Analysys

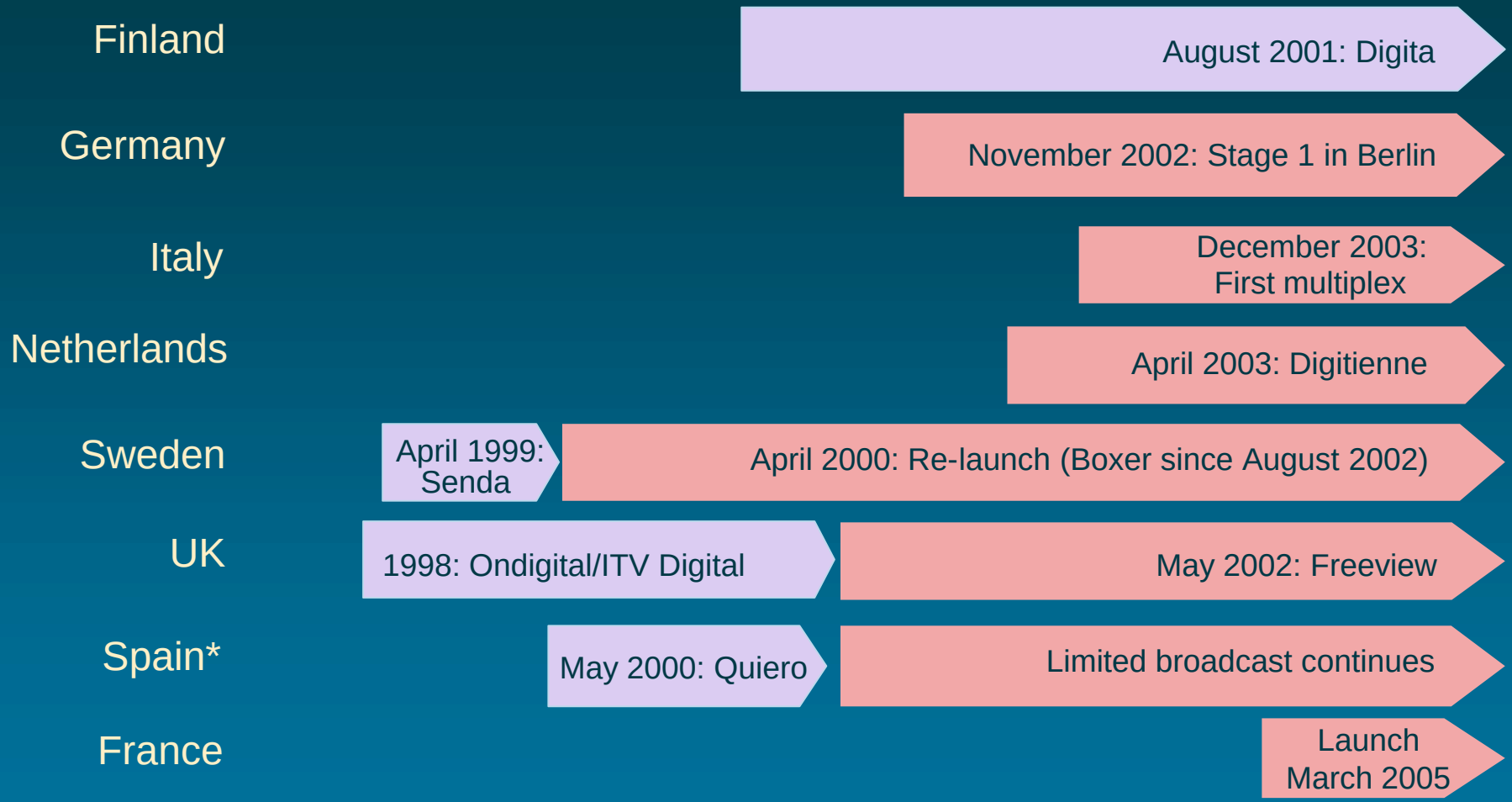
Digital terrestrial television (DTT) developments in Europe

Brussels, September 2005

How may DTT develop in Europe?

