High Definition TV services on the digital terrestrial television platform

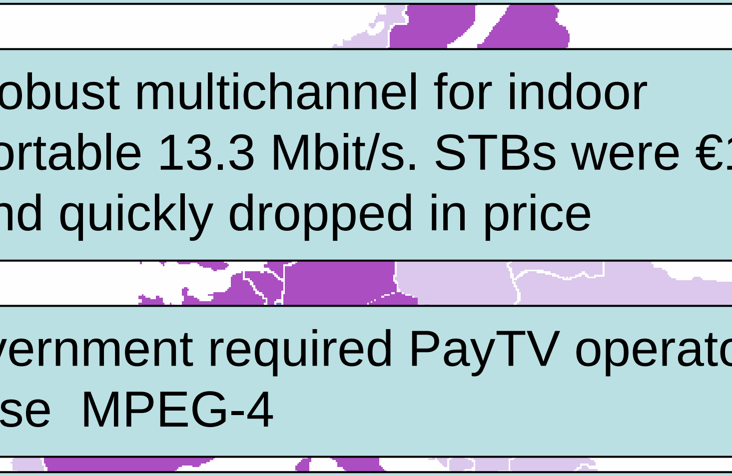
Edgar Wilson, EBU

DigiTAG Project Manager

Anacom Workshop, Aveiro, 9 July 2007

DigiTAG

DTT status in Europe



- UK (Nov 1998)
- Sweden (Sept 1999)
- Spain (May 2000 / Nov 2005)
- Finland (Oct 2002)
- Italy (Jan 2004)
- Germany (May 2004)
- NL (Summer 2004)
- Belgium (Oct 2004)
- Malta (July 2005)
- France (Sept 2005)
- Switzerland (Nov 2005)
- Denmark (March 2006)
- Austria (October 2006)
- Estonia (December 2006)

Started as PayTV – relaunched as Freeview
STBs were £300 – later £99 and less
24 Mbit/s 24 and 18 Mbit/s

Robust multichannel for indoor portable 13.3 Mbit/s. STBs were €199 and quickly dropped in price

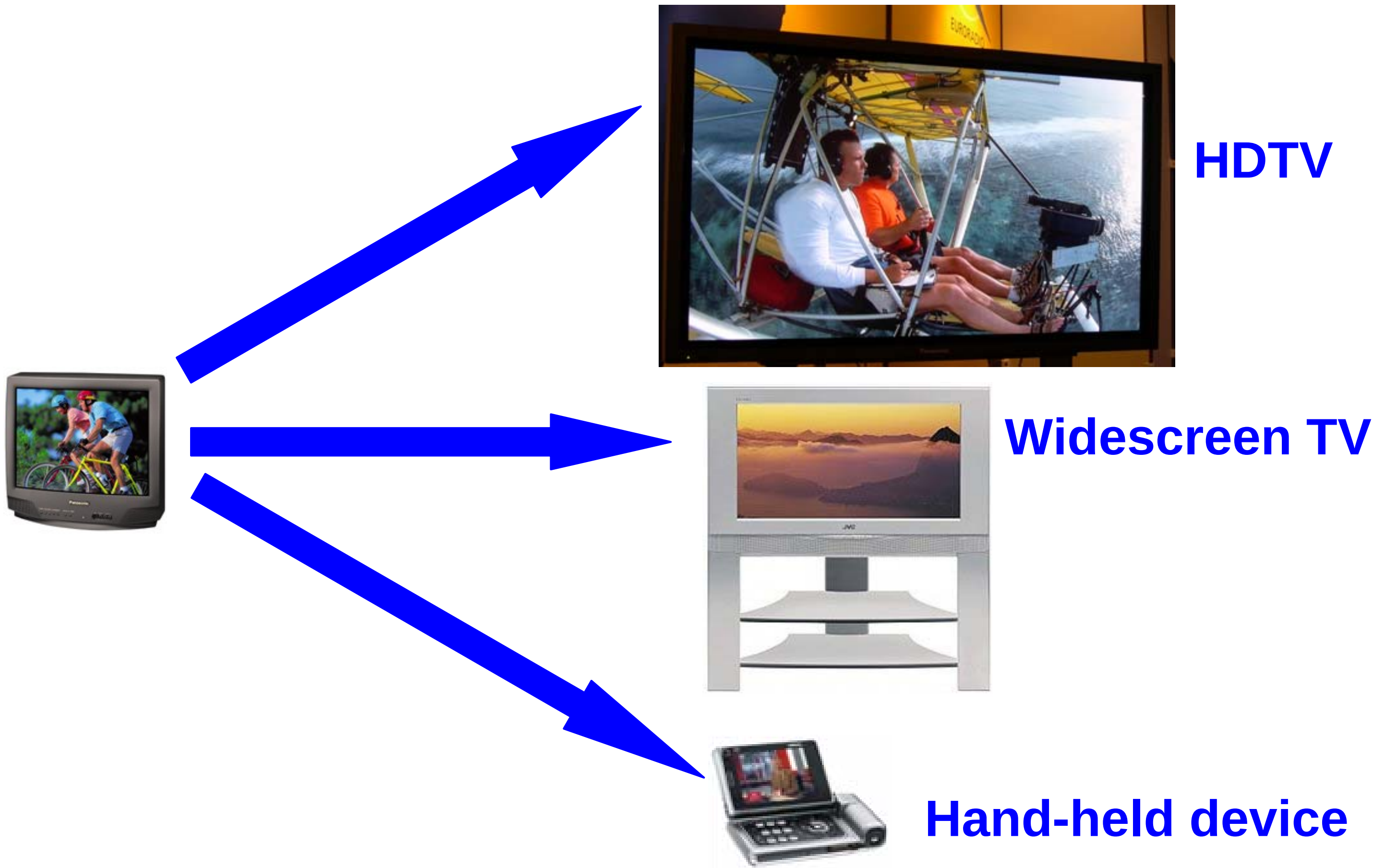
Government required PayTV operators to use MPEG-4

