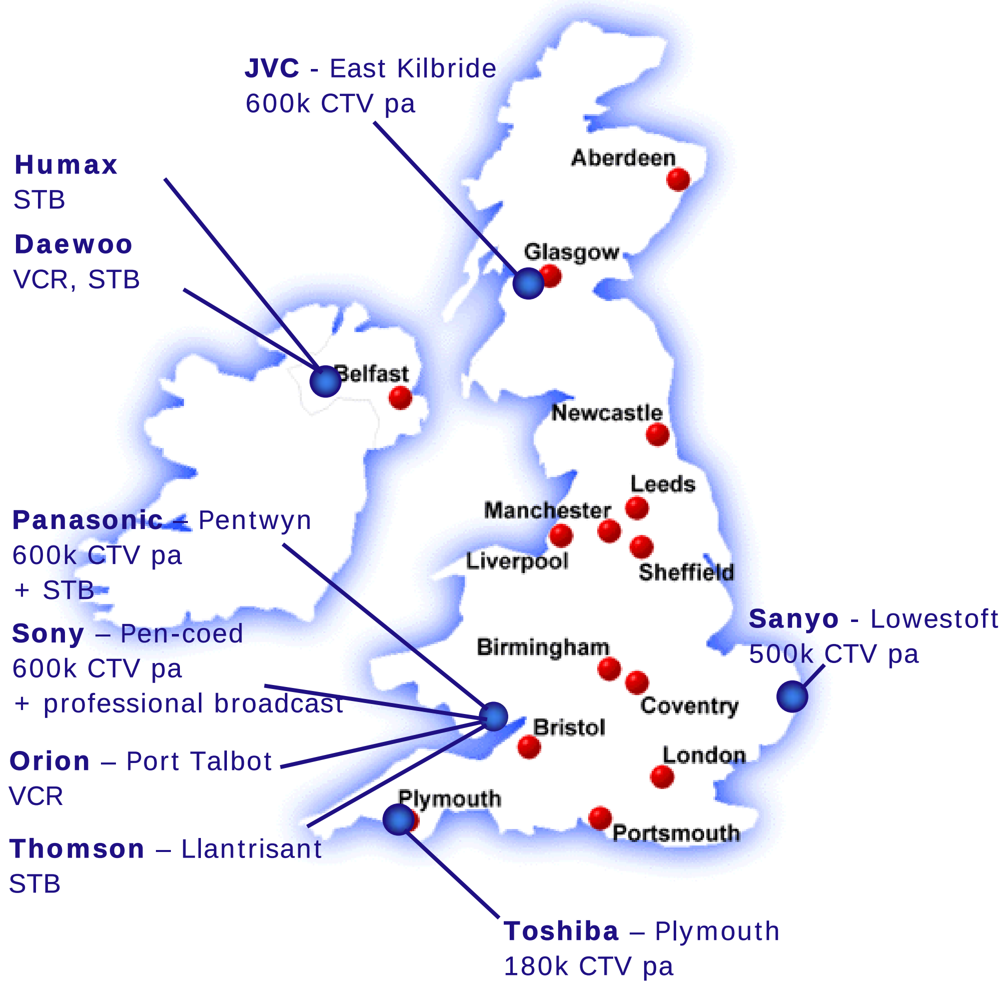
UK manufacturing and R&D would benefit from an announcement that gave them time to prepare. Sales would increase by £1.0bn between 2005-2010

HEADLINES

- UK TV manufacturers and developers are affected in different ways by an announcement of analogue switch off, but all want a clear message soon
- UK TV manufacturing is generally located in areas that in the past have received economic assistance grants with a concentration in South Wales
- The UK digital TV R&D base is strong in broadcast technology, consumer equipment product development and semiconductor device research
- Most digital TV consumer electronics players have internal alternative options ready to replace their UK facilities
- Consumer electronics manufacturing in South Wales is under threat. The manufacturers are part of multinationals that make global decisions
- Retaining R&D depends on the perception that the UK is a Digital TV leader. European developments and uncertainty over analogue switch off threaten this
- An announcement will increase sales of TVs, STB and recorders by about £1.0bn between 2005 and 2010

UK TV manufacturing is generally located in areas that in the past have received economic assistance grants with a concentration in South Wales

- UK TV production is approximately 2.5m units pa
- It is almost exclusively high end CRT models although some flat panel and projection TV production has started
- The majority (over 75%) of UK TV production is for the UK market because the local market requirements differ from Europe and £/€ exchange rate makes most products uncompetitive in Europe
- There is a strong link between R&D and manufacture during the early phase of market development driven by:
  - The availability of test signals
  - Critical mass of experts and engineers in both broadcast and consumer products working co-operatively
- STB and VCR production is considered to be more commodity so OEM manufacturers of VCR and STB are driven by market proximity and cost to produce. These are usually final assembly only, and could easily move to lower cost locations



The UK digital TV R&D base is strong in broadcast technology, consumer equipment product development and semiconductor device research