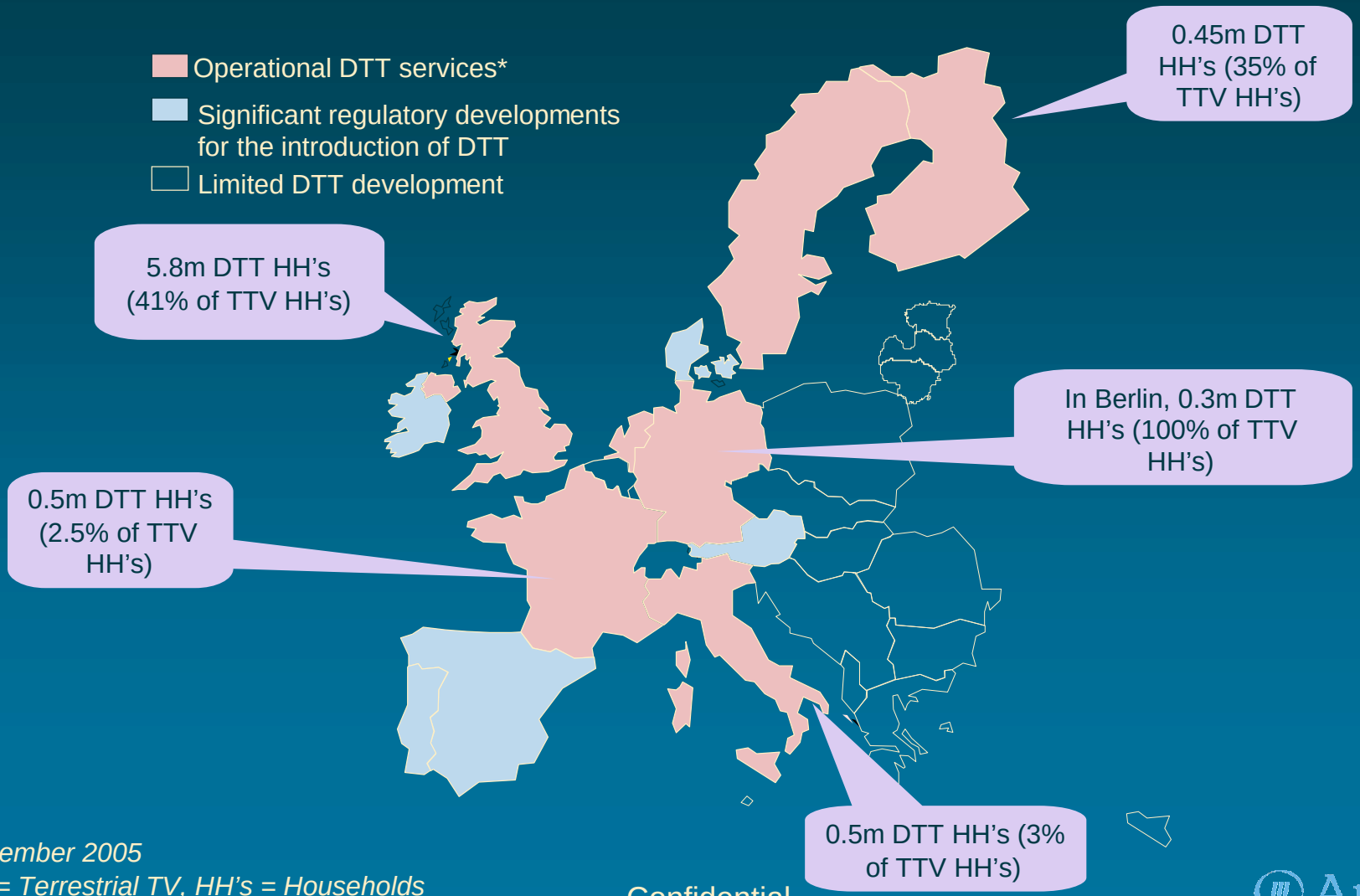
- If digital terrestrial television (DTT) is to contribute towards the migration from analogue to digital TV, the question arises as to how we can ensure that it is successful
- In order to address this question, we have examined the development of DTT in Europe to date:
  - business models
  - policy approaches
  - role of different stakeholders
  - incentives provided to broadcasters