Swiss broadcaster turned off half its analogue TV services in April 2002

Use MPEG-4 for all services. STBs at €109 are HD capable

DigiTAG

Evolution of digital TV



Terrestrial HDTV

- Outside Europe, digital terrestrial transmissions successfully carry HDTV
  - Japan, USA, Korea, Australia . . . .
- Within Europe, HDTV on digital terrestrial transmitters has been dismissed as:
  - an unnecessary luxury
  - a waste of valuable spectrum

- Are the laws of physics different in Europe?
- Are the rules of economics different in Europe?

History of HDTV in Europe

- HDTV in Europe has just celebrated its 25th Birthday!
- Demonstrations given to the EBU General Assembly on 25-28 June 1982, in Killarney, Ireland, were a major milestone in the development of HDTV.
- They raised European awareness of the potential of HDTV to provide a significantly improved viewing experience.
- HD-MAC in the late 80s anticipated too early the market opportunity for HDTV - the public instead chose multichannel analogue satellite TV.
- Now consumers have been buying HD-ready displays before any HDTV content is available (never happened before with any other broadcast technology!)

Transition to HDTV . . . .

- If terrestrial broadcasters are not allowed to deliver HDTV, the terrestrial market will decline
- Is there sufficient spectrum for terrestrial broadcasters to offer a substantial package of HDTV services?
  - not unless some SDTV services are closed . .
  - must move to MPEG-4 AVC & anticipate availability of DVB-T2 (required to offer >30% more capacity)
- A long-term plan for migration to HDTV is needed
  - people expect their TVs to last “for ever”
  - Integrated Digital TV market is bigger than that for STBs.

Success of DTT

Having overcome some early problems, DTT is now successful in many European countries

- very diverse modes and applications have exploited the inherent flexibility of the technology and the dynamic evolution of the market place
- receiver technology developments have made portable devices and in-car entertainment work
- without this success, there would be no all-digital frequency plan and no digital dividend
- but DTT services are based on multi-channel SDTV so how to move to HDTV?

Consultancy Research

- DigiTAG asked the Understanding & Solutions consultancy to address some HDTV issues:
  - Identify demand drivers and forecasts for HD DTT.
  - Assess the technology challenges involved in HD broadcasting.
  - Evaluate the economic factors facing HD on the terrestrial platform.
  - Develop potential business models for HD DTT in Europe.
  - Provide recommendations for implementing future HD DTT services.

What are the HD DTT drivers?

DigiTAG

HD Broadcast Issues

Can terrestrial broadcasters provide HD DTT?
What other competing platforms are providing HD content?

HD Consumer Equipment Issues

What in-home equipment will consumers watch HD DTT on?

HD Content Issues

Do consumers want HD?
What content should be in HD?
Is there enough HD content?

HD Broadcast Issues

Broadcast Issues and Drivers

- DTT is not homogenous in Europe
- There are wide variations in the dependence on the terrestrial broadcast for the main household TV.
  - In countries such as Italy, Spain and France, terrestrial is the dominant platform.
  - But in many other countries terrestrial competes with or is dominated by other platforms for the main TV set.
- The importance of DTT to the main household TV in each country will have a major impact on the demand and potential for HD DTT.

