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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on the transition from analogue to digital broadcasting (from digital 'switchover' to analogue 'switch-off')

[SEC(2003)992]

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EXECUTIVE SUMMARY

'Switchover', i.e. the transition, from analogue to digital broadcasting is a complex process with social and economic **implications going well beyond the pure technical migration**. Digital broadcasting development is positive as it improves both the range and quality of services, notably thanks to digital compression. This increases both spectrum efficiency and network payloads.

This Communication addresses the switchover process, with a special focus on Member States' policies for digital TV migration. The Action Plan ***eEurope2005*** **requests Member States to publish their intentions** regarding switchover by December 2003. This Communication suggests the type of information that could be included in such reports.

Market forces and consumer demand must drive broadcasting digitisation, which is a major industrial challenge. Business freedom and incentives are instrumental to this goal. It is also crucial to inform consumers so that they know when to migrate and what the options are. This should be a market-led process, not a simple infrastructure change with no added value for citizens. Successful switchover will be facilitated by co-ordinated action from the numerous players involved – broadcasters, equipment manufacturers, retailers, governments and others.

Member State policy interventions should be transparent, justified, proportionate, and timely to minimise the risks of market distortion. They should be formulated according to clearly defined and specific policy goals and market difficulties. This requires careful impact assessment as well as monitoring of policy implementation and market evolution. Trying to force switchover against industry and users' interest may lead to unsustainable outcomes.

Member State policy interventions should also be non-discriminatory and technologically neutral. Differentiated treatment of market players must be justified. Digital TV switchover should be an inclusive process encompassing various networks, business models and services, including free-to-air TV, better picture quality or data and interactive services. Analogue switch-off should only take place when digital broadcasting has achieved almost universal penetration, taking all the above possibilities into account, to minimise social cost.

Policy intervention should take place at national level in the first instance, considering market and policy differences between Member States in the area of broadcasting. However, the EU has also a role to play, in particular in view of the internal market aspects. **Possible EU contributions** concern notably: benchmarking, equipment standards, consumer information, facilitating and promoting access to added value services. The Communication also proposes to launch a debate on spectrum aspects of switchover within the new Community spectrum policy framework. This would address possible approaches for greater transparency about the economic value of spectrum allocated to terrestrial broadcasting services. The top-level objective is to encourage efficient and flexible spectrum usage, while preserving the service mission of broadcasting.

It is not envisaged to propose a common switch-off date or the prohibition of selling analogue receivers at EU level. However, national digital broadcasting markets and policies will continue to be monitored.

Introduction

The present Communication analyses the main issues arising out of the migration from analogue to digital broadcasting from a market and policy perspective. Replacing analogue broadcasting with a system based on digital techniques presents huge advantages in terms of more efficient spectrum usage and increased transmission possibilities; these will lead to new services, wider consumer choice and enhanced competition. These advantages are underlined in the Action Plan *eEurope 2005*.[1]The objective of this Action Plan is to provide a favourable environment for private investment and for the creation of new jobs, to boost productivity, to modernise public services, and to give everyone the opportunity to participate in the global information society. eEurope 2005 therefore aims to stimulate secure services, applications and content based on a widely available broadband infrastructure.

In this context, the European Commission takes an active interest in the development of digital television and, more generally, in the future of digital broadcasting and in the migration to this new technology. However, the Commission does not take any position on the timing of analogue switch-off, which is a matter to be decided at the level of the Member States or of the regional authorities.

The first chapter of the Communication presents the market situation of digital broadcasting in the European Union; the many advantages are counterbalanced by a number of significant migration obstacles. This leads to a discussion of the circumstances that may justify policy intervention to address these obstacles and certain general requirements to be respected by such interventions.

The second chapter discusses the main options facing Member States, drawing on European law and market experience. This covers various aspects relating to national switchover strategies in general, and specific issues on digital broadcasting reception and services. Moreover, it reminds Member States that the Action Plan *eEurope 2005* requires them to *'publish by end 2003 their intentions regarding a possible switchover'* and provides them with guidance in this regard.

The third and final chapter addresses the spectrum implications of the move to digital broadcasting and suggests launching a wide debate on this issue, which will represent a significant component of any future Community spectrum policy.

1. SWITCHOVER OVERVIEW[2]

1.1. Benefits of digitisation and difficulties

In the field of television and radio (jointly referred to as 'broadcasting'), 'switchover' refers to the migration process from analogue to digital broadcasting, starting with the introduction of digital and ending with the switch-off of analogue broadcasting. Many routes are possible in terms of the speed and length of the process, the parties involved, and the degree of government intervention.

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1 COM(2002) 263 final, eEurope 2005: An information society for all.
http://europa.eu.int/information_society/eeurope/news_library/documents/eeurope2005/eeurope2005_en.pdf

2 Several issues in this section are developed in detail in a study by *BIPE consulting* for DG Information Society of the European Commission: *'Digital Switchover in Broadcasting'*, April 2002. The final study report was preceded by 2 public workshops and followed by one public consultation. See http://europa.eu.int/information_society/topics/telecoms/regulatory/studies/index_en.htm

Each country follows its own switchover path, often influenced by local broadcasting legacy. Ideally, the final analogue switch-off should take place when digital broadcasting has achieved widespread penetration and very few analogue homes remain. Otherwise the impact would be socially regressive, if many homes were simply deprived of TV or radio services; or economically damaging, if expensive or distorting public policy measures were implemented to avoid such a negative outcome.

Switchover implies much more than a technical migration. Considering the role of TV and radio in modern societies, that impact is not only economic but also social and political. Switchover affects all segments in the broadcasting value-chain, namely: content production, transmission and reception. All require technical upgrading to support digital broadcasts. The main challenge is on the reception side: to replace or upgrade the huge installed base of analogue receivers. This can be done with integrated digital television or radio receivers, or 'set-top-boxes' connected to the analogue TV set. Moreover, connection points (antennas, dishes, cabling) must often also be adapted.

The switchover cases for TV and radio are quite different. Digital TV market penetration is much greater. Analogue and digital TV are provided on various networks, mainly cable, satellite and terrestrial (over VHF and UHF frequency bands). Digital audio-visual content can be also supported by the internet and, still marginally, *Digital Subscriber Lines* ('DSL') networks. Each network has specific strengths and weaknesses. So television switchover is a 'multi-network' or 'multi-platform' process and digital TV is not synonymous with digital terrestrial TV. However, the debate often focuses on terrestrial TV because of the potential recovery of spectrum currently used by analogue terrestrial TV, and traditional government involvement in this area.

Nor is digital TV equal to interactive TV. The former concerns the type of communication network and is the focus of the present document; the latter refers to specific services that can be provided over that network. In practice, the roll-out of networks and services are related. Finally, digital TV is not just pay-TV; free-to-air digital TV offerings also exist in some Member States.[3]

As to the benefits of digital broadcasting, some are associated with the switchover process itself, others would be only achieved at the end, by stopping analogue broadcasts. All **benefits derive from the possibility of processing and compressing digital data**, making much more efficient use of network capacity than is the case with analogue signals. This can be exploited in several ways. First, it enables the offering of new or improved broadcasting services: additional programming; programme-related enhancements; better picture and audio quality; data and interactive services, including 'Information Society' and internet-like services.

Secondly, switch-off of analogue terrestrial TV could permit the release of several hundreds megahertz (MHz) in the VHF and UHF frequency bands,[4] which could be reallocated to various

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[3] As opposed to pay broadcasting, where users obtain access to additional or premium content against payment of a specific fee, e.g. regular subscription or 'pay-per-use'. Free-to-air broadcasting is available at no cost other than the fee paid by all users to receive the basic service broadcasting offer available in one given area.

[4] In the VHF (41-230 MHz) and UHF bands (470-960 MHz) slightly more than 500 MHz are allocated to terrestrial TV and radio in Europe. The frequencies reserved for analogue and digital TV are the same, unlike for radio. Satellite broadcasting uses higher frequencies, apparently without spectrum scarcity problems. According to *BIPE*, ibid., p. 22, switching off analogue terrestrial TV could release up to 300 MHz. This is because digital TV can be, depending on the parameters retained, 5 to 8 times more efficient than analogue TV. In other words, with quality remaining unchanged, 5 to 8 digital channels can be fitted in the same space occupied by one analogue channel. The potential spectrum gain is significantly lower in the case of radio.

uses, for instance convergent services combining features of mobile telephony and terrestrial broadcasting, such as mobile 'datacasting'. But before such time, switchover may actually aggravate spectrum scarcity insofar as analogue and digital broadcasts are 'simulcast' in parallel. So the duration of the switchover period is crucial, especially in areas where the spectrum space is over-crowded.