There are two phases in the development of DTT



*Re-launch currently planned November 2005

DTT is finally starting to gain momentum

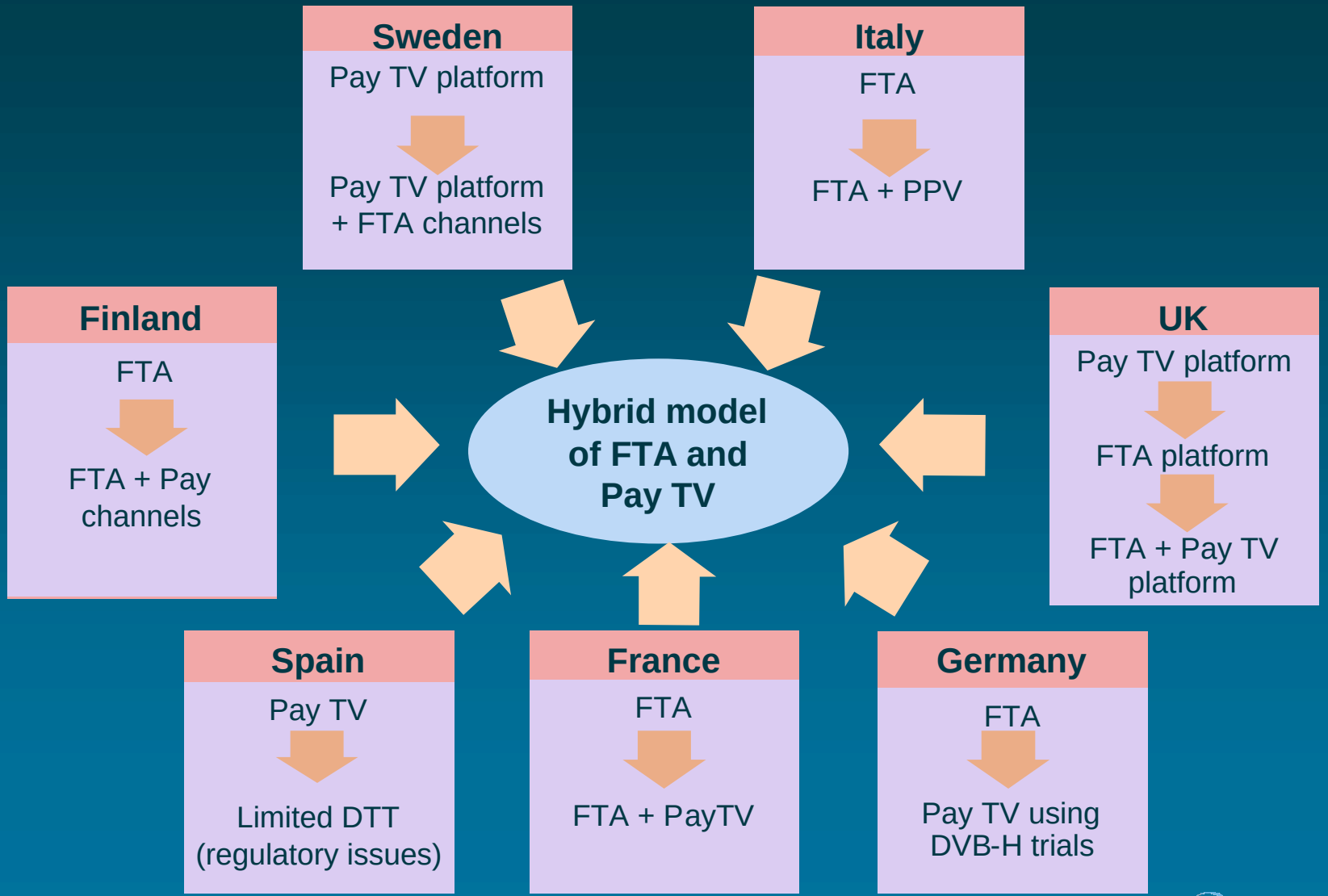


**As of September 2005*
Note: TTV = Terrestrial TV, HH's = Households
Source: DVB, ERO

Three business models have emerged

- **Pay-TV platform:**
  - a premium content offering in direct competition with cable and direct-to-home (DTH). This was the original business model adopted in the UK, Spain and Sweden
- **FTA platform**:
  - variety of free-to-air (FTA) channels. This was the original business model in Italy, Finland and Germany, and has been the business model in the UK since May 2002
- **Hybrid platform**:
  - offering which combines a number of FTA channels, together with a limited pay offering. Migration to a hybrid DTT model has taken place in the UK, Sweden, France and Finland

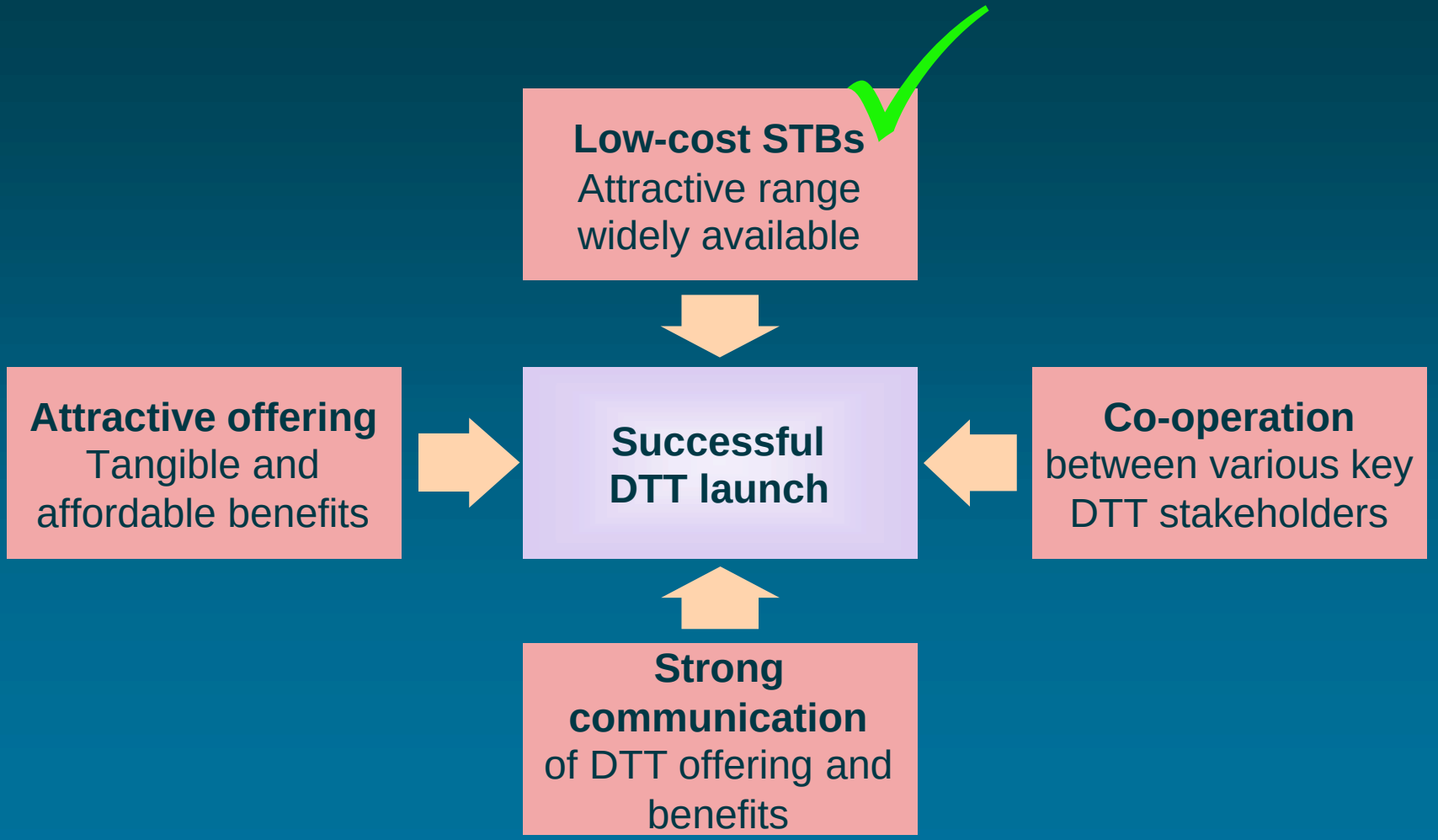
FTA has been key to mass take-up



The hybrid model brings innovation to the pay-TV market

- The arrival of a hybrid model has also brought some innovation to the pay-TV market
- Pay TV is sold using prepaid cards in some countries: Italy (PPV events) and Sweden (subscription)
- As with mobile telephony, the lack of a contract may help take-up. Furthermore, such a revenue collection mechanism is more suitable for customers generating low-medium monthly revenues:
  - EUR15-20 per month likely for pay-TV offerings not containing premium content

Four key prerequisites for the success of DTT launch have been identified



The attractiveness of the DTT offering depends on the market situation

- The attractiveness of the DTT offering depends on:
  - **content –** offered content (including interactive content) that is not already available at the same price, both in quantity and quality
  - **cost –** total cost of the platform, including subscription charges and one-off costs
  - **technology improvements –** better sound and picture quality, portable indoor reception, etc.
- FTA offerings meet these conditions in various countries