- **The current situation has developed through the leadership shown by Sky and DTG. The base MPEG receiver and broadcast technology work is largely complete. The focus is now moving towards cost reduction and development of advanced services possible through digital technology and solving platform interoperability issues**
- **The UK R&D base has benefited greatly from the integrated and cooperative approach taken by both broadcasters, technology providers and manufacturers**
- **There is evidence of increased activity by small specialist R&D consultancies providing design skills to APAC based OEM suppliers. This is largely a technology transfer activity and probably a short term phenomenon.**

Consumer electronics manufacturing in South Wales is under threat. The manufacturers are part of multinationals that make global decisions

- **The perceived UK leadership in both satellite and terrestrial digital TV and the advanced state of market development has been a major factor in keeping TV manufacture investment in UK. An announcement of firm plans for Analogue TV switch off will maintain this perception**
- **An announcement will act as a catalyst for decision making or the implementation of decisions already made. In some cases this will expedite the closure of plants, in others it will allow investment to continue.**
- **Main factors affecting decision to locate manufacturing in UK**
  - **Overall cost of operations including cost of employment, cost of materials, fuel and transport costs, exchange rates, local and national taxes and incentives**
  - **local component support, local skills base**
  - **local market size & customer base, market differentiation from global market**
- **The continuation of VCR and STB production in the UK is far harder to predict because of the limited amount of perceived added value.**

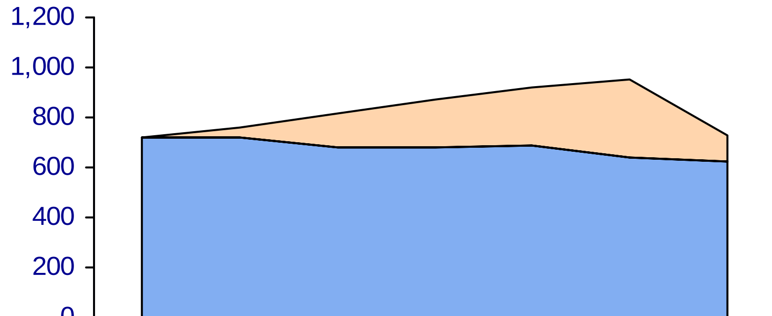
Retaining R&D depends on the perception that the UK is a Digital TV leader. European developments and uncertainty over analogue switch off threaten this

- **The UK leadership position for location of choice as a base for Digital TV R&D is under threat for the change in perception about its market leadership:**
  - **The adoption of MHP in many European countries as the basis for interactive services**
  - **A perception there is a lack of clarity and the commitment in the UK to analogue switch off**
  - **Increasing perceived commitment from other European governments to analogue switch off is diverting attention away from the UK**
- **A delayed announcement beyond March 2005 of a clear plan for analogue switch off further weakens the perception of the UK holding a market leading position and is the best base for integrated circuit and product design**
- **Some of the R&D jobs are related to manufacturing decisions. Some companies have duplicate or competing facilities in Europe and can decide to invest and develop these at the expense of the UK**
- **With one exception, all R&D is undertaken by multinational groups.**

An announcement would provide manufacturers with about £1.0bn in increased revenue between 2005 and 2010

Total Sales Value, Manufacturers

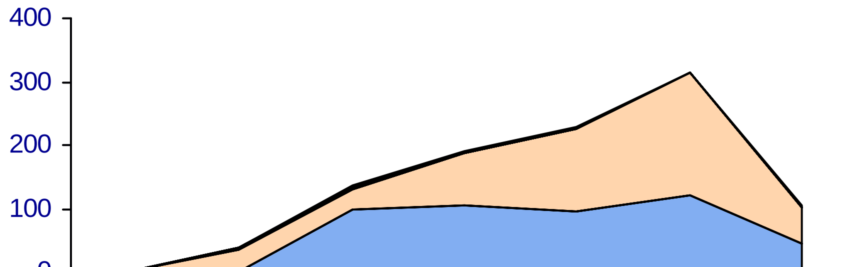
TV-sets, VCRs, STBs, PVRs
£ million



	2004	2005	2006	2007	2008	2009	2010
Switch-off 2007-2010	0	37	138	192	228	316	103
No analogue switch-off	720	722	677	677	690	640	623

Added Sales Value by Product

£ million



	2004	2005	2006	2007	2008	2009	2010
PVRs	0	1	3	3	1	1	1
VCRs	0	3	3	1	0	0	0
STBs	0	34	33	82	131	195	56
TV-sets	0	0	98	105	96	121	46

- **An announcement about digital switch-over is estimated increase manufacturers revenues by approximately £1.0 billion over the period 2005-2010, leading to increased cumulative gross margins of £210 million**
- **This is equivalent to a 25% increase in total sales and gross margin of these products over the period, due to higher volumes being manufactured in the UK and an increased proportion of higher end TV-sets as % of total production**
- **The industry that will benefit the most is the STB industry, which will enjoy higher sales of all types of STBs in case of an analogue switch-off**

TV-sets and set top boxes are manufactured in the UK in significant volumes for UK consumption