Thirdly, increasing market competition and innovation thanks to the potential arrival of new entrants at different levels in the value-chain, for instance new broadcasters or developers of interactive applications. In addition, switchover implies specific benefits for some categories of market players: reduction of transmission costs; opportunity for increased sales of digital receivers; easier storage and processing of content. In fact, the potential benefits and difficulties vary according to the stakeholders, as well as the local context and networks considered.

In any event, **in the shorter run, switchover involves significant costs** and difficulties associated with the need to: introduce technical upgrades in all segments of the value chain and review spectrum mechanisms and approaches; develop attractive services to drive demand, without which the overall process could be financially and politically unsustainable; and overcome scepticism and even resistance from some industrial players and citizens, who may see risks in changing the status quo in the broadcasting sector.

Currently, the migration to digital broadcasting has been affected by the situation in the information and communications sector, characterised by limited capital availability. This removes part of the pressure to accelerate switchover in order to release spectrum. Moreover, market potential for interactive TV and convergent services is taking time to materialise and consumer willingness to pay for this remains uncertain. In sum, progress is slower than anticipated and doubts are expressed about switch-off targets in certain countries. TV and radio broadcasts will be fully digital one day but it is difficult to know when and how. In some EU countries switchover could be a long process and its outcome is uncertain. For instance, the extent to which spectrum will be recovered and reallocated more efficiently will depend on political and market circumstances.

1.2. Status of digital broadcasting in the EU

1.2.1. Digital television

Digital TV was introduced in 1994 in the USA and in 1996 in Europe, first on satellite and soon after on cable and terrestrial networks, based on *Digital Video Broadcasting* ('DVB') specifications. The EU average household penetration was estimated in 2002 at 32 million (21%): satellite: 21.5 million (13.9%); cable 8.1 (5.2%); terrestrial 2.6 (1.7%).[5] Digitisation of satellite TV is market-led. Digitisation of cable is also largely driven by the market but the prospect of analogue switch-off is more distant than in the case of satellite. The most difficult switchover case is with terrestrial TV due to such factors as lack of spectrum in certain areas, cost of achieving wide coverage, relatively limited network capacity, competing TV offers already in place, and business mistakes.

[5] See details in annex 1.

The 'Television without frontiers' Directive[6] provides a common frame of reference for the provision of television services in the European Union. However, there are significant national differences, notably in relation to market variables like penetration of individual TV networks (terrestrial, cable and satellite) and business models (free-to-air versus pay-TV), but there are also differences between national policies regarding the migration to digital broadcasting.

So far, digital TV has mainly grown on the back of satellite pay-TV, with free-to-air still accounting for less than 20% of total digital TV viewing. In turn, pay-TV has been driven by multi-channel and premium programming, together with operators' subsidies for set-top-boxes. Pay-TV, and digital TV, has mostly developed in countries where analogue terrestrial TV was dominant and, unlike in cable TV countries, few channels were available. However the growth rate of pay-TV, and of digital TV therefore, has slowed down. It appears that many people will never subscribe to pay-TV for a variety of reasons (including the additional cost of pay TV and satisfaction with the range of free-to-air services), at least in its current form, especially in cable countries; so **digital TV needs new drivers beyond traditional pay-TV** and improved differentiation from analogue television, achieved through some combination of : more free-to-air - including terrestrial digital TV programming; better picture quality; data and interactive services; mobile and portable services.

1.2.2. Digital radio

The situation is more delicate for 'stand-alone' digital radio services; that is, services not bundled with digital TV service bouquets nor received over the internet. Unlike in the USA and other parts of the world, digital satellite radio services are not yet broadcast in Europe. Digital terrestrial radio broadcasts started in 1995, based on the *'Eureka-147 - Digital Audio Broadcasting'* ('DAB') standards. But there are almost no digital receivers on the market and therefore no listeners, although the situation started to improve in 2002, especially in the UK.

The main problem is to replace millions of analogue receivers, often very cheap, by more expensive digital receivers. Most consumers are not aware of digital radio and find analogue radio is good value for money. The added-value from digital radio, or at least the information available to consumers, does not yet seem sufficient to justify the additional cost for the average consumer, although prices are falling. In addition, subsidisation of receivers is difficult in Europe as the scope for pay radio is limited. Moreover, even if analogue radio switch-off did occur, little spectrum would be released in comparison with TV and it would likely be absorbed by increased demand for radio services.

In fact, both digital TV and radio are in most Member States still nascent markets, whose current difficulties are more commercial than technological. However, new projects continue to be launched, nearly all EU Member States have adopted policy measures to promote digital TV and many have done the same for digital radio.

1.3. Market complexity; plurality of scenarios and stakeholders

There is **no single switchover pattern or formula. Experiences vary according to the local circumstances and from one network to another**. Consequently, the general analysis provided here can only be a simplification. The switchover debate, and the present Communication, tends

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[6] Directive 89/552/EEC on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities, OJ L 298, 17.10.1989, p. 23, amended by Directive 97/36/EC, OJ L 202, 30.7.1997, p. 60, and currently under review. http://europa.eu.int/comm/avpolicy/regul/twf/newint_en.htm

to focus on terrestrial TV for two reasons: greater difficulties for a market-led digitisation than other networks; and higher political stakes and government involvement, mainly because of the pressure to recover spectrum, and a wide-spread perception associating terrestrial with universal free-to-air broadcasting services.

Switchover is a complex and long process involving many variables and affecting more or less directly many parties, namely: users/ consumers,[7] industry and public authorities. Each group can be further subdivided into smaller segments. For instance, users can be categorised according to their attitude towards digital TV: current or potential pay-TV subscribers, assuming that all pay-TV will be digital sooner or later; current or potential free-to-air digital TV viewers, who have bought or are ready to buy a digital receiver; viewers who will be always reluctant to adopt any form of digital TV, pay or free-to-air, for various reasons. The switchover strategies adopted will obviously determine, and be determined by, the respective percentage of each user category. In particular, the extent to which market forces alone can achieve digitisation will depend on the number and resilience of consumers reluctant to migrate to digital TV.

Switchover also concerns many industry players, such as content creators, service providers, network operators or equipment manufacturers. Some were already active in the analogue broadcasting market, others look for new business opportunities. Likewise, various departments in national and international administrations are interested in switchover insofar as it affects the achievement of policy objectives.

1.4. The case for public intervention

A key question is whether public authorities should intervene to accelerate switchover and/ or otherwise influence the process. That would be justified under **two premises:** first, the extent to which **general interests are at stake**; that is, how far there are potential benefits and/ or problems for the society as a whole, rather than just for certain groups or individuals. Secondly, **market failure**; that is, market forces alone fail to deliver in terms of collective welfare. In other words, market players' behaviour does not fully internalise switchover costs. Assessing the existence and intensity of both premises is largely a matter of political judgement by the competent authority, which, in the case of broadcasting, tends to be national and/ or regional authorities. In any case, such judgement should not be arbitrary but supported by sound market analysis.

As to general interests, potential benefits from digitisation can be oriented towards various policy goals: social, cultural, political, economic, etc. Usually there are trade-offs to make between them. For instance, part of the spectrum released by analogue switch-off could be redistributed in order to transfer this resource to operators who would use it to support different services or 'reinvested' in broadcasting to improve and extend the service.

The broadcasting sector is not comparable to any other sector, as it plays a central role in modern democratic societies, notably in the development and transmission of social values. Broadcasting offers a unique combination of features. Its widespread penetration provides almost complete coverage of the population across different broadcasting networks; provision of substantial quantities of news and current affairs together with cultural programming mean that it both influences and reflects public opinion and socio-cultural values. Switchover may affect these

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[7] The number of broadcasting users, i.e. viewers and listeners, potentially affected by switchover is much bigger than the number of consumers, i.e. those buying receivers and taking subscriptions. But it is the latter who will determine how far the switchover can be led by the market. For a detailed analysis of user attitudes to digital broadcasting see BIPE, ibid. Also for analysis of other players' positioning.

general interests. It will be important to ensure the continuing availability of a variety of television services, without discrimination and on the basis of equal opportunities, to all parts of the population. In particular, this is a pre-condition for public service broadcasters to fulfil their special obligations.