A multi-channel offering has been a key attraction

- Experience to date indicates that an FTA multi-channel offering is a key driver of DTT demand:
  - Freeview in the UK, re-launched platform in Sweden
  - DTT take-up has been strong in France
- Viewers value choice of a broader range of channels:
  - although channels already available via analogue FTA may account for a disproportionate share of viewing in multi-channel households
  - analogy with value placed on widespread coverage in the cellular industry

In some cases, technology can be a differentiator for DTT

- In countries with existing strong multi-channel offerings, DTT can differentiate itself by means of technology:
  - in Germany or the Netherlands, consumers have had access to a variety of FTA or low-cost cable content even before the introduction of DTT. In such markets, DTT has differentiated itself on the grounds of portable reception
- However, interactive services have not been a key differentiator:
  - at launch, the UK, Spain and Finland heavily promoted the potential of interactive services
  - in all cases, interactivity was insufficient by itself to drive DTT penetration

Market communication and stakeholder co-operation are important

- Consumers are largely unaware of the value of DTT
- All successful implementations of DTT have required a strong market communication campaign:
  - presence and contents of the offering
  - benefits to subscribers
  - technical issues (coverage, STBs, etc.) and precise switch-over dates
- DTT development requires that the interests of a range of stakeholders be brought together:
  - this includes policy makers, regulators, content owners, as well as multiplex and network owners

Policies are needed to incentivise broadcasters…

- The inclusion of content from incumbents is important for the DTT platform. However, DTT is not necessarily in their interest:
  - more competition, potentially higher costs
- Thus, incumbent broadcasters may require incentives:
  - significant stake in DTT enables public service broadcaster (PSBs) to face competition
  - commercial broadcasters (CSBs) more challenging, as they require a viable business plan

… in ways which are consistent with Community Law

- Incentives given to CSBs include:

Incentive to CSB	*Details*
• Significant stake in DTT	• Award of multiple channels aids maintain share of viewers
• 'Must-carry' obligations	• On alternative platforms
• Lower transmission costs	• DTT cheaper than analogue
• Multi-platform competition	• Entry to market (Mediaset)
• Subsidies	• Berlin example

- Some of these incentives are alleged to distort competition and contravene technology neutrality and Community Law – we address these in 'The Legal Context' section

Early technical issues have been largely resolved

- Berlin showed that regional switch-over was feasible (first implementation):
  - limited geographical coverage helped distribution of STBs
  - it lowered the risk for broadcasters
- Successful model for switch-off that overcomes many of the difficulties in the transition to digital TV
- A Berlin-like regional switch-over model is being implemented in other parts of Germany, the UK and Sweden, and other Member States

Analysys

Digital television platforms for the future

Brussels, September 2005

What kind of digital future?

- The analogue terrestrial broadcast switch-off will result in many benefits such as higher-quality television and the freeing of spectrum, which may be used for other activities
- However, is it simply a case of replacing analogue terrestrial with digital terrestrial television, or should we replace analogue terrestrial with a mix of digital television platforms?
- We also review the various technology developments that will further improve the digital television offering, helping, in turn, in the migration towards digital television

Comparison of Digital TV platforms

Contribution of new digital technologies

Analogue terrestrial had traditionally been the dominant television platform ...

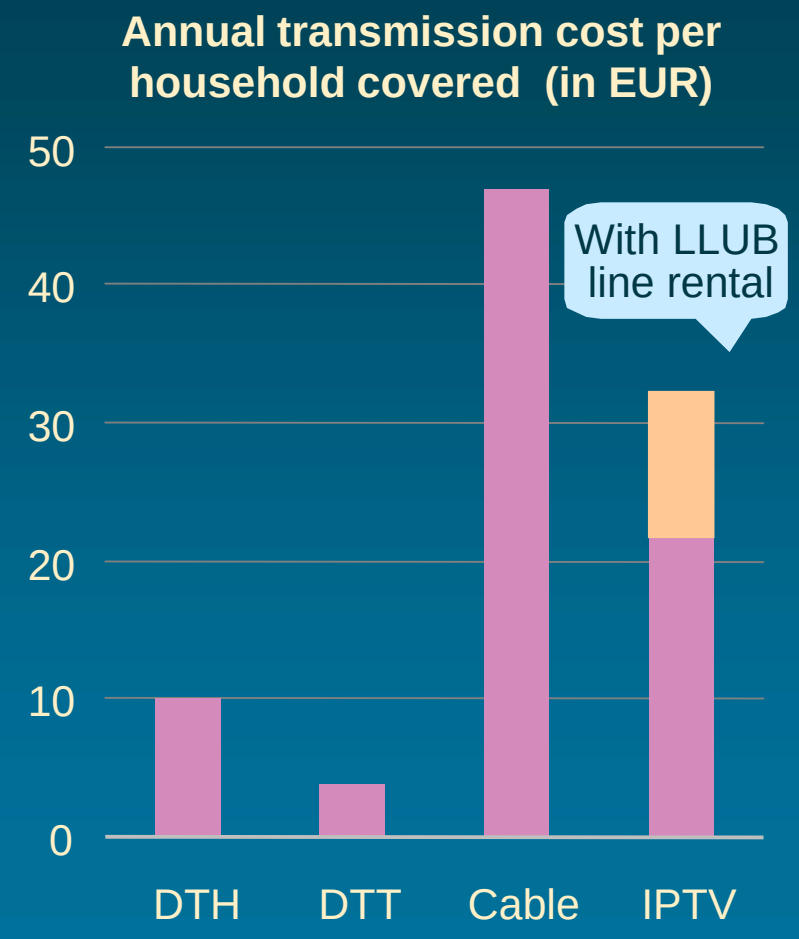
- Analogue terrestrial television networks require significant (scarce) spectrum resources
- Developments over the past two decades have led to various technology platforms being able to provide digital television:
  - many satellite (DTH) operators have been launched
  - analogue cable networks have been upgraded and new digital cable has been built
- More recently, broadband networks have established themselves as serious digital television platforms