TV-set manufacturing: key assumptions

- About 34% of all TV-sets sold in the UK are also manufactured here, according to industry sources and the ONS. This does not differ between scenarios, but as fewer TV-sets are sold in the "no analogue switch-off case", the net effect will be reduced production of TV-sets in the UK
- TV-sets manufactured in the UK tend to more high-end. In case of an announcement, all sets manufactured in the UK would be iDTV sets by 2010, as compared to 60% of all sets in the case of no announcement
- The gross margin for TV-sets to manufacturers is 21%. There is assumed to be little difference between digital and analogue product in this respect

STBs manufacturing: key assumptions

- 66% of STBs sold in the UK are also manufactured here according to industry sources. If this stays flat, an announcement would mean a drastic increase in volumes and revenues
- An announcement would also be positive in terms of an increased demand for cable and satellite STBs as existing pay-TV subscribers to some extent choose to upgrade their secondary sets from analogue to pay-TV
- Manufacturers gross margins for STBs are about 21%.

Some VCR manufacturing exists in the UK, but is likely to decline in terms of both volume and value; an announcement will have little effect

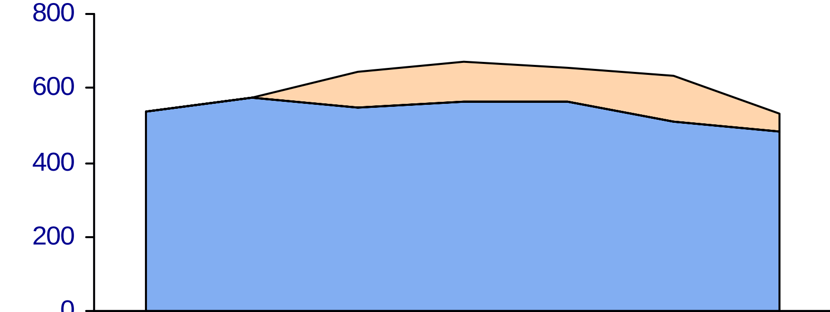
VCR manufacturing: key assumptions

- About 31% of all VCRs sold in the UK are also manufactured here, according to Intellect. This does not differ between scenarios – regardless of a switch-off this is assumed to come down to 0% in the longer term due to reduced volumes and pricing
- The main difference between scenarios is in the pricing. Under the switch-off case, VCRs are assumed to have integral digital tuners, slowing price erosion for a short while
- Note that the STB case includes STBs sold to convert existing analogue VCRs to DTT

For TVs the overall effect of an announcement amounts to a 15% increase in revenues over the period

Total Manufacturer Sales Value, TVs

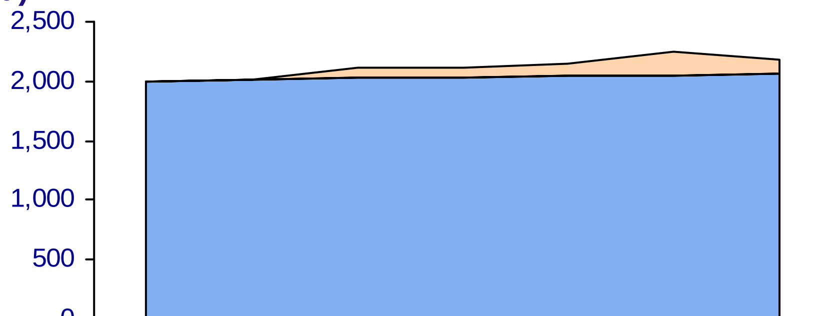
£ million



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	0	98	106	96	121	46
No switch-off	538	574	547	566	561	510	485

Total Units Produced in UK, TVs

('000)



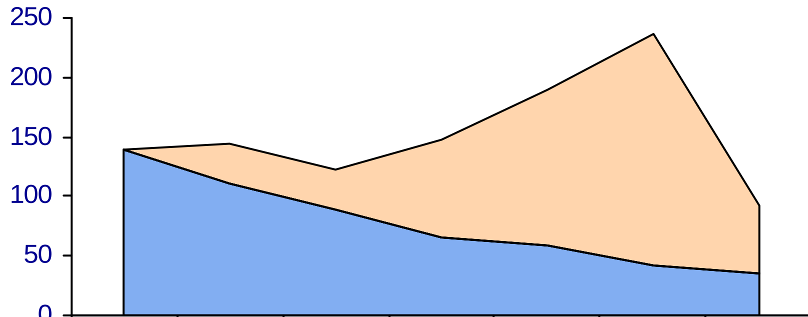
	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	0	84	74	98	197	112
No switch-off	1,999	2,013	2,024	2,034	2,044	2,054	2,064

- **The increased drive towards high-end sets and the increased sales volumes that an announcement would bring would add an additional £465 million in revenues over the period, with approximate gross margins of £100 million**
- **In addition, the higher proportion of iDTVs being manufactured in the UK would require an increased level of cutting edge technical knowledge in the iDTV and flat panel areas**

For STBs, an announcement could more than double the total value of the manufacturing market for the period 2005-2010