The likelihood of market failure is linked to the complexity of the environment where switchover takes place, and the interactions between the main parties involved. All have interests to defend and seek to influence the main variables: introduction or not of digital terrestrial TV, speed of the migration and switch-off timing, convenience and type of public intervention. However, co-ordinated action from the main stakeholders, rather than confrontation of individual strategies, is likely to lead to the collective optimum: a swift and efficient switch-off, with the minimum negative social and economic implications.

At least in the case of terrestrial television and radio, a series of structural failures hinder market co-operation and slow down switchover, notably 'free riding' behaviour,[8] oligopoly situations and 'chicken and egg' deadlocks. More specifically, the parties benefiting the most from switchover (equipment manufacturers or potential beneficiaries of released spectrum, including new broadcasters) may be different from those likely to bear the costs (final users or current broadcasters). So the latter have little incentive to internalise the costs and contribute to the switchover. Overcoming this kind of situation would require setting up co-ordination mechanisms to share benefits and costs between all parties involved, ideally with little or no public intervention. In this regard, public authorities, especially those responsible for competition law, must make careful judgements as to the right balance between market competition and co-operation between relevant parties. Those judgements must be based on clear understanding of both market dynamics and policy goals pursued.

1.4.1. Modalities

If the need for public intervention is established, decisions must be taken about its modalities, within a coherent switchover strategy. Any intervention should be transparent and proportionate as to the policy objectives pursued, market obstacles, and implementing details. This would provide certainty for all parties to prepare themselves and would limit the scope for arbitrary or discriminatory measures.

In particular, the Commission Communication "Towards a new framework for electronic Communications infrastructure and associated services - the 1999 communications review" established five principles for regulatory action. These principles were re-stated in the Communication on "principles and guidelines for the Community's audio-visual policy in the digital age"[9]. Regulation should:

- Be based on clearly defined policy objectives;

- Be the minimum necessary to meet those objectives;

- Further enhance legal certainty in a dynamic market;

- Aim to be technologically neutral;

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[8] Individual market players avoid contributing to switchover costs as they will anyway be able to enjoy the collective benefits associated with the process.

[9] COM (1999) 539 and COM (1999) 657 final, respectively available at http://europa.eu.int/ISPO/infosoc/telecompolicy/en/com9539en.pdf and http://europa.eu.int/comm/avpolicy/legis/key_doc/legispdffiles/av_en.pdf

- Be enforced as closely as possible to the activities being regulated.

A key area in national switchover strategies is the approach to digital broadcasting licensing and regulatory obligations attached thereto. This involves policy choices on network competition versus complementarity, number of operators, roll-out calendar and map, etc. Otherwise, there is a variety of possible intervention instruments and measures to encourage switchover, ranging from encouragement measures, like information campaigns, to compulsory ones, like analogue turn-off dates, or mandatory standards for equipment including digital tuners. They can also vary according to the parties targeted (consumers, equipment manufacturers, broadcasters, potential users of released spectrum, others). The impact of the planned measures should be evaluated through prospective economic analysis to ensure that the expected cost and benefits are fairly distributed; public policy should not lead to situations where some parties will be forced to bear most switchover costs whilst others will enjoy the benefits.

Timing is a key element of any intervention on switchover. Premature or late action can be useless and even counterproductive insofar as it introduces market distortion. Timely intervention requires good knowledge of market status and evolution, and therefore regular monitoring and analysis. In principle, an early switch-off is likely to be more controversial, but a more distant date may reduce any beneficial impact. In this connection, three main phases can be identified in TV switchover: the take-up phase driven by pay-TV, where sooner or later operators convert subscribers to digital; the consolidation phase, starting now in the countries where digital TV is the most advanced, where some consumers decide to equip themselves with digital devices to receive free-to-air digital TV; the closure phase, where users still not interested in any type of digital TV are forced to adopt it, with or without public support for the acquisition of a digital receiver.

Public intervention can support digital TV penetration in all three phases but stronger measures should be confined to the closure stage, after industry has made all possible efforts to increase consumer uptake. This requires that authorities ensure a favourable and predictable regulatory environment, and intensify their action when the market cannot deliver further. That may be the case when it is considered that digital broadcasting is not progressing quickly enough to achieve policy targets.

1.4.2. Risks

Broadcasting has a stronger tradition of policy intervention than other information and communication sectors like telecommunications, where the impact of liberalisation has been greater. This is justified by the political and social relevance of broadcasting content, which calls for the enforcement of minimum quality and pluralism requirements. Policy intervention is even greater in the case of terrestrial broadcasting because of its heavy use of spectrum, a scarce public resource, and the already-cited perception associating terrestrial with universal free-to-air TV services.

However, the contexts surrounding the introduction of analogue and digital broadcasting are very different. When analogue broadcasting was introduced, only the terrestrial option existed; there was no competition and the market was entirely shaped by regulatory intervention. Now, there are various types of networks, high market competition and faster technological change. Under these circumstances, the transition to digital broadcasting represents a big industrial challenge that must be led by the market. Intervention from public authorities to facilitate and supervise the process could be justified insofar as general interests are at stake.

The risks from both public intervention or absence of it must be assessed. Non-intervention can result in market failure and jeopardise general interest goals in the sense explained above. As to the risk from public intervention, it includes policy-driven approaches captured by industrial parties seeking to offset commercial risk, thus reducing competition and pressure to innovate. This could result in perverse effects, like 'moral hazard'[10] or market inaction, and ultimately slow the switchover process down. In practice, these parties may exaggerate the advantages from digital broadcasting, mixing private and collective benefits. Then, they might persuade authorities to support them (legally, financially or otherwise) in the name of general interests to gain a competitive edge over rivals. If not transparently justified, this could distort the market.

Moreover, public intervention, or the simple announcement of it, that turns out to be inappropriate for any reason (disproportionate, discriminatory, untimely, etc) can be counterproductive. It can create additional obstacles to digital broadcasting uptake, by stimulating an appetite for more public intervention than would have been necessary otherwise. For instance, if a government announces too early that digital receivers will be offered to all remaining analogue users shortly before analogue switch-off, there will be little incentive for those users to buy receivers. Also, untimely imposition of technical standards that are immature or require costly implementation may discourage investment. Finally, all intervention by national authorities must be compatible with EU law, in particular on the internal market and competition law.

2. POLICY ORIENTATIONS

As explained, market forces must drive the switchover process focusing on users. **The challenge is to stimulate demand so that it is a service-led process rather than a simple infrastructure change with no perceived added-value for citizens**. Consequently, the various consumer segments must be offered packages of services and equipment that are attractive to them; that is, stimulating, user-friendly and affordable. This is primarily a task for market players.

There is however also scope for policy intervention considering the social and industrial general interest at stake, and that some key elements of the process are the responsibility of public authorities. Such intervention must be conducted in the first instance by national and/ or regional authorities, who are the most directly responsible for broadcasting content policy and licensing. But EU institutions have increasing responsibilities in relevant areas such as electronic communication networks, including broadcasting networks. They can also contribute to switchover within the limits of subsidiarity. European co-ordination can improve policy certainty, facilitate economies of scale in equipment, and ultimately reduce market fragmentation. Indeed, some Community competencies related to the internal market are relevant for switchover. Ultimately, switchover implies an industrial transition where the challenge is to ally cultural diversity of Member States with critical mass from the European internal market.

This chapter addresses general strategy and co-ordination in section 2.1, and in section 2.2 suggests policy orientations for Member States to facilitate the switchover. This should help them fulfil the requirement in the Action Plan *eEurope 2005* to *'publish by end 2003 their intentions*

[10] 'Moral hazard' is a term from financial regulation describing a situation where investors behave recklessly because they know the central bank will not allow them to go bankrupt.

regarding a possible switchover'.[11] As in *eEurope*, the focus here is on TV, but many considerations are also relevant for radio.