... however, today, the digital television platforms offer greater potential

	ATTV	*DTT*	*DTH*	*Digital cable*	*IPTV*
Widespread coverage					
Capacity					
Local content					
Interactivity and ICT development					
CPE cost					
Robustness (against full failure)					
Reception means	Wireless	Wireless	Wireless	Wireline	Wireline

Wireline platforms incur in higher transmission costs than wireless platforms

- The chart opposite shows the comparative cost of providing full coverage to a small region similar to Berlin-Brandenburg*
- The chart assumes that none of the platforms is already deployed

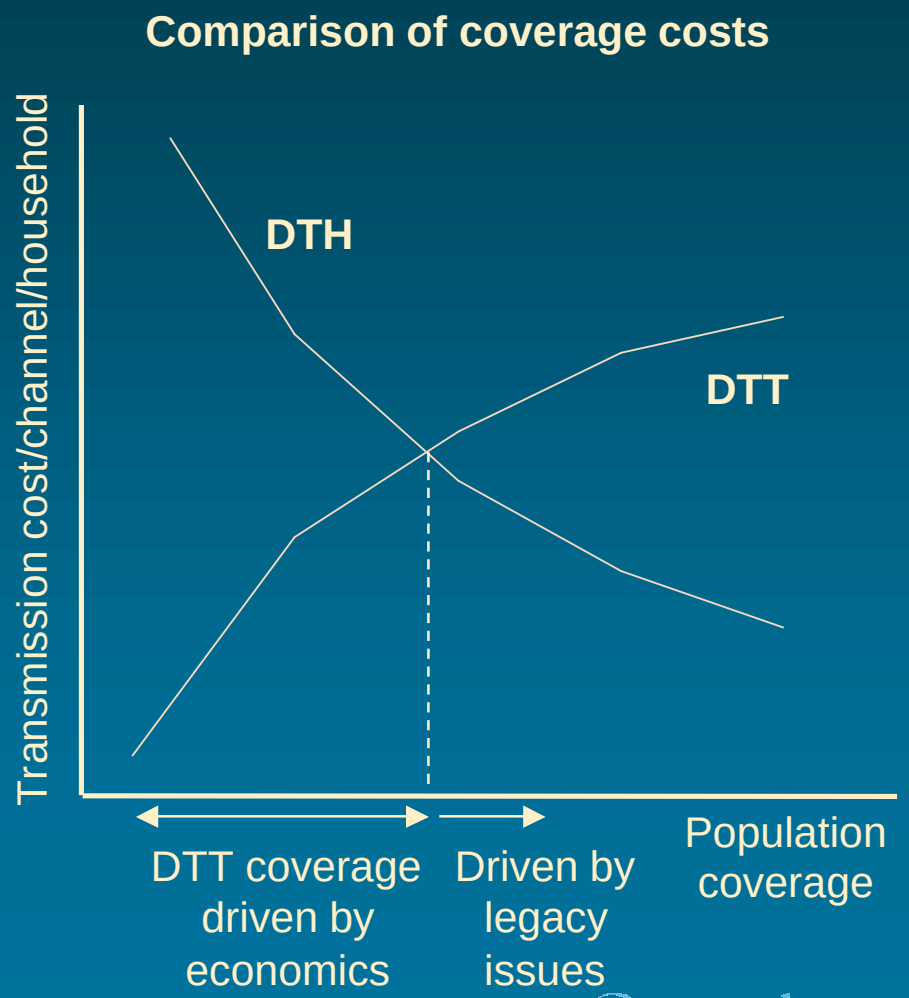


Source: Analysys

**Full details on the assumptions are available in the study report*

This makes DTH the only real alternative to DTT for coverage of non-urban areas ...

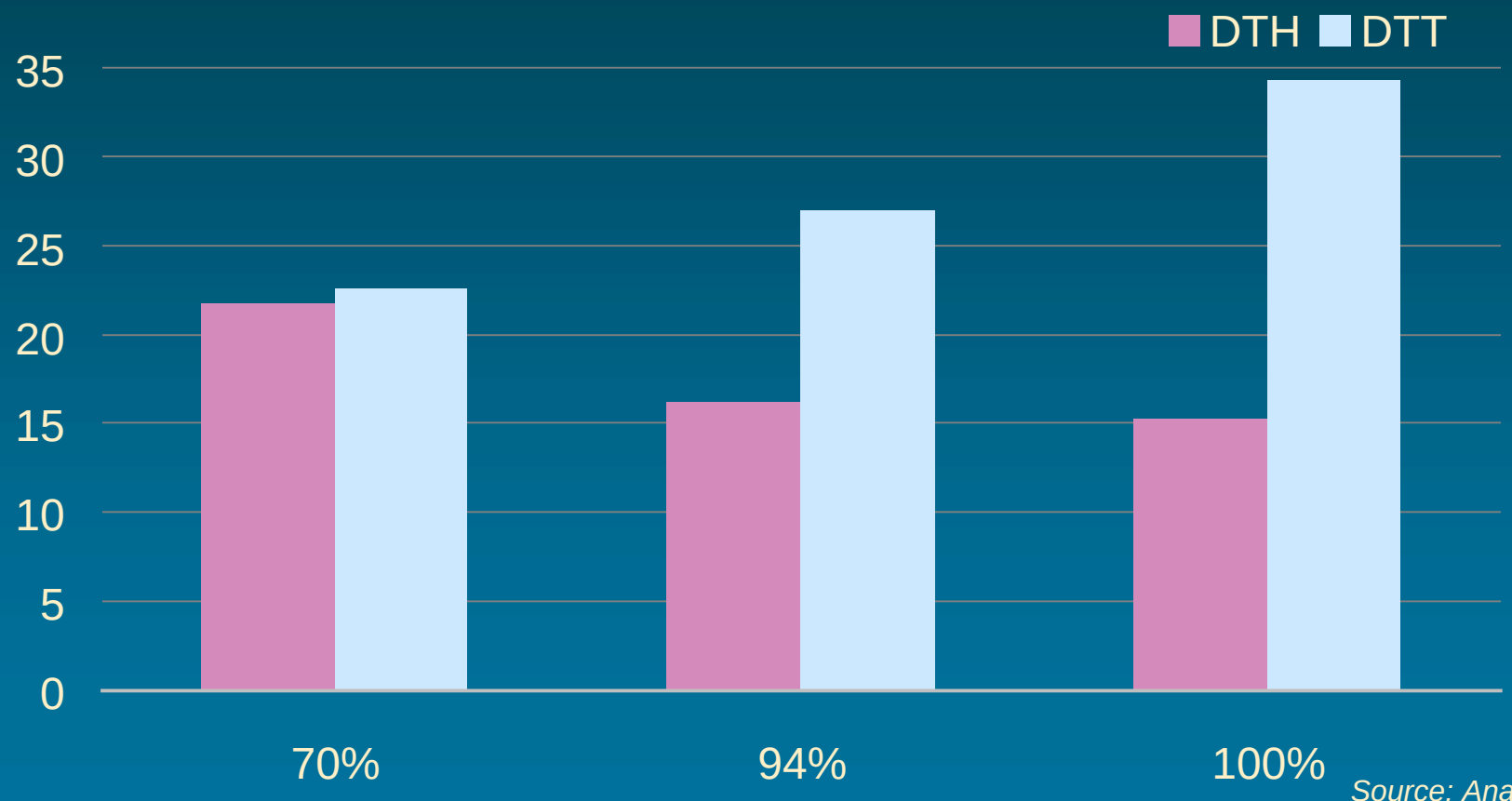
- Broadcasters will voluntarily provide digital television coverage in urban areas, driven by commercial motives:
  - the challenge lies in extending coverage to areas that may not be commercially attractive