Total Manufacturer Sales Value, All STBs

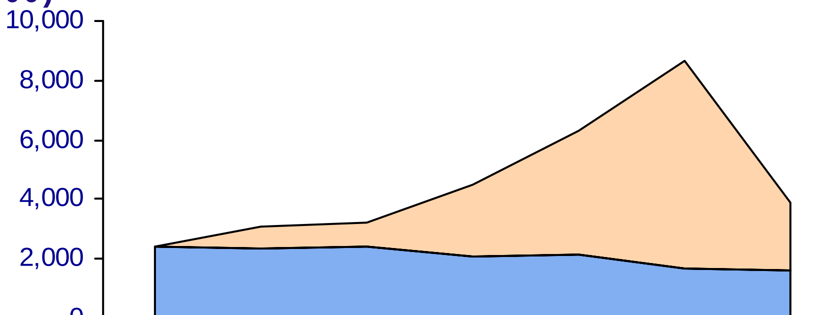
£ million



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	34	33	82	131	195	56
No switch-off	140	110	90	65	59	42	36

Total Units Produced in UK, STBs

('000)

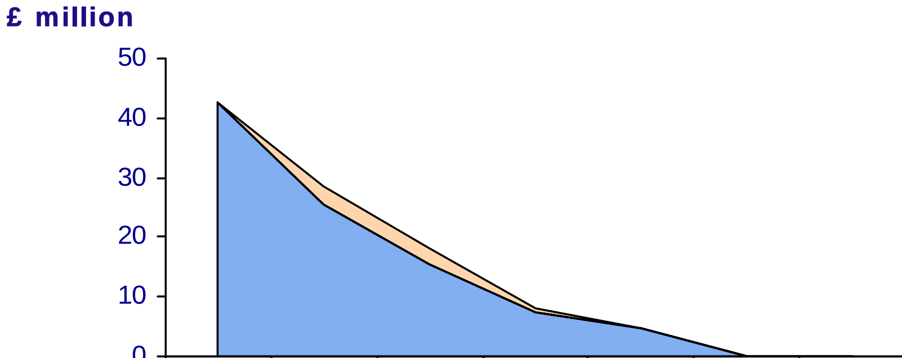


	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	719	809	2,407	4,196	6,934	2,302
No switch-off	2,400	2,352	2,396	2,101	2,137	1,698	1,624

- **The increased STB sales volumes that an announcement would bring would increase overall revenues for the period by approximately £530 million. This equates to an additional gross margin of £110 million over the same period**
- **This would require an increase in capacity in the peak year of 2009 of 7.0 million units, possibly partly covered by redirection of production capacity from export to the UK market. Whether this is realistic or desirable is open for discussion**

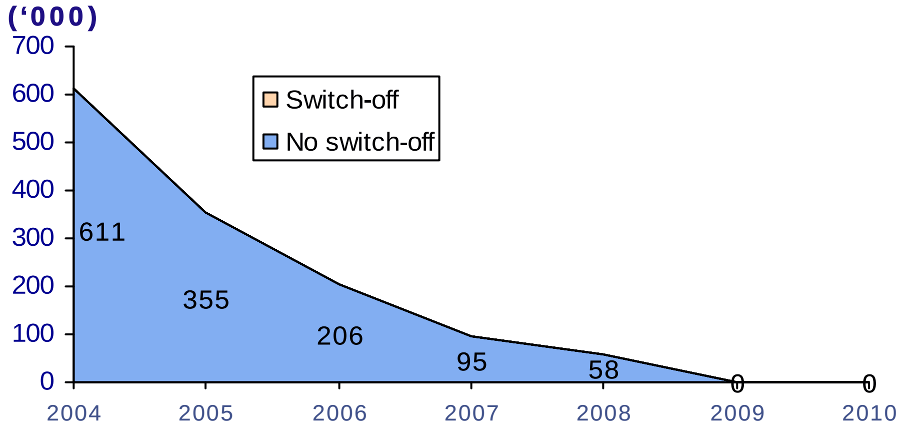
For VCRs, an announcement will have little effect, except possibly increasing revenues and pricing marginally during the last years of manufacturing

Total Manufacturer Sales Value, VCRs



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	3	3	1	0	0	0
No switch-off	43	26	15	7	5	0	0

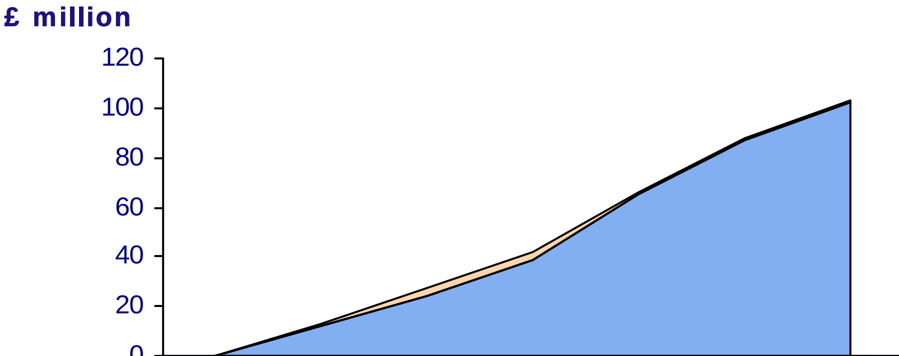
Total Units Produced in UK, VCRs



- An announcement would not bring increased volumes, but the positive revenue effect from reduced price erosion will be a cumulative £7 million, adding £1.5 million to manufacturers overall gross margin