Any EU contribution needs to take into account subsidiarity and the specificities of national broadcasting markets and policies. Consequently, it is not appropriate for the EU to adopt measures envisaged in some countries, in or outside the EU, such as a common target date for analogue switch-off or mandatory digital receivers. However, the EU will continue monitoring switchover and supporting digital broadcasting developments in Europe.[12]

Spectrum issues are dealt with in a separate chapter in view of their relevance and the opportunity of launching a wider European debate in this area.

2.1. General strategy and co-ordination

2.1.1. Transparent strategy and monitoring

As indicated, policy transparency improves certainty for market players (including consumers), encourages co-ordinated action, and ultimately facilitates the switchover. *eEurope 2005* therefore calls upon Member States to publish by end 2003 their intentions regarding a possible switchover. This could cover, in particular, the way they organise and monitor the process, stakeholders' involvement, and policy instruments intended to promote switchover.[13]

At EU level, comparison of national experiences and regular monitoring would provide useful information on policy and market status. This would feed into the EU policy-making process, helping identify possible actions to develop internal market synergies. The Commission will also continue gathering data on the EU digital TV market on a yearly basis, as in 2001 and 2002.[14]

2.1.2. Regulation allowing for business autonomy and co-operation

Developing digital broadcasting markets is a complex process requiring significant investment from many players to: roll-out networks, develop enabling technologies, sell terminals, offer compelling services, and encourage user uptake. Industry must have incentives to invest and autonomy to search for winning formulas. This requires a stable regulatory environment, including licensing terms for service operators with a duration that enables an appropriate return on investment, taking into account the additional costs caused by the transition, and with the possibility of licence renewal so as to provide an adequate incentive. Licensing terms should also facilitate provision of sufficient network capacity to support a variety of services.

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[11] ***Digital switchover***. *In order to speed up the transition to digital television, Member States should create transparency as far as the conditions for the envisaged switchover are concerned. Member States should publish by end 2003 their intentions regarding a possible switchover. These could include a road map, and an assessment of market conditions, and possibly a date for the closure of analogue terrestrial television broadcasting which would enable the recovery and refarming of frequencies. National switchover plans should also be an opportunity to demonstrate a platform-neutral approach to digital television, taking into account competing delivery mechanisms (primarily satellite, cable and terrestrial).*
COM(2002) 263 final, eEurope 2005: An information society for all**.**
http://europa.eu.int/information_society/eeurope/news_library/documents/eeurope2005/eeurope2005_en.pdf

[12] This approach is also in line with the European Parliament call for *"the Commission and the Member States to make the development of digital television and the availability of digital television to the public at large a top priority on the political agenda"*. See point 1 of European Parliament Resolution B5-0488/2002
http://www3.europarl.eu.int/omk/omnsapir.so/pv2?PRG=TITRE&APP=PV2&LANGUE=EN&TYPEF=TITRE&YEAR=02&Find=digital+television&FILE=BIBLIO&PLAGE=1

[13] More detailed suggestions on the information to supply in this context are given in annex 2.

[14] See the *report on the implementation of the communications regulatory package*
http://europa.eu.int/information_society/topics/telecoms/implementation/annual_report/8threport/index_en.htm

However, authorities should monitor market evolution, consult with industry, and be ready to review or flexibly interpret conditions relevant to switchover where justified, for example conditions concerning the calendar for roll-out and territorial coverage, technical choices on transmission and terminals, ownership thresholds, price caps, taxes, simulcast extent and timing, or obligations to provide certain programming. Authorities may have trade-offs to make between a faster switchover and other policy objectives, for instance regarding the degree of pluralism, and they need to consider the impact of policy choices on market competition. The challenge is to find the right balance between different policy objectives while respecting legal requirements, in order to maximise collective welfare. For instance, as argued below, co-ordination and co-operation between different industries is important for switchover. However, all forms of industry co-operation remain subject to EC competition law scrutiny. While various public policy objectives can be taken into consideration in this context, competent authorities must ensure maximum transparency regarding such objectives and the necessary means to achieve them. This should go beyond vague references to the goal of digital switchover and/or the Information Society.

Co-ordinated and synchronised action may be necessary to achieve critical mass. Co-operation between industry players at various levels of the value-chain must be therefore facilitated, especially in the initial market stages, which imply trial and error testing. This can be organised through joint investment and risk sharing schemes for technological research, launch of new equipment and services, and promotion. Authorities may contribute through financing or regulation, as is done in some Member States for both digital TV and radio.

Co-ordination is particularly relevant in horizontal markets, such as free-to-air broadcasting. Unlike pay broadcasting, no dominant party controls the value-chain and 'free-riding' behaviour can result in collective business failure. Sharing responsibility for commercial promotion and consumer after-sale service, notably in face of difficulties with signal reception or receiver equipment, is particularly important.

In the case of digital radio, apart from favourable regulatory frameworks in the Member States, it appears that synchronised implementation across the EU is important to increase internal market synergies. Member States' attention is drawn to the recommendations adopted by the *'Open Network Provision'* Committee in 2002 on the *'regulatory treatment of digital radio in the Member States'*.[15]

2.1.3. Proportionate and technologically neutral regulation

In terms of political feasibility, switch-off in a given territory can only take place when nearly all households receive digital services. In order to promote the fast and efficient achievement of this objective, **all transmission networks should be taken into account** (primarily cable, satellite or terrestrial).[16] This approach recognises that network competition contributes to the roll-out process. This is in line with the spirit of *'new regulatory framework for electronic communications'*,[17] which is based on market initiative and technological neutrality. It encourages facilities-based competition and investment, thus contributing to the multi-platform

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15 See working documents ONP-DBEG 02-12Rev1 and ONP-DBEG 02-13Rev2 at http://europa.eu.int/information_society/topics/telecoms/regulatory/digital_broadcasting/index_en.htm

16 An alternative approach would be to measure total household penetration only for one network, usually the one that was dominant in analogue; terrestrial or cable, depending on the Member State. Moreover, there is a debate in some countries on how to calculate penetration; whether the criterion should be one digital receiver per household or the conversion of all receivers in the household to digital, the secondary reception issue. See also first paragraph in section 2.2 and accompanying footnote 20.

17 http://europa.eu.int/information_society/topics/telecoms/regulatory/maindocs/index_en.htm#directives

approach of *eEurope*. This implies a regulatory level playing field. In principle, each network should compete on its own strengths. Any public support for one particular option cannot be excluded but should be justified by well-defined general interests, and implemented in a proportionate way. Otherwise it would appear discriminatory and could jeopardise investments in other networks. In particular, each individual network should not necessarily enjoy the same position in the digital landscape as in the analogue landscape. The objective should be to achieve a fast and efficient switchover. Efficiency should include preserving the general interest missions of broadcasting, while limiting public expense.

Finally, any public financial support to digital broadcasting needs to be compatible with State aids rules under European law, as well as Commission orientations on the use of structural funds.

2.2. Digital reception

Ensuring that most users are equipped with digital receivers is the main challenge for switchover and a pre-condition for switch-off. Finding a solution for all receivers in the home, not just the main receiver, just adds to the challenge.[18] The two basic options are digital converters or set-top-boxes connected to analogue receivers, and integrated digital receivers. Moreover, additional reception facilities such as cabling, antennas, dishes, etc are often necessary.

There must be a large range of digital reception solutions to suit various user segments. This means choice of functionality, price and commercial formulas. Equipment cost is not a major barrier to the consumer of pay-TV services since European pay-TV operators subsidise it, having already deployed millions of set-top-boxes. However, the widespread penetration of digital TV will not be achieved by pay-TV only. Now the main challenge concerns the creation of 'horizontal' markets for unsubsidised receivers supporting free-to-air digital TV services, where consumers pay the full cost from day one. Co-existence of the two business models is important for wide-spread digital TV market penetration.

Availability of cheap receivers is essential to minimise entry barriers for consumers. Most of them must be equipped before the switch-off can take place. Equipment costs should not be much higher than in analogue and services at least comparable, thus offering a cheap entry point to digital TV. This is the way the market seems to go now. Of course consumers should also have options to buy expensive equipment supporting sophisticated services. Service and equipment diversity also contributes to wide-spread digital TV market penetration.