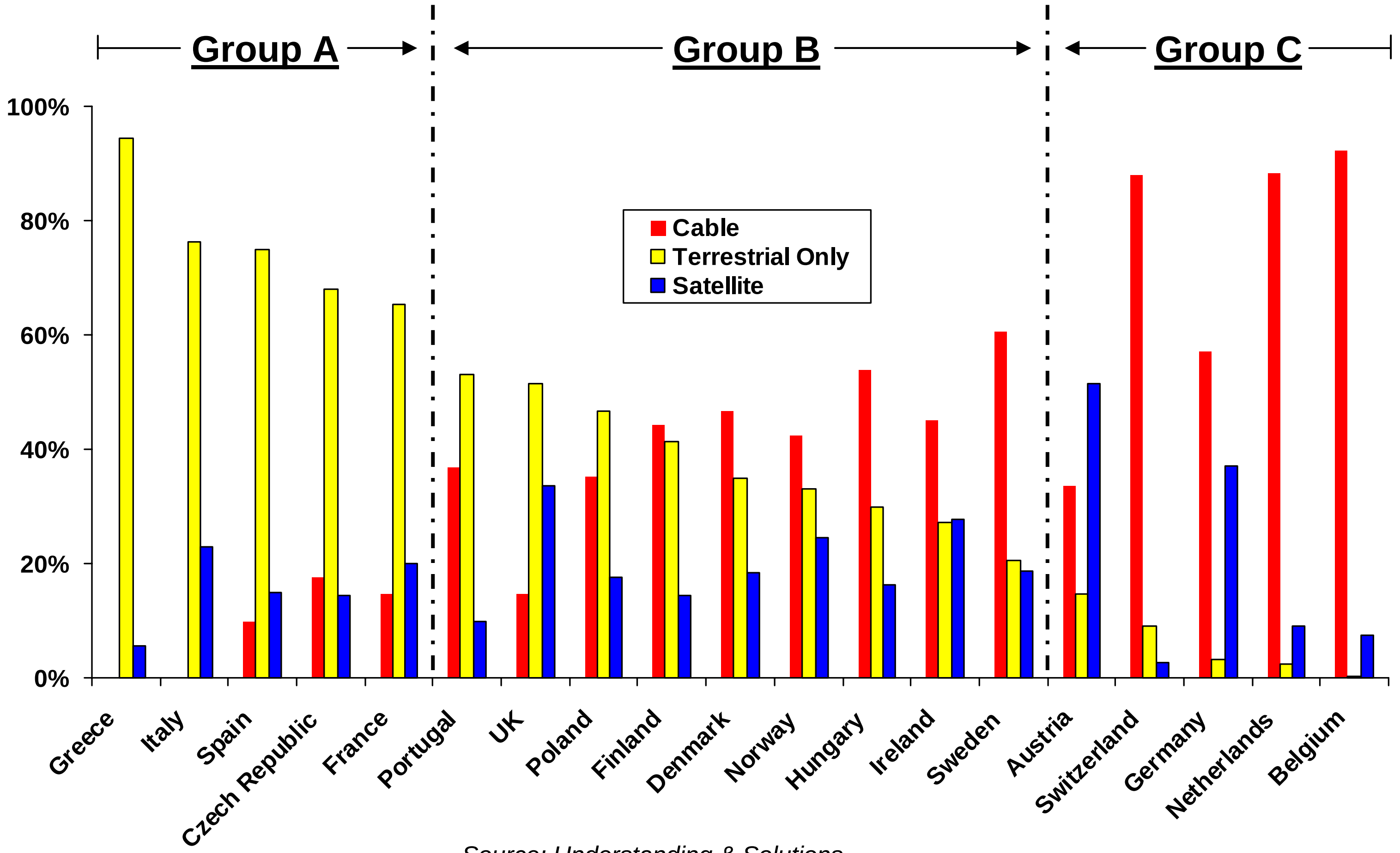
Broadcast Issues and Drivers

- It is difficult to provide a general business model for HD DTT that is applicable to all European markets.
  - Three groups of countries are identified, with each group expected to follow a different approach towards HD DTT.

Group A	Group B	Group C
High degree of terrestrial-only households	Mixed platforms: 25% - 50% of households terrestrial only	Predominance of cable and / or satellite

- The critical factor which differentiates these groups is the significance of terrestrial broadcasting and penetration of alternative delivery platforms.

Platform Penetration in Europe



Source: Understanding & Solutions

DigiTAG

HD DTT Developments

Group A	Group B	Group C
• Early HD DTT trials. • Limited range of HD DTT services available as soon as possible.	• Smaller HD DTT trials. • Limited range of HD DTT services available after Analogue Switch-Off.	• Unlikely to implement HD DTT. • Limited SD service will continue.