An announcement is likely to have little impact on PVR manufacturing in the UK, as this market is new and will grow regardless of analogue switch-off

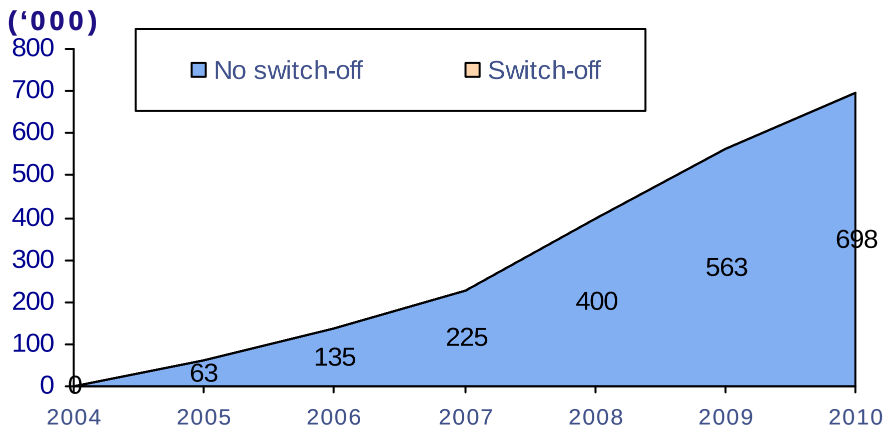
Total Manufacturer Sales Value, PVRs



	2004	2005	2006	2007	2008	2009	2010
Switch-off	0	1	3	3	1	1	1
No switch-off	0	12	24	39	65	87	103

- The small differential between the two cases (approximately £9 million) is driven by a slower price erosion in the switch-off case, driven by more DTT enabled product with a higher average selling price
- There will be no difference between the two cases in terms of units produced in the UK over time

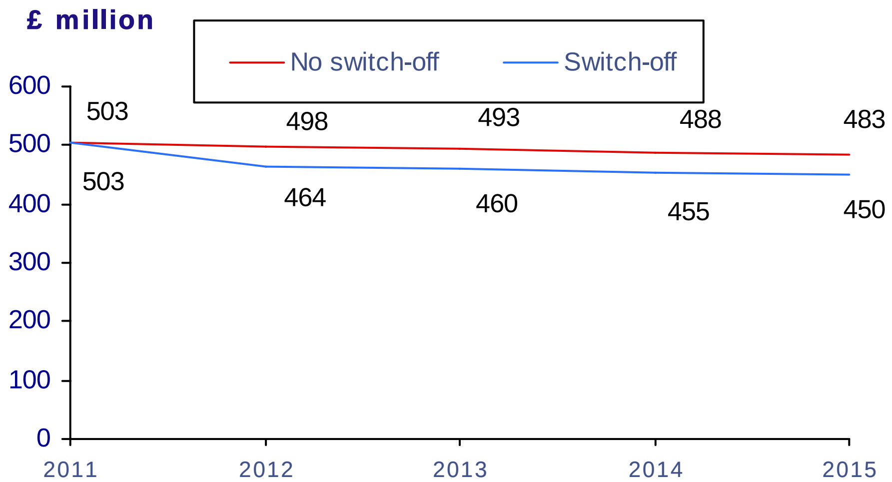
Total Units Produced in UK, PVRs



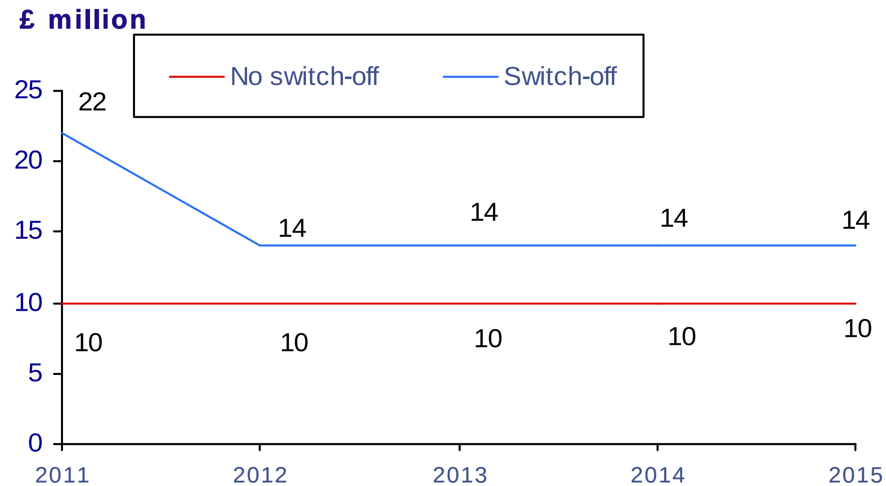
opta
Creating new businesses

Switch-off is likely to reduce UK manucturer revenues by about £105m in the years immediately following switch-off

