



**A FUNDAMENTAL REVIEW OF THE POLICY OF
EUROPEAN TECHNICAL REGULATIONS APPLIED TO
THE EMERGING DIGITAL BROADCASTING
TECHNOLOGY**

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INTRODUCTION

Europe has been trying to regulate emerging broadcasting transmission technology since the mid 80's. A third draft Directive in eight years has been tabled in December 1993 by the Commission to the Council of Ministers and the European Parliament that aims to amend the second MAC Directive. This coincides with the world facing a major technology break point with the introduction of all digital video broadcasting technology. The Steering Board of the Digital Video Broadcasting Project set up an Ad Hoc Group to review the question of regulation in the digital era. A mixed group of broadcasters, network operators, manufacturers, Government officials and a Commission representatives have carried out a policy review study. It has stood back from the arguments of the past few years and tried to identify the basic principles that should govern European policy in the field of technical regulation for digital video broadcasting. This is their report. The report was examined by the Steering Board at their meeting on the 1st March and approved for public dissemination in order to contribute to the wider debate on the future of European technical regulation in the digital video broadcasting era.

Steering Board
1st March 1994

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1. *BACKGROUND*

- 1.1 European broadcasting markets have a long history of regulated standards. The transmission standards, PAL and SECAM, were set by Governments in consultation with their public service broadcasters and industry. They have provided a national framework within which there has grown national competition between broadcasters and international competition in the supply of equipment. The advent of satellite broadcasting has moved broadcasting beyond national frontiers. Cable television and microwave video distribution systems have considerably extended the number of channels available to viewers. However these developments are not uniform across all EC Member States and significant diversity in the development of broadcasting infrastructures exists.
- 1.2 The arrival of a new technology offers Europe a window of opportunity to consider moving onto a convergent path. But the market is becoming far more competitive. Processes are speeding up. The character of the market is changing with the convergence of technologies and the emergence of many new players.
- 1.3 The recent European experience with regulation of high technology standards has had an uncertain outcome. With GSM digital cellular radio it has proved to be highly successful, with wide adoption in Europe and a great exporting success. With high definition MAC technology the measures have not succeeded for a variety of reasons, even though there was considerable support for the first MAC Directive in 1986.
- 1.4 One has to be cautious in making comparisons between the two cases since there were different circumstances in each that affected the outcome. Nevertheless, the two Directives are very similar in their construction in that both set out to regulate the precise standard that may be used on specific frequency channels on a new technology. Thus whilst one should

not take a comparison of GSM and MAC too far, an examination of the European approach to regulation in the two cases offers European policy makers some valuable lessons.

- 1.5 It is evident that circumstances surrounding the GSM directive had the following attributes:
 - 1.5.1 The system being standardised addressed tangible market requirements eg pan European roaming, lower base station infrastructure cost, encryption service, second operator opportunities etc.
 - 1.5.2 The GSM process was being driven forward by a significant number of the commercial service level operating companies with the support of the large manufacturers.
 - 1.5.3 The directive came behind an initiative that was already moving as a result of commercial motivation (but before any serious investments had been made) and had the effect of holding it together and extending it.
 - 1.5.4 The timing was right. Had the initiative come 12 months later it is unlikely to have held together and 12 months earlier there was no consensus as to technology direction.

On the other hand the MAC process either did not have the above attributes or lacked them to the same measure. In fact the second MAC Directive, in its latter stage, found itself trying to change the direction of service operators and the public who had already made significant investments.

- 1.6 These variable results and the fundamental changes in the broadcasting market suggest that traditional approaches to regulating broadcasting standards need careful review.

2. THE ROLE OF REGULATION IN BROADCASTING IN A DIGITAL ERA

- 2.1 In order for a policy review to be comprehensive it is useful to begin by looking at all the reasons why Governments have historically intervened in broadcasting regulation. For each it is important to see the extent to which digital video broadcasting creates new valid reasons for regulatory intervention bearing in mind the lessons of recent experience.

- 2.1.1 Industrial policy - European governments have in the past acted to protect or advance national manufacturing champions. A strong and competitive European manufacturing base remains a valid objective. But considerable more caution is needed in the use of regulation as an instrument to this end and particularly where this becomes in conflict with the interests of other legitimate interests in the market, such as the consumers and broadcasters.
- 2.1.2 Frequency scarcity - Here Governments have a legitimate role in ensuring the most appropriate access to a scarce natural resource. This remains the case particularly for terrestrial digital broadcasting. The digital technology, with its considerably more efficient use of the frequency spectrum, could in the long term, generate an abundance of capacity. This could reduce the need for Government intervention in allocating scarce spectrum resource. However, history offers us a note of caution. In the passage of time when this extra capacity is coming on stream, so could new applications demanding extra spectrum.
- 2.1.3 Political reasons (protecting freedom of speech, taste and decency etc) - These are legitimate interests of Governments but there is no reason to think that the digital video broadcasting technology raises any special or new issues in these regards.
- 2.1.4 Cultural identity - Concerns have been expressed that the many extra channels that the digital technology may generate could be filled with programmes that erode cultural identities. Even if the fears are right, the use of technical standards to erect barriers against such a trend is doomed to failure. Broadcasting by satellite is intrinsically international. To make the technology affordable to European consumers will require economies of scale through maximising the use of international standards. However, linguistic diversity, as a precious part of European culture, could be assisted if the technical standards for the digital technology allowed for multiple language sound channels.
- 2.1.5 European network infrastructure - Governments have a legitimate interest in fostering the development of communications infrastructures. This is given expression in the Union Treaty in the provision on Trans European Networks. However the political question to be addressed is whether digital video broadcasting is an important future European infrastructure or simply a trend in the consumer electronics market, such as computer games machines. It is also a matter for debate as to whether solutions are better found through the voluntary European standardisation processes. These questions are discussed in more depth later.
- 2.1.6 Competition policy - Governments have viewed technical standards at different times both as a legitimate area of competitive market differentiation and as barriers to competition. In general common technical standards do act to maximise a competitive service market since consumers can more readily switch between service providers.