Source: Analysys

... where DTH is more economical than DTT for providing coverage for medium-large countries*

Annual transmission cost per channel per household covered (in EUR) for medium-sized countries**



Source: Analysys

* In the case of small countries DTT may be cheaper
** Underlying assumptions detailed in report

The importance of DTH advantages depends on the existing scenario pre switchover

- DTH is the only platform that enables wide coverage from a point (single satellite)
- DTH may also broadcast a large number of channels
- However, these advantages may be neutralised in the migration from a scenario largely dominated by the ATTV platform ...
- ... where the following issues are of importance to PSBs:
  - DTH end-user costs may be much higher (given in-house wiring and antennas)
  - DTH may not enable local content to be easily broadcast
  - the risk of catastrophic satellite failure exists

Comparison of Digital TV platforms

Contribution of new digital technologies

HDTV delivers a richer viewing experience

- Benefits of HDTV include:
  - greater picture detail and sharpness as a result of the higher resolution
  - a wider picture adapted to the viewer's visual field
  - improved colour rendering
  - improved portrayal of motion
  - high-quality surround sound

A number of developments are taking place that may drive HDTV

- Rapid sales of flat-screen televisions
- Imminent launch of high-definition DVDs
- Competition between multi-channel television platforms leading the search for the next innovation in broadcasting
- Consumers are also being accustomed to paying for high-definition-like innovations, such as home cinema and wide-screen television

Successful HDTV implementation requires developments across the value chain

- The success of HDTV depends on relevant content being produced, the availability of transmission and affordable receivers for viewers

- This requires significant industry co-operation: if receivers are not available, broadcasters may not invest in transmission; without broadcasts, manufacturers may not promote receivers

Some technical issues need to be resolved …

- The transmission format needs to be decided. Despite advantages of progressive scanning, different views exist with the two principle candidates being:
  - 1080I: 1920 pixels x 1080 active lines with interlaced scanning
  - 720P: 1280 pixels x 720 active lines intermediate format with progressive scanning
- The greater number of pixels of 1080I leads to higher static resolution, while the progressive scanning of 720P leads to better motion portrayal
- 1080I also suffers from the current wide-screens (mostly wideXGA) unable to display the higher resolution

… and the European Commission aims to prevent market fragmentation

- Neither transmission format is likely to be universally adopted and uncertainty may limit market developments:
  - the only reasonable solution may be to require the receiver to be able to decode both formats
- The numerous technology options (both in transmission and the receivers) pose the risk of market fragmentation
- In order to avoid such fragmentation, market players, with the encouragement from the European Commission, are developing a ‘Roadmap on HDTV Technical Interoperability’

HDTV on terrestrial is unlikely to take off prior to analogue switch-off

- Currently, HDTV services are being provided across several platforms in different countries:
  - satellite – US, Japan, Korea and Europe
  - terrestrial – US, Canada, Australia and Japan
  - cable – primarily the US
- However, spectrum availability favours non-DTT platforms:
  - in Europe, before the analogue switch-off occurs, the terrestrial platform suffers from spectrum scarcity

DVB-H enables mobile reception on handheld terminals

- Despite the technical specification being complete since 2004, a number of challenges remain:
  - GSM900 incompatibility
  - spectrum availability
  - viable business model, notably vis-à-vis the investment on network and handsets
- DVB-H may share spectrum with DVB-T, but this imposes a number of limitations

Mobile DTT commercial deployments are still years away

- Trials of DTT via mobile handset have been undertaken in several countries, including Finland and Germany, to address technical and business model issues
- Plans for similar trials exist in the UK:
  - Mm02 and ntl have been undertaking a trial using DVB-H starting since spring 2005 with 500 customers
- There are alternative technologies for multimedia content delivery to mobiles:
  - DAB (and the related DMB)
  - TMMM (FLO) and ISDB-T

Advanced video coding will facilitate greater spectral efficiency, enabling HDTV and DVB-H

- MPEG2 has established itself as the key video encoding standard, however, at present, it allows little room for further improvement
- There are new coding algorithms with much higher efficiency, such as AVC and VC1:
  - standardisation issues may be resolved by implementation of both algorithms in devices
  - backward incompatibility with MPEG2 issues when there is already a large subscriber base