Total Sales Value 2011-2015: TV-sets



Total Sales Value 2011-2015: STBs

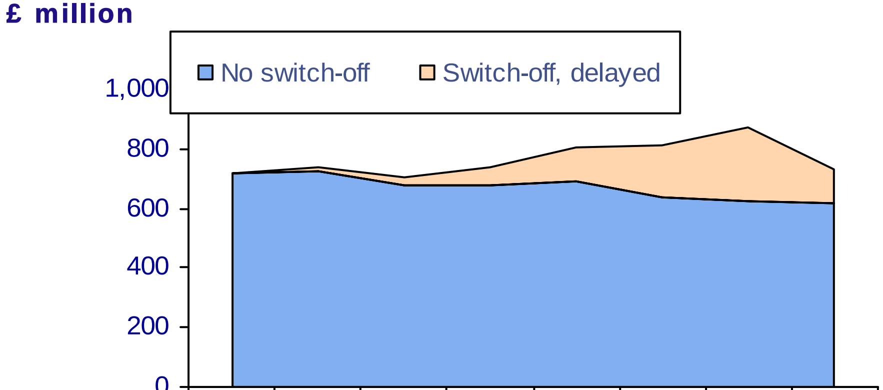


- **Switch-off is likely to increase sales of TV-sets and other equipment during the switch-over period, some of it brought forward from following years**
- **Sales of TV sets are likely to be reduced in the years immediately after 2010 if switch-off goes ahead**
- **The additional 1.6 million TV sets sold in 2005-2010 would likely reduce the average life-length of television sets and reduce volumes and revenues in 2011-2015 by approximately £135 million (about 30% of the additional, non-discounted sales during 2005-2010)**
- **This reduction would be slightly offset by an increased market for replacement DTT STBs. This gain could be £29m between 2011 and 2015 in the "switch-off" case**
- **The net revenue lost to UK manufacturers would be £105 during 2011-2015**

A delay of one year in switch-over would reduce the additional revenues to UK manufacturers over the switch-off period by £110m

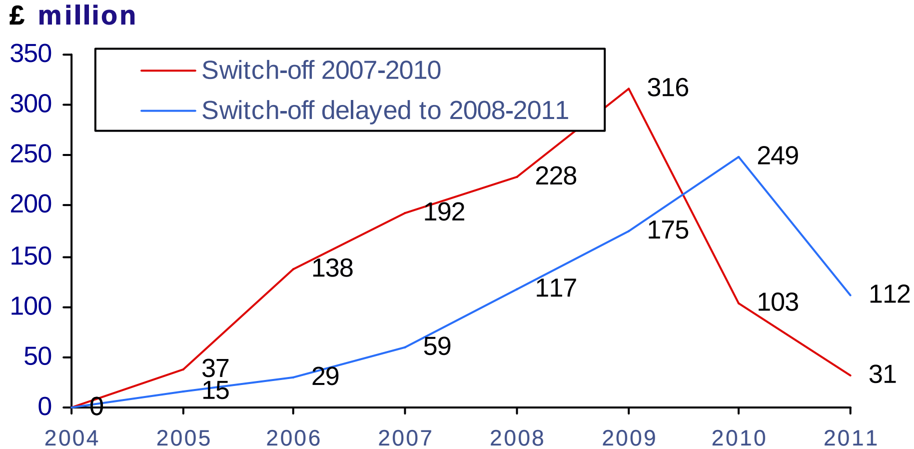
Total Sales Value, Manufacturers – switch-off delayed to 2008-2011

TV-sets, VCRs, STBs, PVRs



	2004	2005	2006	2007	2008	2009	2010	2011
Switch-off, delayed	0	15	29	59	117	175	249	112
No switch-off	720	722	677	677	690	640	623	618

Added Sales Value – on time switch-off vs. one year delay



- **A delay in analogue switch-off would push back the additional sales it creates**
- **A delay would also reduce the speed at which UK TV-set manufacturers move to the higher value products, particularly iDTVs, reducing average pricing for the period**
- **Due to technological developments, average product pricing will also have fallen (especially for TV-sets), leading to an overall reduction in sales although volumes would stay roughly the same**
- **If analogue switch-off takes place between 2008-2011 retailers will have increased sales of £655m (compared with no switch-off)**
- **This is about £290m less than if the switch-off occurs between 2007-2010**

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The aerial manufacturing industry is small and fragmented with UK manufacturers supplying about half the UK's needs

- UK householders purchase about 1m-2m aerials each year to replace damaged aerials, install in new housing and upgrade existing systems (often for digital reception)
- At an estimated £6.5 each, the wholesale aerial market is worth about £9.7m a year – a small fraction of the television equipment market
- The market is highly fragmented with about 30-40 manufacturers in the UK
- UK manufacturers supply about half the UK's needs for aerials, the remainder being imported, typically from Italy and Spain, but increasingly from Eastern Europe
- The aerial industry is partially protected from imports (particularly for lower quality aerials) as transport is a major element of cost for the low value designs – wholesale price can be as low as £2-£3 each
- For higher quality aerials – including those suitable for digital reception – imports pose more of a threat as transport costs are less of an overhead on wholesales prices typically in the range £9-£15
- Aerial installation is a much larger industry, with a typical household installation typically costing £140, but is not within the scope of this study