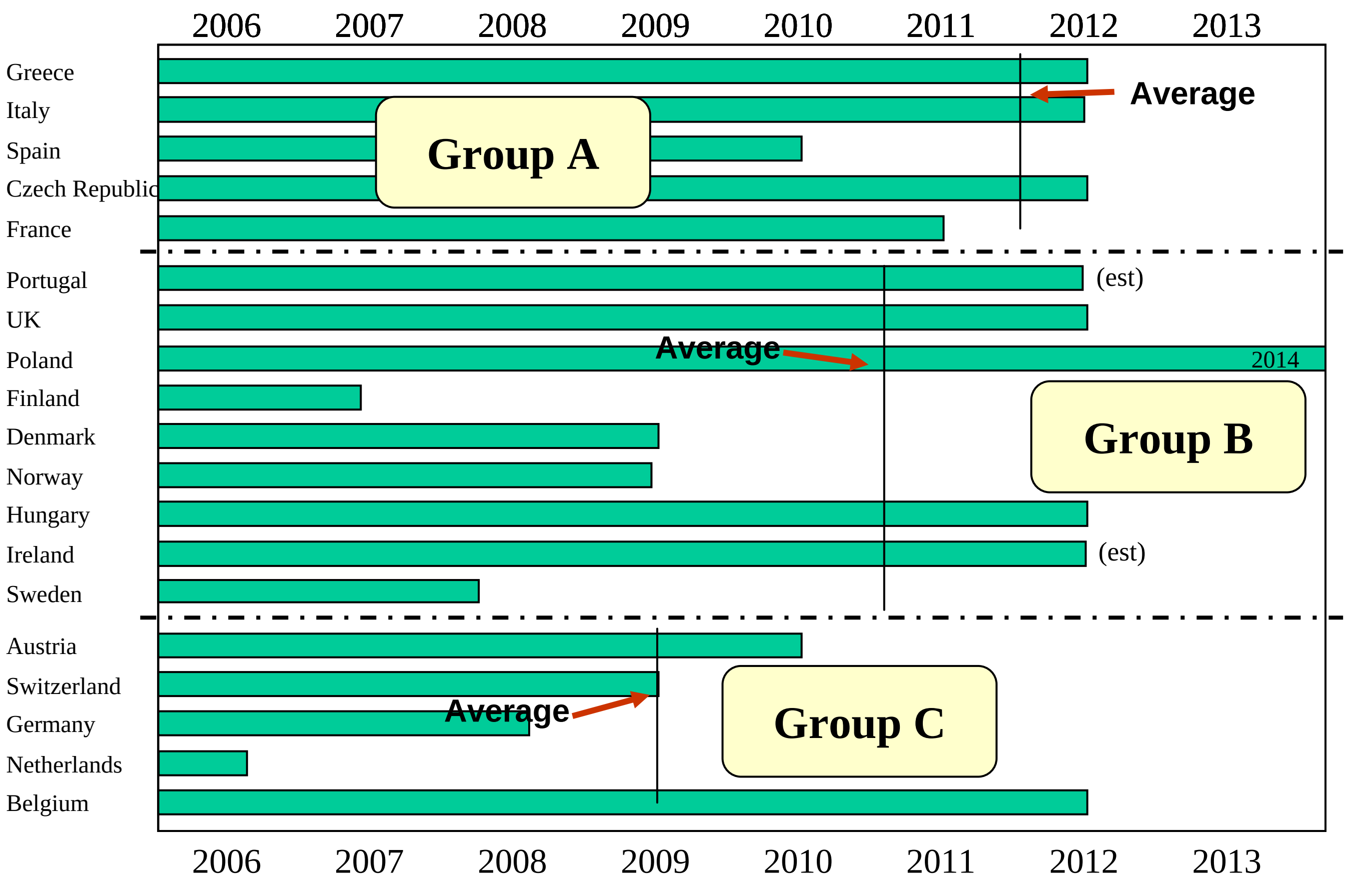
Broadcast Issues and Drivers

- Terrestrial broadcasters generally cannot start HD DTT broadcasting until spectrum is released through Analogue Switch Off (ASO).

- Dates for ASO vary by country, but 12 countries are not planning to complete ASO before 2010 – 2012.

- Those countries most dependent on terrestrial tend to be among the last to switch.

Dates for Completion of Analogue Switch Off



Sources: DigiTAG, Understanding & Solutions

Broadcast Issues and Drivers

- Broadcasters do expect to move to HD production and most to HD transmission.
  - Most recognise that terrestrial has to move to HD or risk being marginalised by the other platforms. There is generally no clear timeline or strategy for the development of HD DTT broadcasting because the ASO dates are still some way in the future.
  - For many, the current concerns are with a successful move to digital and the development of multi-platform TV plans.
- The cost increment of producing in HD is eroding fast, and soon it will be difficult to purchase SD studio equipment.
  - With more content being produced in HD, there will be increasing pressure to broadcast it in HD.