2.2.1. Encouragement to deployment of digital receivers

Free movement of goods within the internal market requires that national authorities do not impose administrative constraints for commercialising digital broadcasting equipment and compulsory technical requirements without previously informing the European Commission.[19] Where such requirements would be necessary, they should be introduced Community wide and be based on European standards. In particular, Member States should encourage the voluntary implementation of standards or specifications mentioned in the *'List of standards and/or specifications for electronic communications networks, services and associated facilities and*

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[18] Digital terrestrial TV is the option most often considered for secondary reception but there are others, e.g. home networks conveying cable or satellite transmissions. It is difficult to anticipate market outcomes.

[19] Such measures must be in any case notified to the Commission pursuant to Directive 98/34/EC as modified by Directive 98/48/EC on '*the provision of information in the field of technical standards and regulations'* OJ L 204, 21.7 1998, p. 37 and OJ L 217, 5.8.1998, p. 37.

services' (the 'List of standards'),[20] consulting interested industries and consumer associations as appropriate.

Some EU Member States envisage public subsidies for digital equipment through schemes aimed at the whole population or just specific groups. Apart from possible concerns with regard to EU competition law, the risk with the first scheme is discouraging purchases, including purchases of more sophisticated equipment than the one subsidised. The risk with the second scheme is trading of devices between subsidised and unsubsidised population groups.[21]

Several other forms of incentives have been considered by some Member States, for instance temporary and degressive reduction of the licence fee for homes with digital equipment to encourage fast digital migration, etc. Some Member States allow a reduced rate of VAT on pay-per-view and subscription broadcasting services. The financial implications and parties affected are different, so each option should be carefully analysed and implemented. In any event, these measures must comply with EC competition law, in particular State aid rules, and should not be a source of tax induced distortions.

2.2.2. Consumer information on digital equipment and switchover

Consumer information is crucial to drive digital equipment sales in a market-led approach to switchover. Consumers should be empowered to plan their own migration rather than being forced and thus deprived by this process. They should be well-informed of the timing and consequences of switchover so as to take their own decisions on services and equipment from a wide range of choices. They must be aware of what various devices can offer, what are the prospects of analogue equipment obsolescence and the possibilities for upgrading. Information and labelling should also be available in accessible formats for consumers with disabilities.

Informing consumers is the responsibility of equipment manufacturers, retailers and service providers, who need to co-ordinate their action and send clear messages whilst respecting competition law. Labelling schemes for analogue and digital equipment, with explanatory notices and/ or logos, based on voluntary industry commitment, would be particularly useful. The goal would be to send consumers positive and negative signals about, respectively, digital-compliant and analogue-only receiver equipment. This information should mirror national switchover policies, including indicative national or regional switch-off dates. Especially as an analogue switch-off date approaches in a particular Member State, its consumers should be clearly warned about the risks of equipment obsolescence.

Policy intervention in this area has been proposed in some EU and third countries. However, Member States cannot impose *de jure* or *de facto* compulsory labelling schemes[22] without prior notification under Directive 98/34/EC , as modified by Directive 98/48/EC. Notification enables a compatibility assessment of such measures with internal market rules to be undertaken. Where necessary, a certain degree of Community harmonisation could be envisaged so that the approach to labelling would be common whilst tailoring its implementation to local circumstances, such as national switch-off dates. Labelling specifications could be approved by European consumer and standardisation bodies.

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[20] OJ C 331, 31.12.2002, p. 32. http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=52002XC1231(02)&model=guichett

[21] The Berlin/ Brandenburg switchover project includes public-funded receivers for certain households.

[22] The definition of measures that are compulsory *de jure* or *de facto* can be found in Article 1(11) of Directive 98/34/EC. See footnote 19 for full reference.

2.2.3. Integrated digital television receivers

The prohibition of selling analogue-only television receivers according to a staggered calendar has been recently approved in the United States and debated in some EU Member States. It is however difficult to envisage something similar in the EU. Indeed, whereas there are big differences between the EU national markets, all countries would have to implement the obligation more or less simultaneously to preserve homogeneity within the internal market. This would have greater impact in countries where digital penetration remains low and strain the principle of subsidiarity traditionally applied in broadcasting policy.

Another potential drawback of compulsory integrated digital receivers would be the extra cost for consumers which, depending on the exact technical requirements, could however be partly offset by economies of scale. The impact would be greater in those countries where digital TV is less developed, notably some of those joining the EU in 2004. Concerns have been also raised as to the technological neutrality of the measure. If only one type of digital tuner were to be mandated, this would presumably favour the dominant analogue TV network, often terrestrial.[23]

2.2.4. Digital connectivity

Currently, digital TV signals are almost always displayed on analogue TV sets connected to a digital set-top-box, which decodes those signals, through the analogue 'SCART'[24] socket or connector. That means digital signals are converted into analogue signals before being displayed. This is acceptable for today's television receivers, based on cathode ray tubes and small screen sizes. However, the quality penalty is more perceptible on big screens using new digital display technologies. Moreover, the lack of systematically implemented and enabled digital connectors prevents the transfer of digital information between digital TV receivers and other digital devices in the home. But digital connectivity raises copyright security concerns, in particular that insufficiently protected digital content could be illegally copied or distributed.

The possibilities for implementing digital connectors should be further explored as an incentive to consumer equipment switchover, in line with recital 33 of the new 'Universal Service' Directive stating that *"it is desirable to enable consumers to achieve the fullest connectivity possible to digital television sets."*[25] A number of options exist to interconnect digital TV equipment, fulfilling different requirements[26] but it is still unclear which way the market will go and mandating a particular solution would be premature at this stage. However, recommended options could be signalled in the List of standards. Also the EU *Information Society Technologies* ('IST') programme will continue supporting R&D projects on areas relevant to digital TV interconnection, for instance on copyright protection or home networks. The Commission is also following the evolution of technical specifications in the relevant industry consortia and standards bodies.

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23 Cable, satellite and terrestrial networks require receivers with a specific tuner and, so far, it has in general been uneconomical to incorporate more than one digital tuner within the same receiver, except in the most costly products.

24 'SCART' stands for 'Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs'.

25 Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services. OJ L 108, 24.4.2002, p. 51. http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/documents/l_10820020424en00510077.pdf

26 Common Interface, Ethernet, IEEE1394, USB, DVI, etc.

2.2.5. *Interoperability of services*

Regarding more sophisticated functionalities such as *Application Programme Interfaces* ('API'), interoperable and open solutions for interactive TV services must be encouraged in accordance to Article 18 of the 'Framework Directive'.[27] Pursuant to this Article, the Commission will review the market situation by July 2004 and decide whether it is necessary to mandate certain standards to improve interoperability and freedom of choice for users. Indeed, these two criteria will likely contribute to consumer uptake of digital broadcasting in a market-led switchover scenario, thus minimising the need for public intervention.

2.2.6. *Access for users with special needs*

Access to digital broadcasting should include citizens with special needs, notably people with disabilities and older persons. This is also in line with the *eEurope 2005* action on 'interactive public services' to provide access to government services to all citizens through various platforms.[28] However, while digital broadcasting offers greater possibilities than analogue in this area, these are not yet supported by digital equipment on the market. Harmonised EU approaches can reduce costs through economies of scale, thus facilitating the marketing of relevant functionalities.[29] This will be addressed through the new working group on access by users with disabilities to electronic communications services, under the responsibility of the EU *Communications Committee.*

2.2.7. *Removal of obstacles to the reception of digital broadcasting*

Infrastructure competition stimulates market development, increasing consumer choice, quality of service and price competition. This may be constrained in some areas by legal, administrative or contractual restrictions on the deployment of infrastructure or reception facilities.[30] Authorities will need to arbitrate between promoting digital broadcasting and the fundamental freedom to receive information and services, therefore facilitating network competition, and other policy objectives on town planning, environmental protection or other areas. With that proviso, national authorities should encourage network competition. By way of example, some Member States have already adopted measures in support of this objective, for instance by requiring the provision of multi-network reception facilities in new apartment blocks, facilitating their installation in existing blocks (for instance by reducing the required threshold of tenants' votes), or by removing restrictive clauses in property or renting contracts. Co-ordination between national and local authorities is important since local authorities are often responsible for the practical implementation of this type of measure.