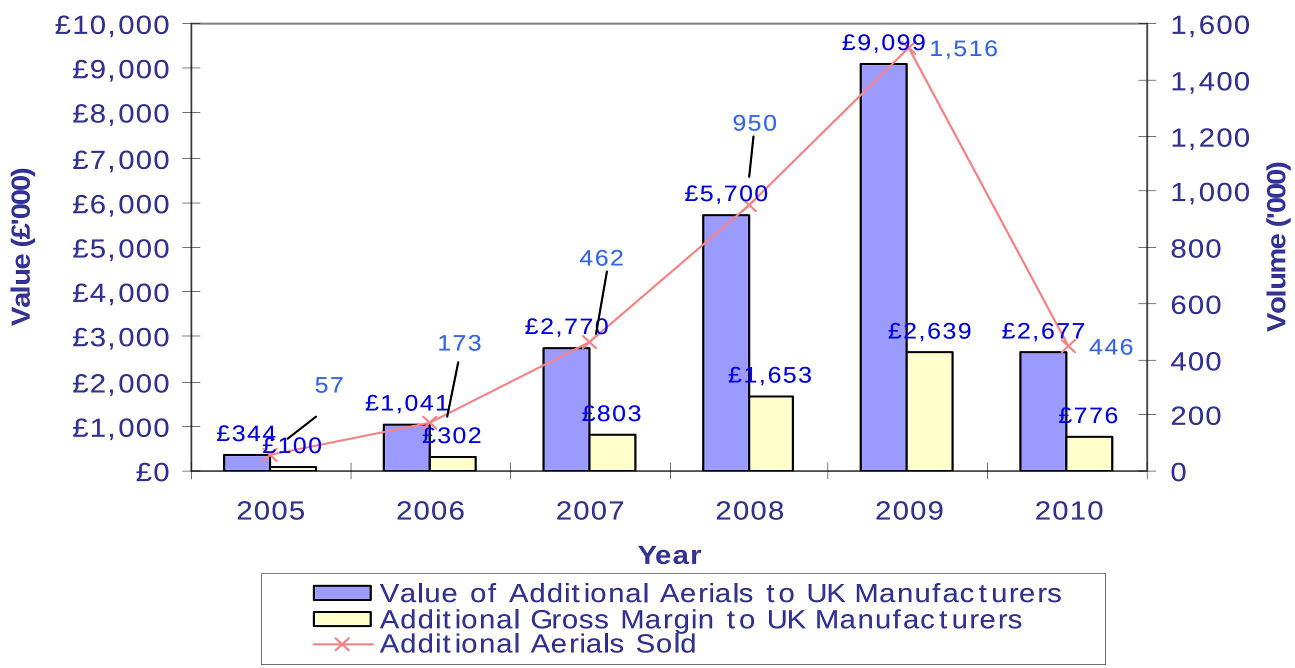
Analogue switch-off would be positive in the short term for UK manufacturers of high quality aerials, but be negative for lower quality manufacturers

- Industry observers believe UK manufacturers have a higher market share of cheap, low quality aerials and a lower market share of high end aerials – producing an overall average of about 50% market share
- Digital transmissions require higher quality aerials – which favours imported aerials
- Analogue switch off would benefit UK manufacturers of high quality aerials and foreign manufacturers – as there would be a short term increase in demand for their aerials
- However, UK manufacturers of lower quality aerials would lose out as their products would no longer be competitive
- The overall shift could be from 50% aerials imported to 70% imported, according so industry sources

Analogue switch off will create demand for about another 3.5m aerials, with UK manufacturers getting additional revenues of £21.6m

- Our model suggests that about 3.5m new TV aerials would be required as a result of analogue switch-off
- With a UK market share of 50% this would create additional revenues of about £21.6m over the period 2005-2010 for UK manufacturers