Broadcast Issues and Drivers

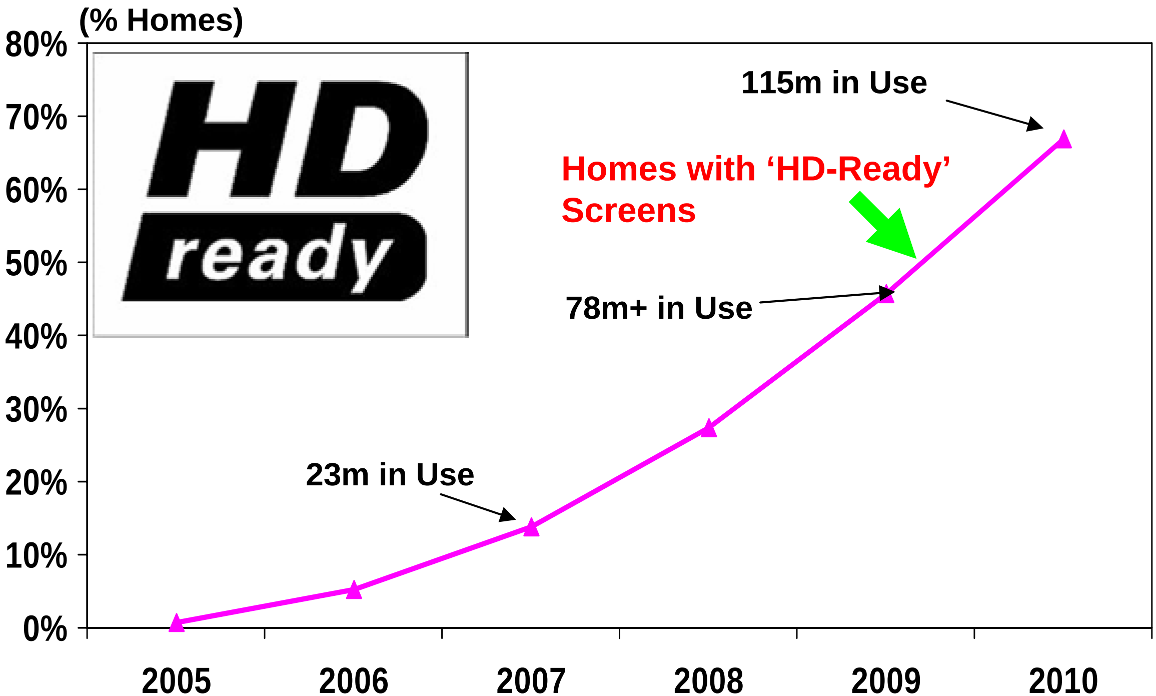
- Overall conclusion:
  - There is no single clear business model for HD DTT
  - There are some additional costs (though these will fall over the next few years)
  - No extra revenues deriving from broadcasting HD content
  - A clear need to defend audience share in a competitive HD market
  - but terrestrial broadcasting is disadvantaged because in many countries it will be unable to compete with other delivery platforms until ASO is complete.