Analysys

The regulatory context and Community Law – recommendations of the study

Brussels, September 2005

The regulatory perspective

Providing Universal DTV coverage

Review of applicable legislation

Recent policy developments address the shortcomings of early ventures

- Early DTT ventures suffered from:
  - specification of an unviable business model
  - imposition of high-coverage obligations on commercial broadcasters
  - technical focus leading to expensive STBs
- In general, these issues have been largely addressed by recent regulatory developments

Spectrum efficiency, better quality and pluralism are key public objectives

- In all Member States, spectrum efficiency, better quality and pluralism are key public objectives
- However, some Member States differ substantially in their other DTT objectives:
  - **contribution to ICT development** (primarily in Southern and Eastern Europe)
  - **platform competition** (notably where cable penetration is high)
  - **public policy lever** (for instance, on the promotion of local content, notably in the smaller countries)

The treatment of DTT is influenced by the analogue terrestrial television conditions

- Access to the PSB channels on FTA analogue terrestrial television is considered to be a “right” in most Member States:
  - greater variance exists vis-à-vis CSB channels
- 12 of the 16 countries where there was universal access to PSB analogue channels are likely to require a similar coverage for these channels on the DTT platform:
  - ease of transition and equity have been cited as reasons for this decision
- France and Italy (2 of the 4 countries where universal access to PSB analogue channels is not available) have not yet decided on the means to achieve full DTV coverage

Content licensing and frequency right assignments are not totally decoupled

- There are different approaches to the licensing regime:
  - clear separation between content licences and multiplex (Mux) frequency assignments, as in the UK
  - intertwining of content licensing and Mux assignment:
    - in France, the CSA selects channels for inclusion in a Mux. The broadcasting operators on each Mux then select the network operator
    - in Italy and Spain, Mux have been assigned to individual broadcasters

Beauty contests are the dominant selection mechanism for assigning DTT frequencies

- 16 of the 19 countries where the selection mechanism has been debated are likely to use beauty contests:
  - Italy swapped national analogue frequencies for DTT
- Selection criteria often quoted include:
  - content commitments
  - financial viability
  - population coverage
  - technical capability
- Frequencies are typically assigned to broadcasters

Pluralism has been a key factor in the choice by some policymakers of a per-channel regime

- A slight majority of countries has chosen to assign them on a channel basis (11 to 7) rather than on a Mux basis:
  - the channel basis provides regulators with greater control over the content broadcast
- Additional measures to promote pluralism include:
  - licence commitments, e.g. UK Mux applications had to make commitments in terms of content
  - DTT capacity reservation for the PSB (the Netherlands, Sweden)
  - ownership rules and general competition law
  - specific rules on the use of the Mux capacity by the various broadcasters or for non-TV broadcast content

Some Member States believe that public funding has a role to play in the development of DTT ...

- The rationale lies on the substantial switching costs associated to DTT and the benefits to society
- The role may include:
  - funding of PSBs, by means of higher licence fees (Sweden, Ireland), proceeds from privatisation or asset sales (Finland, Italy), government budget (Austria)
  - consumers, subsidies towards cost of STBs
  - network operator, DTT roll-out investment subsidy
  - funding of CSBs

... although such funding can be controversial in a multi-platform world

- Even when the subsidy is for the PSB operator, there is a lack of transparency on the use of the funds:
  - analogue or digital service?
  - content development or transmission network?
- Subsidies towards CSB participation in DTT pose a bigger problem:
  - EC investigations are underway with respect to the the use of subsidies in Berlin and in Sweden

Member States have also used other measures aside from public funding to promote DTT

- Lower spectrum or concession fees than for analogue television (UK, Finland)
- “Must -carry” status on cable (France, Germany)
- Funding of trials (Belgium, Luxembourg, Spain and Slovakia) and interactive applications (Italy and Austria)
- The legal issues raised by the used of Public Funds or “must carry” are reviewed later in the presentation

PSBs are more likely than CSBs to play a lead role in the development of DTT

- In many countries, PSBs play a key role in the provision of content for the DTT platform, as well as in promoting the platform and using their technical capacity
- This contribution has fallen under the remit of the Public Service, and has typically been rewarded by means of DTT capacity reservation
- Some CSBs are also actively providing content to DTT, driven by lower transmission costs, availability of capacity or must-carry status
- Other CSBs may feel less inclined due to high penetration of competing platforms, CoI or limited financial resources

The regulatory perspective

Providing Universal DTV coverage

Review of applicable legislation

PSB universal coverage requirement could be implemented using market mechanisms ...

- USOs are similar to those on telecoms operators
- As telecoms operators, television broadcasters should also be allowed to chose the transmission network of their liking
- Instead of network decisions by policymakers, broadcasters could use market mechanisms (for example, tenders or auctions) to select the most appropriate transmission network:
  - in the EU today, CSBs are already largely allowed to choose the digital transmission network of their choice ...
  - ... but for PSBs, many still advocate a continued emphasis on the terrestrial network (e.g. Ofcom)

… and policymakers' role then be limited to decisions regarding content

- From a policy perspective, the required emphasis needs to be on deciding what and how much content (or channels) is in the public interest
- The choice of the network may then be made by broadcasters, on the merits of each technology:
  - doing this would be consistent with the principle of technology neutrality, a widely accepted concept guiding regulatory policy in Europe and beyond

Wireline platforms are unsuitable for universal coverage because of high transmission costs*

- Cable and IPTV can only make limited contribution to coverage in many Member States
- Wireline platforms compete based on capacity and interactivity
- In countries where no single platform is dominant, digital television may be delivered by a combination of platforms
- Wireline platforms may contribute to the digital migration by serving customers willing to pay towards the high cost of rolling out such networks