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27 Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services. OJ L 108, 24.4.2002, p. 33.
http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/documents/l_10820020424en00330050.pdf

28 Op. cit*., p. 11.*

29 This would help improve the current situation where services, guides and interfaces frequently require simultaneous visual, hearing and dexterity capabilities. Development of multi-modal content in order to use different alternative communication functions (audio description, sign language, teletext, easy navigation, personalisation of interfaces, etc) should be encouraged.

30 The Commission adopted a Communication on this subject in 2001; Communication from the Commission on the application of the general principles of free movement of goods and services – articles 28 and 49 EC – concerning the use of satellite dishes, COM(2001)351final of 27.06.2001.
http://europa.eu.int/comm/internal_market/en/media/satdish/index.htm

2.3. Services

Services, not technology drive demand for digital broadcasting. Proposing attractive services is the responsibility of the market, but some policy interventions can contribute. In general, legal requirements and obligations on digital broadcasting content should not be more burdensome than, or duplicate, those imposed on analogue content.

2.3.1. 'Must carry' obligations

In many Member States, obligations to transmit certain channels ('must carry') have been traditionally imposed on certain networks. Certain broadcasters argue that extension of must carry obligations to digital networks will help switchover since users expect to find there at least the same service they have in analogue. But networks operators express concerns about the proportionality of these measures and the absence of appropriate compensation. In any event, must carry obligations will have to comply with Article 31 of the new Universal Service Directive, and in particular be: necessary to meet clearly defined general interest objectives, proportionate and transparent. The Commission services will provide guidance on must carry in the course of 2003.

2.3.2. Copyright

As a general rule, digital simulcast of a copyright protected service results in a right to additional copyright payments even though few or no additional viewers are involved. Such demands may be perceived as a disincentive to provide or extend digital services. Right holders, including their representatives, should be encouraged to offer appropriate terms for simulcasts of analogue and digital through the same delivery mechanism where migration is the aim. Future copyright licences should also facilitate modifications or enrichment of services and data to improve accessibility for users with special needs.

Developments in digital broadcasting can be also constrained by the inability of EU citizens to legally obtain access to TV programmes other than those originating in the Member State where they reside. Although such access is technically possible, it is, in some instances, not authorised by right holders, given the territorial nature of copyright.[31] The European Parliament, the Commission and complaints from EU citizens have drawn the attention to this situation (as regards satellite broadcasting) and expressed the desire to improve it.[32] This issue is included in the programme for review of the 'CabSat' Directive in 2003.[33] It will also be addressed in the forthcoming Commission Communication on the management of Copyright and Related rights and is mentioned in section 4.4. of the Commission report on legal protection of electronic pay services.[34]

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31 Satellite-TV operators often encrypt their digital service in order to ensure remuneration and/or to limit viewing to a specific territory.

32 See European Parliament Resolution FINAL A5-0143/2000 (full reference in annex), points 12-14 http://www2.europarl.eu.int/omk/OM-Europarl?PROG=REPORT&L=EN&PUBREF=-//EP//TEXT+REPORT+A5-2000-0143+0+NOT+SGML+V0//EN

33 Directive 93/83/EEC on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission. OJ L 248 , 6.10.1993, p. 15. See also report from the Commission on the application of the mentioned Directive, COM(2002)430 final of 26.7.2002. http://europa.eu.int/comm/internal_market/en/media/cabsat/index.htm

34 Report from the European Commission on the implementation of Directive 98/84/EC on the legal protection of services based on, and consisting of, conditional access, COM(2003) 198 final of 24.04.2003. http://europa.eu.int/comm/internal_market/en/media/condac/functioning/index.htm

2.3.3. Diversity of digital broadcasting services

Digital broadcasting will attract different consumer segments if it is associated with a variety of services not available, or only partially, in analogue, such as portable and mobile reception; increased audio and picture quality, including wide-screen and high-definition television; data and interactive services, notably 'Information Society services'. Such digital service diversity is helpful for extending the appeal of digital TV beyond multi-channel and premium pay services. These have been the predominant digital TV services since the beginning of the market, but are usually not a driver where analogue multi-channel is available. Maximising digital service diversity will help ensure differentiation from analogue and serve the needs of population segments and markets that are interested in other types of digital television services.

The Commission Communication on 'barriers to information society services through open platforms'[35] identifies a series of follow-up actions to provide legal certainty, facilitate investment and stimulate consumer uptake particularly for data, interactive and transactional services on TV networks, notably by: clarifying the regulation applicable to information society services and those responsible for its implementation, ensuring consistency across the EU; improving the security of digital content, notably through technological research on digital rights management systems; promoting consumer trust and confidence by ensuring data privacy and security, especially for financial transactions.

In addition, public authorities can encourage the availability of added value content on TV networks in different ways. First, ensuring government information is increasingly available, in line with the *eEurope2005* call for Member States to exploit by end 2004 the potential of multi-platform access for basic public services in the mentioned action on 'interactive public services', and the proposed Directive on the re-use of public sector information.[36] Much of this information is very valuable to citizens and often cheaply available. It is possible to build on the work done on e-government and ensure the information is formatted to be displayed on TV in accessible formats. EU action can provide critical mass and reduce costs thanks to economies of scale. This implies interoperable and horizontal solutions, as 'platform-agnostic' as possible, to facilitate exchanges between administrations.

Secondly, various EU initiatives in the areas of *e-content*, *e-government*, *e-learning*, *e-health*,[37] and the *IST* research programme, can support public-private partnerships regarding the provision of added value content, government-related or not, on digital broadcasting networks.

Thirdly, service competition can be stimulated through the implementation of EU regulatory provisions on third party access to electronic communication networks and facilities, notably Article 5 of the 'Access and Interconnection' Directive.[38] Services concerned can include traditional broadcast programming but also interactive services, such as messaging services allowing for interaction between users, thus stimulating uptake through direct network effects.

Finally, a forthcoming Commission Services Working Document will examine the role of screen formats - wide-screen and high definition - in stimulating the consumer take-up of digital television.

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35 COM(2003) 410 final of 9.7.2003.

36 COM(2002) 207 final - 2002/0123 (COD). To be adopted.

37 See http://europa.eu.int/information_society/eeurope/action_plan/index_en.htm

38 Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities. OJ L 108, 24.4.2002, p. 7. http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/documents/l_10820020424en00070020.pdf

3. SPECTRUM MANAGEMENT

Terrestrial broadcasting spectrum is **both one important justification and challenge for switchover**. As explained in the first chapter, the closure of analogue broadcasting offers the prospect of releasing several hundreds MHz of "prime" spectrum[39]. This is a substantial amount of spectrum, comparable for instance to all the frequencies used by cellular networks in Europe. But before getting there, it is necessary to manage a scenario of spectrum scarcity during a more or less long simulcast phase where analogue and digital broadcasts coexist. The spectrum situation varies from one European region to another. In areas with an over-crowded spectrum space simulcasting is more challenging and there is greater pressure for a quick switch-off.

Spectrum management has traditionally been closely controlled by national governments. In addition, a high degree of international co-ordination of spectrum management takes place within the ITU/ CEPT.[40] These international for a focus on two major issues: avoidance of cross-border interference, and promoting the circulation of wireless communications services and equipment on a global and/or regional scale by fostering the voluntary harmonisation of the frequency bands used for specific purposes. Though the EU has until recently only intervened in radio-spectrum issues via specific legislation to support EU policies[41], the scope for co-ordination in this area has now been reinforced by the adoption of the Spectrum Decision[42], which enables the Commission to take technical implementation measures to satisfy the harmonised spectrum requirements of Community policies.