Impact of Analogue Switch-Off on the Aerial Market



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Interviewees

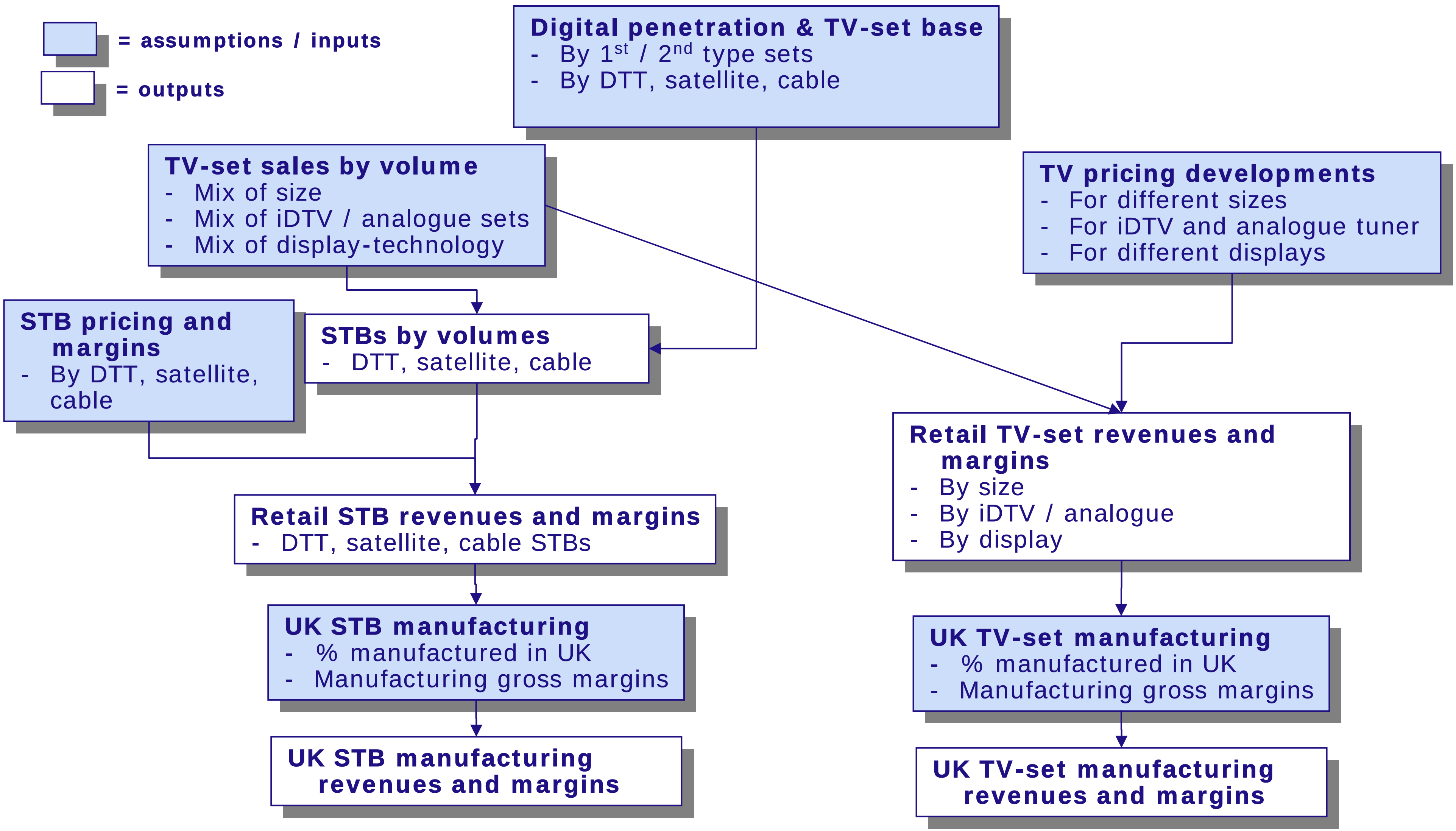
Structure of Impact Model

We have consulted widely across the industry

Interviewees

Name	Position	Organisation
Daniel Harris	CEO	Alba Group
Tim Jenks	Technical Executive	Confederation of Aerial Industries
Simon Drought	Sales and Marketing Director	Daewoo
Chris Brown	Assistant Buying Director, Consumer Products	Dixons
Marcus Coleman	CEO	DTG
Peter Marshall	Technical Director	DTG
Richard Lindsay-Davis	Director, Corporate Affairs	DTG
Sean McCartney	Technical Manager	Fracarro (UK) Ltd. (Aerial manufacturer)
Hugh Peltor	Director, Consumer Electronics	Intellect
George Fullam	Technical Services	Intellect
Malcolm House	Economist	Intellect
Bart DeLomberde	TV Product Factory Planning	JVC
Martin Turner	Managing Director (+ Board Member of CAI)	Martin Turner Direct (Aerial Installation)
Graham North	UK Region Director	Pace
David Johnson	Digital Champion	Philips
Fred Round	Chief Executive	Radio Electrical & Television Retailers Association
Peter Eldon	Sales and Marketing Director	Sanyo UK
Noel Salmon	Deputy Managing Director, Sanyo Manufacturing, Lowestoft	Sanyo UK
Tony Abbott	Director of UK Manufacturing	Sony
Adrian Northover-Smith	TV Product Manager	Sony
Nigel Pritchard	Business Development Manager	ST Microelectronics
Iain Currie	Sales Manager, DTV products	ST Microelectronics
David Cutts	Managing Director	Strategy and Technology (Industry Consultant)
Vassilis Seferidis	European Business Senior Strategist	Toshiba
Simon Heape	Marketing Manager, Colour TV	Toshiba
Vic Harasimow	Marketing Manager, DVD, VCR and combined products	Toshiba

Model Structure – TV-sets and STBs



Model Structure – VCRs, R-DVDs and PVRs