** Excluding countries such as the Netherlands and Belgium, where such platforms are already widespread*

The need for penetration imposes constraints in some countries …

- Analogue switch-off requires not only coverage but also high penetration (politically important before switch-off):
  - although falling STB prices help, further regulatory measures may be required to ensure take-up of STBs
- Where there is a high dependence on a specific platform, a rapid switch-off may only be achieved with a significant contribution from that platform:
  - in such countries, policymakers may consider alternatives risky and politically difficult to sell
- Thus, in some cases there may be a conflict between the principle of technology neutrality and objective of rapid analogue switch-off*

** The Community Law angle will be discussed later in this presentation*

…and transmission costs are not the only criteria when selecting the broadcasting network

- Network economics are not even the key factor in selecting the platform for non-urban areas:
  - transmission represents a limited part of a broadcaster's costs*
  - any discontent or reception difficulties from migration may be more important
- Terrestrial benefits from using an established, low end-user cost technology, allows local content to be broadcast and has proven to be broadly robust:
  - ... despite its shortcomings: limited capacity, dependence on scarce spectrum and difficult coverage of certain terrains
- Therefore, in most countries, PSBs are likely to adopt DTT, despite DTH advantages for providing coverage in non-urban areas

** 9% for Channel 4 in the UK (2004)*

The regulatory perspective

Providing Universal DTV coverage

Review of applicable legislation

Basic existing legislation affecting DTT may be split into three groups

- **Media regulation** – principally, the Television without Frontiers Directive
- **Electronic communications** – the Electronic Communications Framework Directive, associated directives and the Radio Spectrum Decision regulate transmission facilities and radio spectrum
- **Competition Law** – all areas of competition law impact DTT, including the Merger Control Regulation, Antitrust (Articles 81 and 82 EU Treaty), standards for services of general interest (Article 86 and State aid review (Article 87)

The Television without Frontiers Directive is a centrepiece of Community media law

- Basic policy:
  - “Services providing audiovisual content should be regulated according to their nature and not according to their means of delivery”
- Any revisions to the Television without Frontiers Directive that distinguish between linear (traditional) and non-linear (e.g., video-on-demand or information services) must assess impact on all platforms

The Electronic Communications Directive is of particular relevance to DTT

Directive	*Impact on digital television*
Framework	Identifies the broadcast transmission market for possible *ex ante* regulation
Access	Deals with accessibility issues relating to digital television platforms
Universal service	Addresses ‘must-carry’ considerations
Authorisation	Deals with radio frequency rights of use, allocation and authorisations
Spectrum decision	A toolbox of regulatory procedures for radio frequency issues

The Framework places particular emphasis on technology neutrality

- Technology neutrality is required by its objectives and principles
- The Broadcasting Transmissions Services to deliver broadcast content to end users is the last of the 18 markets identified in which to determine the existence of significant market power (SMP)
- Broad differences exist in those few (5) Member State determinations on Market 18 (Ireland, Austria, Finland, UK and Sweden)
- **Recommendation –** further guidance may be helpful, along with firm deadlines for national determinations

Universal Service – there are differences in the current applications of must-carry rules

- Application to DTT – extending legacy regulation and the risk of extending rules uncritically to new platforms:
  - general interest objectives clearly defined and proportionate
  - requirement for periodical review
- Alternative approach of “must offer” – many tricky policy questions
- **Recommendation** – assist Member States in determining best practice and common principles for defining objectives with respect to digital platforms
- **Recommendation** – review of the Universal Service Directive should focus on the justification for must-carry rules in the digital environment – implementation reviews should examine compliance with the directive, including the “periodical review”

** Germany, Sweden, UK, France*

All areas of Competition Law impact DTT

- Instruments of Competition Law include:
  - merger control regulation – often used for merger of digital platforms
  - antitrust (Articles 81 and 82)
  - State Aid rules (Articles 86, 87 and 88) – most relevant in general

First, determine if subsidies or funding are State Aid

- Granted by the State or through State resources
- Capable of distorting competition by favouring certain undertakings of production of certain goods
- Affect trade between Member States
- Interpretations would exclude must carry (no state resources) but apply to many forms of assistance, beyond outright subsidies

Second, determine if State compensation is not State Aid under *Altmark* ruling

- “Clearly defined” public service obligations are involved
- Parameters for compensation are set in advance in an objective and transparent manner
- No overcompensation
- Selection through a tender process or compensation set by reference to costs of a typical, well-run undertaking, including a reasonable profit

Third, determine that aid is compatible with State Aid rules as applied to a “service of a general economic interest”

- Service must be clearly defined (definition)
- Undertaking receiving the aid must be explicitly entrusted with task (entrustment)
- Measure must not affect Community trade and competition contrary to the common interest (proportionality)
- Resources for analysis include 2001 communication on State Aid rules for PSBs and 2005 “frequently asked questions” on PSBs

General-interest objectives – Services of General Economic Interest (SGEI)

- Importance in broadcasting field established by Amsterdam Protocol on Public Broadcasting
- “Broadcasting” as content, not transmission/distribution facilities
- A key question is to determine the amount of content that is in the public interest
- If the general-interest objectives have been met in the past through showing a specific number of channels, then the burden of showing why an expanded number of channels is justified on the Member States

We recommend dealing with the uncertainty associated to the various DTT proceedings

- Various proceedings are underway to review subsidies to DTT (Sweden, Germany, Austria):
  - **recommendation to expedite treatment of these cases**
- Active encouragement of digital switchover comes at the same time that there is review of compliance with competition rule in individual cases:
  - **recommendation to provide clarity on standards, guidance for DTT similar to general guidance for PSBs**

Digital switchover contributes to SGEI

- Contributes to new or improved broadcasting services
- In turn, contributes to fulfilment of SGEI objectives such as cultural diversity and media pluralism
- But DTT is only one of the possible platforms that can contribute to these objectives

Issues that arise when considering proportionality of digital switchover

- Choice of transmission mechanisms can include a mix of DTT and DTH or other means – could be left to market mechanisms
- Target timeframes must be respected for both coverage and penetration
- Reservation of spectrum for DTT follows traditional practice – but how much?
- Greater legal certainty and predictability needed

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