3.1. Allocation

In spectrum management it is convenient to distinguish "allocation" and "assignment" issues. Allocation refers to the types of services delivered over specific spectrum bands (terrestrial mobile, fixed satellite, radio astronomy or other), on which harmonisation decisions are largely agreed at supra-national level. The distinction between different services may be nevertheless increasingly challenged by market and technological developments, notably associated with digital convergence, calling for more flexible approaches to spectrum allocation. This issue affects, but actually goes well beyond, the switchover debate. Spectrum assignment refers to granting of rights to use specific frequencies to companies, organisations or individuals, and has been undertaken nationally with little or no consideration of the impact it may have on other countries.[43]

A major allocation issue for all Member Sates is how to reallocate the 'digital dividend'; that is, the spectrum released when analogue broadcasting is finally closed down. Various alternative uses can be envisaged: more and improved TV and radio services (portable reception, improved audio-visual quality including wide-screen and high-definition television, additional programming and services); other wireless services; convergent services; or a mixture of the previous options. So far, the momentum is towards keeping the spectrum within broadcasting, though the potential alternative use of the spectrum by other services is being developed in various fora. Given the rapidity of technological development, and the medium-term prospect of switch-off, it is important not to foreclose any options at this stage. This includes scenarios where

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39 This is spectrum which is suited to many applications and therefore most in demand.

40 'ITU' and 'CEPT' respectively stand for 'International Telecommunications Union' and 'Conférence Européenne de Postes et Télécommunications'.

41 Directives on GSM, DECT and ERMES, Decisions on UMTS and S-PCS.

42 Decision N° 676/2002/EC, OJ L 108, 24.4.2002, p.1.

43 As exemplified by the auctions and other assignment mechanisms for 3G mobile telephony in Europe.

broadcasting would evolve towards more sophisticated or 'convergent' services, for instance 'datacasting' services combining features of mobile telephony and terrestrial broadcasting.

Another issue is the actual organisation of switchover and the timing of switch-off. This is an important factor in determining the spectrum that may be available for other uses, as continued provision of analogue services in one country could constrain the use of the concerned frequency bands in another. This tension between the priorities of different national governments is particularly acute for broadcasting signals because of the long distances they typically travel, due to their high power and their use of low transmitting frequencies (VHF and UHF bands). So switchover progress in some countries, and all its attendant benefits, may be held up by slower migration in neighbour countries.

Technical discussions on co-ordination issues have been taking place for some years in the ITU and CEPT. In particular, a two-session ITU Regional Radio Conference, covering the whole European Broadcasting Area, Africa and contiguous countries, will take place in 2004 and 2006 to review the current frequency co-ordination planning for terrestrial broadcasting (the '1961 Stockholm plan' and subsequent updates), so as to facilitate the digital transition and prepare the post-switch off scenario. These inter-governmental negotiations have a technical focus and decisions are not necessarily based on shared policy goals, with outcomes which may not be in line with market developments. The selection of co-ordination mechanisms according to specific technical criteria may also lead to the exclusion of other alternatives, possibly reducing market competition and consumers' welfare.

In this context, it seems justified to develop EU policy orientations on spectrum management and switchover to achieve the goals of the internal market, addressing in particular the three aspects mentioned: new allocation and assignment mechanisms; organisation and time scales of the migration; amount and future uses of spectrum potentially released at switch-off. This would help clarify the real stakes of the switchover, in particular who will benefit from it, when and how. That would provide certainty for all those involved, help establish their respective responsibilities and avoid misunderstandings.

A framework for this debate has been established by the recent adoption of the 'Decision on radio-spectrum policy' and the 'Decision creating a Radio-spectrum Policy Group'.[44] One of the possible issues to be discussed in this Group is the Community spectrum policy dimension of broadcasting digitisation. In addition, the Commission intends to accompany more closely the European preparations for the 2004 ITU Regional Radio Conference, as it already does for similar events, notably the World Radio Communication Conference[45]. These events should not be exclusively technical but guided by political considerations related to the achievement of Community policy goals, in particular the internal market for equipment and services.

3.2. Assignment

Digital convergence calls for flexible management of network capacity for communication services, including spectrum capacity, and horizontal regulatory treatment. At the same time, current approaches to spectrum assignment may lack efficiency and flexibility to cope with

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[44] Decision 676/2002/EC on a regulatory framework for radio spectrum policy in the European Community, OJ L 108, 24.4.2002, p. 1. Decision establishing a Radio Spectrum Policy Group, OJ L 198, 27.7.2002, p. 49. http://europa.eu.int/information_society/topics/telecoms/radiospec/radio/legislation/index_en.htm

[45] See for instance the Commission Communication to the European Parliament and Council on WRC-03, COM(2003)183, April 14th, 2003. http://europa.eu.int/information_society/topics/telecoms/radiospec/doc/pdf/wrc_03_documents/wrc_03_en_final.pdf

technology and market evolution. Moreover, the fragmented approach to spectrum licensing conditions in the EU Member States may constitute an obstacle to an internal market for wireless communications. In this context, an *eEurope2005* action on 'spectrum policy' indicates that *'the Commission will initiate a discussion on new approaches to spectrum valuation and trading of rights-of-use of frequencies'*.[46]

As for terrestrial broadcasting, the introduction of market mechanisms for spectrum assignment is not easy and there are few relevant experiences. Terrestrial broadcasters argue that the service obligations (universal coverage, service plurality, restrictions on harmful content, etc) limit their control over the spectrum they consume;[47] and that switchover already introduces in the short term additional expense associated with the need to change consumer receivers and simulcast analogue and digital offers during a period of uncertain duration.

This said, discussions on more efficient spectrum use in relation to the digitisation of terrestrial broadcasting are taking place in some countries.[48] This is also is in line with horizontal approaches to communications' networks regulation in response to convergence. The Radio Spectrum Policy Group may consider this topic in a Community context, taking into consideration the linkage between allocation and assignment, trans-border impacts and implications for digital switchover in Europe. In particular, this Group could debate whether the benefits from terrestrial broadcasting digitisation would increase through the introduction of market-oriented tools revealing the value of spectrum. This includes techniques linking spectrum prices and opportunity costs, such as administrative pricing, auctions and secondary trading. Moreover, technological developments[49] will increasingly allow for more efficient and flexible spectrum assignment methods.

Recourse to market mechanisms should be fully compatible with broadcasting policy objectives, which should be supported through appropriate network capacity, and spectrum valuation can be considered in this context. **Spectrum valuation is not synonymous with payment.** Payment could be totally or partially substitutable by service obligations. That would require quantifying their financial impact.[50] Indeed, broadcasters could be compensated for their specific service obligations when competing for spectrum. This would put them on an equal footing with other spectrum users, while making them reveal their valuation of the resource.

It is also important to stress the different nature of network and content authorisations, each of which have distinct policy objectives. Whereas efficiency considerations should be related to rights of spectrum capacity usage, content-related goals would be attached to authorisations for provision of broadcasting services. This separation is established by the new regulatory framework, in particular, the new 'Authorisation Directive'.[51] On the network capacity side, **the**

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46 Op. cit., p. 17.

47 Although the rationale for these obligations could be challenged to the extent that similar content will be increasingly available on other networks, including the internet, calling for more horizontal approaches to content regulation and network complementarity to achieve universal coverage.

48 *BIPE*, ibid., p. 194, reports that in the UK there is a tax on spectrum use modulated according to the penetration of digital broadcasting in a given area.

49 In areas like software radio techniques, 'frequency agile' reception devices or compression algorithms.

50 See study on 'general interest objectives linked to broadcasting', by *Eurostrategies*, at http://europa.eu.int/information_society/topics/telecoms/regulatory/digital_broadcasting/index_en.htm

51 Directive 2002/20/EC on the authorisation of electronic communications networks and services. OJ L 108, 24.4.2002, p. 21. http://europa.eu.int/information_society/topics/telecoms/regulatory/new_rf/documents/l_10820020424en00210032.pdf

top-level objective is to encourage efficient spectrum usage by introducing transparency about the opportunity cost of alternative spectrum uses.[52]

[52] In this connection, the Commission has recently started an independent study on 'spectrum management in the field of broadcasting', whose results are expected for early 2004. http://europa.eu.int/information_society/topics/telecoms/regulatory/digital_broadcasting/index_en.htm

CONCLUSIONS

Switchover from analogue to digital broadcasting is a complex process with far-reaching implications. Experiences will widely differ from one national context to the other, given the different starting positions of Member States. The EU will monitor national switchover policies, while ensuring their compatibility with Community law, and continue supporting digital broadcasting developments.