HD Consumer Equipment Issues

Consumer Equipment Issues and Drivers

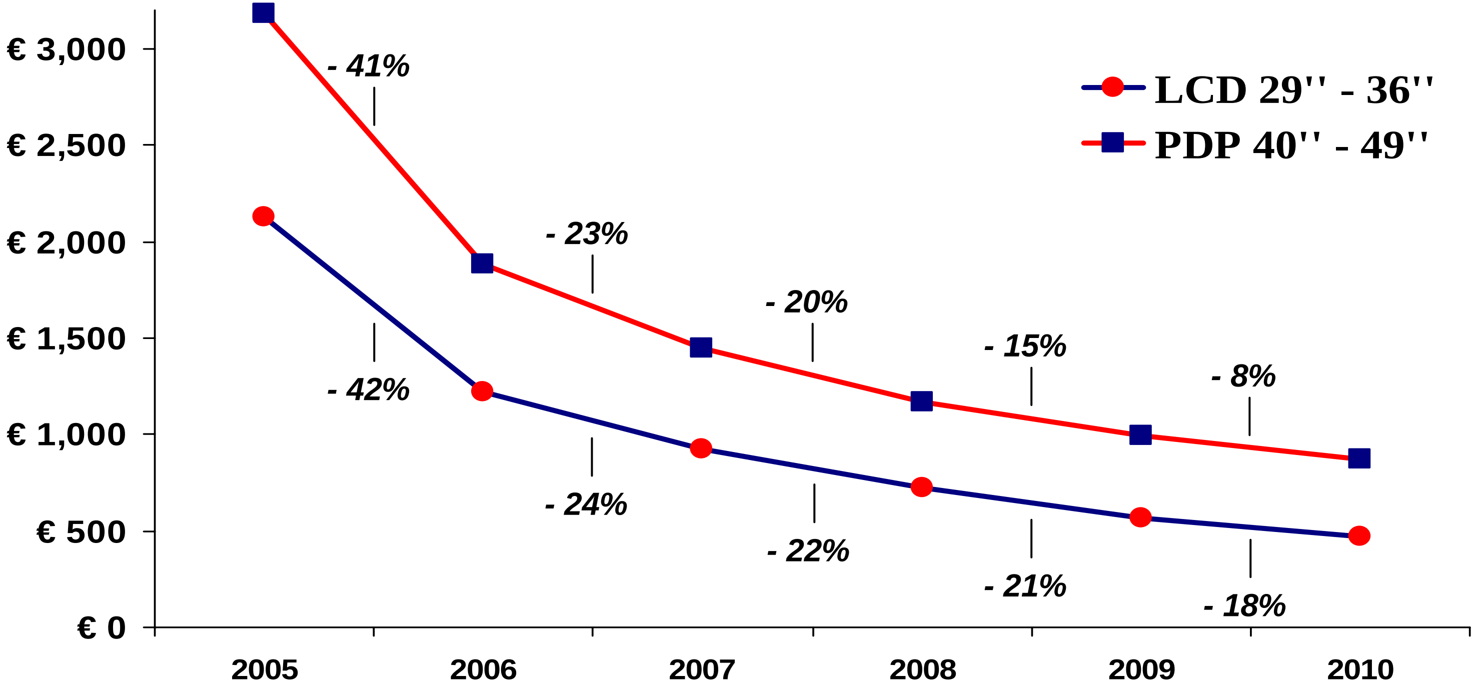
- The uptake of HD-Ready Flat Panel TVs has been dramatic in Europe.
- Key uptake driver is the novelty in design of the TV (flat, thin, widescreen) rather than the fact that it is HD-Ready
- Price falls for both LCD and Plasma panels have been significant.

HD-Ready Market Development: Western Europe



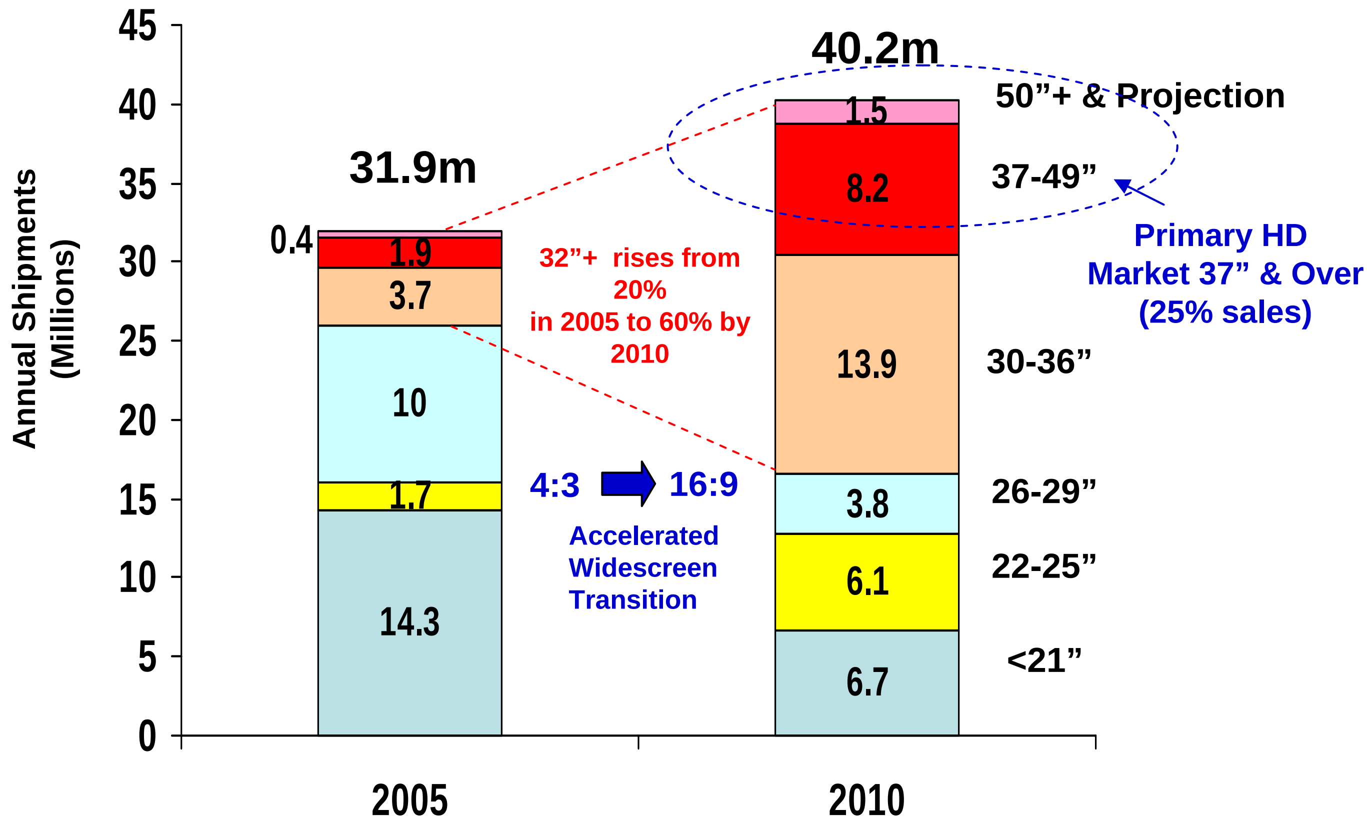
Source: Understanding & Solutions
Digital Distribution of Entertainment Service