Policy intervention can facilitate the switchover process under certain circumstances, contributing to achieve general interest goals. **National authorities have a major role to play** in this connection, and the present Communication offers some guidance to them. This consists of general recommendations inspired by Community law and policy, and by external studies undertaken for the Commission. Recommendations include the need for a market and consumer-driven approach, policy transparency and non-discrimination between operators. Proportionality and technological neutrality should characterise public policy measures at national level.

There is also an internal market dimension to switchover and the Union can facilitate this dimension. Several **follow-up actions are identified at EU level**, in particular concerning:

Transparency and monitoring: Member States will provide information relevant to switchover in the framework of the Action Plan *eEurope* and the annual report on the implementation of the electronic communications regulatory package. The Commission will analyse this information and report back to the institutions to which this Communication is addressed.

Consumer information on digital equipment and switchover: the Commission will explore with relevant stakeholders the possibility of co-ordinated action in this area.

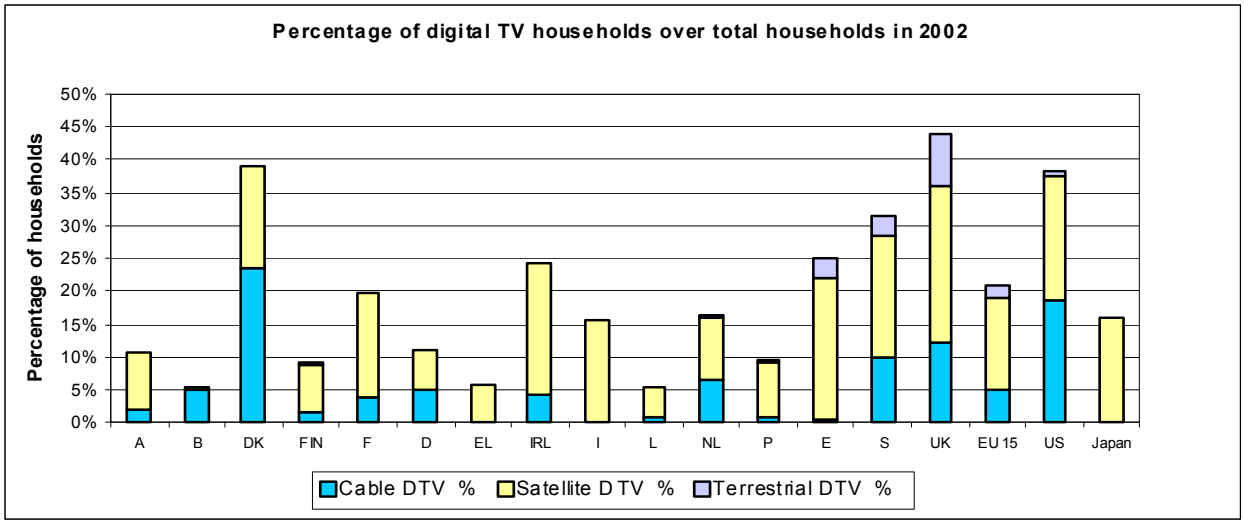
Spectrum: the Commission will propose to Member States to discuss the spectrum aspects of switchover within the new Community spectrum policy framework.

The present Communication is the first comprehensive attempt to assess the issues invoked by switchover. The Commission will continue to monitor the evolution of digital broadcasting markets and national policies. It will revisit as appropriate various issues relevant to the switchover process, in order to facilitate the efforts of Member States and market players, and to ensure compatibility of national measures with Community law and policy.

ANNEX 1 – DIGITAL TV MARKET IN THE EU (estimates for 2002)

(in millions and in percentage of national households)

	Total HH	Total Digital TV HH		Cable DTV		Satellite DTV		Terrestrial DTV	
		TV HH	%	TV HH	%	TV HH	%	TV HH	%
Austria	3.3	0.36	10.7%	0.07	2.1%	0.29	8.7%	0.00	0.0%
Belgium	4.3	0.23	5.2%	0.22	5.0%	0.01	0.2%	0.00	0.0%
Denmark	2.4	0.92	38.9%	0.55	23.6%	0.36	15.3%	0.00	0.0%
Finland	2.3	0.22	9.4%	0.04	1.6%	0.17	7.3%	0.01	0.5%
France	25.1	4.97	19.8%	0.95	3.8%	4.02	16.0%	0.01	0.0%
Germany	37.9	4.14	10.9%	1.94	5.1%	2.21	5.8%	0.00	0.0%
Greece	3.6	0.22	6.0%	0.00	0.0%	0.22	6.0%	0.00	0.0%
Ireland	1.3	0.32	24.4%	0.06	4.4%	0.26	20.0%	0.00	0.0%
Italy	20.1	3.13	15.6%	0.02	0.1%	3.11	15.4%	0.00	0.0%
Luxembourg	0.2	0.01	5.3%	0.00	1.0%	0.01	4.2%	0.00	0.0%
Netherlands	7.1	1.16	16.5%	0.45	6.4%	0.69	9.8%	0.02	0.3%
Portugal	3.6	0.34	9.6%	0.04	1.1%	0.29	8.0%	0.02	0.5%
Spain	12.8	3.21	25.1%	0.05	0.4%	2.78	21.8%	0.38	3.0%
Sweden	4.6	1.44	31.6%	0.46	10.0%	0.84	18.4%	0.15	3.2%
UK	26.3	11.51	43.8%	3.23	12.3%	6.22	23.7%	2.06	7.8%
TOTAL EU	**154.73**	**32.2**	**20.8%**	**8.1**	**5.2%**	**21.5**	**13.9%**	**2.6**	**1.7%**
US	118	44.95	38.1%	21.8	18.5%	22.55	19.1%	0.6	0.5%
Japan	41.9	6.7	16.0%	0	0.0%	6.7	16.0%	0	0.0%



Source: *Eighth Report on the Implementation of the Telecommunications Regulatory Package* [COM(2002) 695 final], annex 2 ('regulatory data'), section 11 ('digital television') available at http://europa.eu.int/information_society/topics/telecoms/implementation/annual_report/8threport/index_en.htm and *Strategy Analytics, "Interactive Digital TV market forecast data"*, October 2002.

ANNEX 2 – CHECKLIST OF ITEMS THAT COULD BE INCLUDED IN MEMBER STATE PUBLISHED SWITCHOVER PLANS[53]

1. Strategic plan for switchover, approved or in preparation, if any; Relevant regulation.

2. Policy objectives for digital broadcasting: social, cultural, political, economic, etc.

3. Spectrum management policy choices and scenarios, before and after switch-off: services, coverage, assignees, conditions of use, spectrum allocation intentions, objectives for 2004 Radio Regional Conference negotiations.

4. Implementation choices to best fulfil policy objectives, trade-offs, justification: types of networks, modalities of service, role of authorities, main players, licensing, etc.

5. Tentative calendar for achieving objectives, including target dates for switch-off, and status.

6. Stakeholders' involvement in switchover strategy design and implementation: mechanisms for consulting and processing feedback, players involved, commitments.

7. Criteria for achievement of policy objectives, mechanism/ indicators for monitoring and retro-feeding into or reviewing strategy.

8. Market assessment (e.g. cost/ benefits analysis) justifying certain modalities of public intervention (rather than others) in and beyond areas of exclusive public competence.

9. Policy obligations and incentives (political, informational, regulatory, financial, other); Implementation modalities; Targeted value-chain segments (transmission, content, reception, consumption, other).

10. Areas for possible EU co-ordinated action, now or in future; Justification with regard to market status and prospects, legal responsibilities, other.

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53 e*Europe 2005* requires Member States to report on TV switchover (see below). However, they are encouraged to provide the information listed in this annex also for digital radio.
***Digital switchover**. In order to speed up the transition to digital television, Member States should create transparency as far as the conditions for the envisaged switchover are concerned. Member States should publish by end 2003 their intentions regarding a possible switchover. These could include a road map, and an assessment of market conditions, and possibly a date for the closure of analogue terrestrial television broadcasting which would enable the recovery and refarming of frequencies. National switchover plans should also be an opportunity to demonstrate a platform-neutral approach to digital television, taking into account competing delivery mechanisms (primarily satellite, cable and terrestrial).*
COM(2002) 263 final, eEurope 2005: An information society for all**.**
http://europa.eu.int/information_society/eeurope/news_library/documents/eeurope2005/eeurope2005_en.pdf