HD-Ready Displays
Average Retail Prices – Europe



Source: Understanding & Solutions

Changing Attitudes to Screen Size

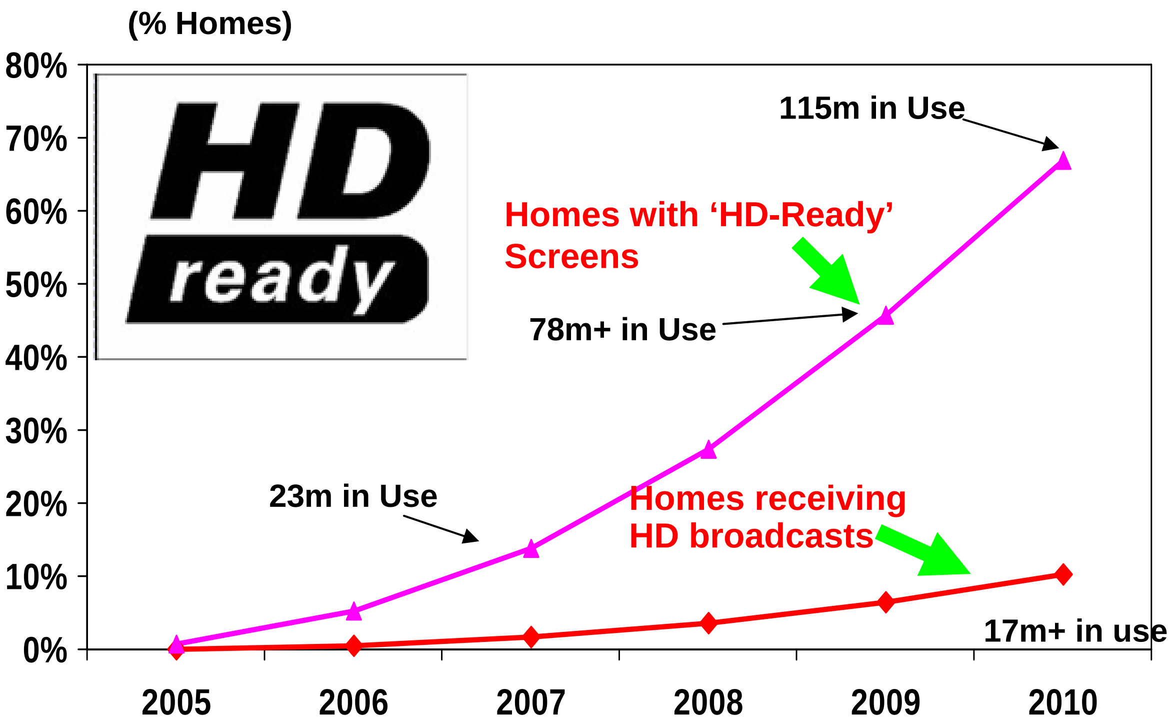


Source: U&S Digital Consumer Electronics Service

Consumer Equipment Issues and Drivers

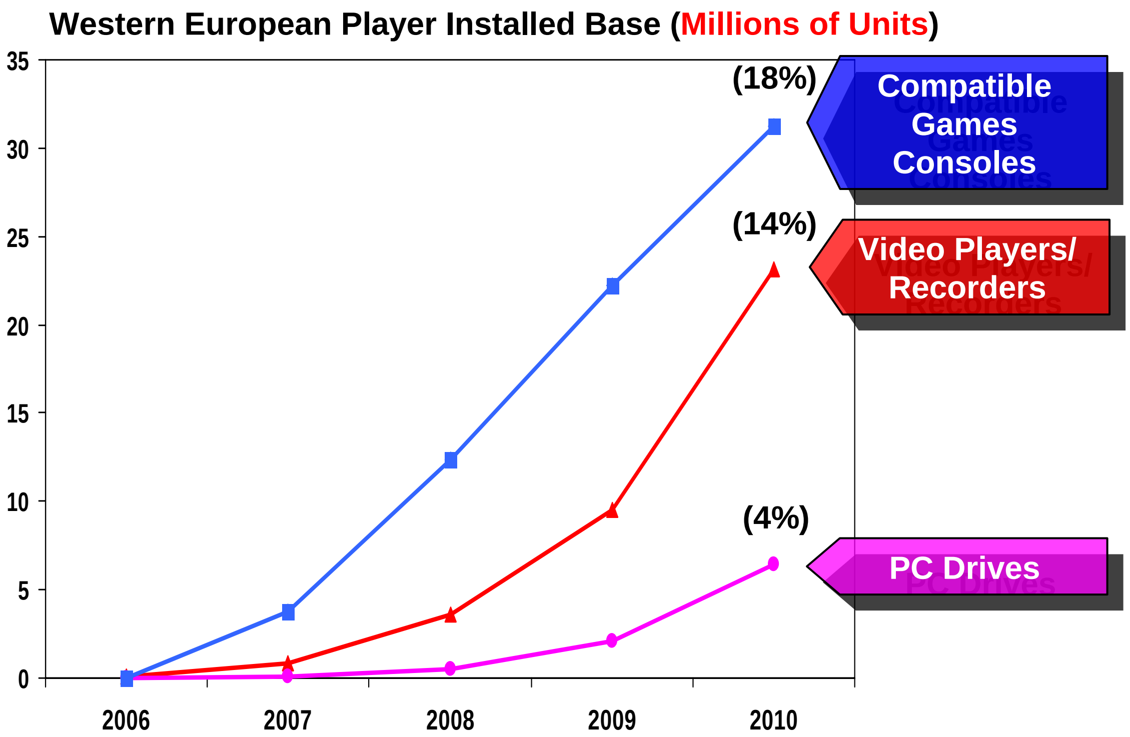
- When consumers upgrade to a flat panel TV, they are increasingly buying larger sizes of screen.
- This places demands on the broadcasters regarding broadcast quality (artefact magnifier).
- There is also a consensus amongst European broadcasters that HD services will require MPEG-4 receivers.
  - There is a legacy of MPEG-2 receivers in many markets that will need to be resolved, and there may be consumer resistance to the cost of upgrading these to MPEG-4.
  - Early transition to MPEG-4 HD-capable receivers would minimise the legacy problem.

High Definition TV Market Development: Western Europe



Source: Understanding & Solutions
Digital Distribution of Entertainment Service

Consumer Electronics, Gaming & PC support for HD



Consumer Equipment

- Overall conclusions:
  - The growth of HD Ready flat panel displays is the major driver for the development of HD services, plus the increasing availability of HD content and HD capable consumer AV devices.
  - Consumers are watching TV on ever larger screens as they move to flat panel displays.
  - In countries that are already successfully migrating from analogue to digital terrestrial broadcast, there is a large legacy installed base of MPEG-2 receivers (either in STBs or integrated DTVs). Solutions for upgrading these to MPEG-4 AVC receivers are available.

HD Content Issues

HD Content Issues and Drivers

- The domestic and international markets need HD content, and there is an opportunity for broadcasters / programme producers to sell programmes internationally.
- Many broadcasters have plans in place to upgrade studios and production equipment to HD on a rolling periodic basis.
- Incremental production costs for HD are falling. Currently in the range of 10 – 15%, both the production and equipment cost increments should reduce significantly and be minimal within 2 years or so.

DigiTAG

HD Content

- Broadcasters are increasingly recognising that a wide range of content genres are appropriate for HD
  - not just sports and high quality drama
  - highest sales of HD Blu-ray disks has been the BBC's 'Planet Earth'
- European and Global sporting events major opportunities to showcase HD programming and can help drive demand for HD products and services.
- It's no coincidence that Swiss broadcasters have announced launching HDTV this year to be ready for Euro 2008 in Austria/Switzerland

.........but only on Satellite!

DigiTAG

High Definition DTT trials

TF1

BBC HD

svt HD

Contact us

- Website: [**www.digitag.org**](http://www.digitag.org)
- Project office: projectoffice@digitag.org
- Subscribe to our web letter with news information on the DTT market
- Handbooks on DVB-H, Analogue Switch-Off Guidance on ude of DVB-SSU and *soon* HDTV