- 2.1.7 Consumer protection - Much has already been made of the need to protect consumers from the need to stack many black boxes on top of their TV sets in order to receive all the service offerings in the digital era. A slightly contradictory argument has been put that consumers will simply not be willing to buy a second box, thus giving disproportionate market power to the first mover. Clearly an environment that leads to many competitive service offerings through one or few black boxes has many advantages for consumers. On the other hand, regulation should not prevent a person's freedom to purchase more than one box should this be desired, for example to receive broadcasts from a second satellite orbit position.

3. THE DILEMMA FACING EUROPE - IS REGULATION NEEDED ?

- 3.1 Europe is facing contradictory pressures. On the one hand the new digital broadcasting technology is very immature and the markets hardly explored. The huge permutations of possibilities from the new digital technology makes it far from clear what the optimal path is. EC legislation takes a long time to adopt and no less time to be revoked. This process is not well matched to rapidly changing technology and markets. All this doesn't provide a sound basis for the early regulation of standards.
- 3.2 There are also fundamental questions about the appropriateness of regulating digital services, or at least particular applications of digital. For instance, it could be argued that many satellite broadcast services do not feature the characteristics which justified regulation of the state-led terrestrial television and telecommunications networks - eg they do not use such scarce frequencies; their penetration is relatively small; they are invited into the home by paying customers rather than granted automatic universal access; they are privately owned and do not benefit from state funding or subsidies; and they are just one of a number of systems which will be used for digital television distribution. It may be as inappropriate to impose new regulations for such services as it would be to do so for print publishing technology or consumer electronics products such as video games, whereby private commercial enterprises are free to introduce new (and possibly incompatible) products and services - even if policy makers could determine "optimal" technology.
- 3.3 On the other hand is the concern for the future of European communications infrastructures. The power of a network is its reach to the largest possible number of connected parties. Fragmented standards dissipate this power. Since Europe finds itself in competition with other parts of the world, having less powerful communications networks can potentially be a source of competitive disadvantage for Europe. Without compatible technical standards for networks, a wide variety of incompatible solutions could take hold in the market, thus creating barriers to

communications. Once investments are sunk in a solution that works tolerably, few commercial entities can justify money to align network standards very rapidly, if ever. What has happened with the European ISDN confirms how these barriers can impede Europe wide services. AM stereo in the USA is another example where lack of a single standard led to nothing really useful to consumers in general being achieved. The USA situation with digital mobile radio is another example of the competitive disadvantage that can come through neglect of coming to grips with the standards issue in a timely way. In their case they failed to act decisively in the mid to the late 80s. This is one reason why Europe has been so highly successful in exporting GSM digital cellular technology.

- 3.4 This is the dilemma facing Europe then. If Europe rushes ahead to regulate for a single standard for digital video broadcasting there is a real chance of getting it wrong. The error could be so high as to damage European's digital broadcasting future. Innovation may be stifled. However, if Europe fails to come to grips with the standardisation issue then it can find itself with relatively weak fragmented networks and at a competitive disadvantage with other parts of the world. Without doubt, digital technology in some form has the potential to be Europe's major distributive electronics highways for the 21st century.

4. THE VOLUNTARY APPROACH TO STANDARDS

- 4.1 Europe has a more refined set of choices than either rushing immediately to legislate for a single standard or standing back and allowing a *laissez faire* free for all for the remainder of the decade.
- 4.2 It is first useful to see what can be accomplished in the purely voluntary domain. Europe has a number of levers to pull within the standardisation process itself. It can resource the European standards bodies with standardisation mandates so as to act with speed in producing standards. It can use the Commission mandate process to ensure the European standards body respond in a timely way to the perceived needs of all parts of the market with a family of standards. Finally it can monitor the results of the European standards body to ensure it has got a technically/economically effective solution that is supported by all parts of the market. All parts of the market here is intended to mean that broadcasters and manufacturers have both signalled their support through commitments to invest on a commercial risk taking basis.
- 4.3 It is worth bringing in at this stage the role of the Memorandum of Understanding for the Digital Video Broadcasting Project. Digital video broadcasting technology will put an enormous strain on the standards making capacity of Europe. This is not just a question of work load. This new technology straddles the broadcasting, telecommunications and

computer markets and industries and is therefore hitting the fault lines of the demarcation of responsibilities of the existing European standards making bodies. Computer standards in general fall to CEN but they have, in general, left the field to the International Standards Organisation.

Indeed this is where the work on digital source coding for digital video broadcasting is going on. Consumer electronics has been the domain of CENELEC and they have a good track record of activity for brown goods. Broadcasting systems standards have tended to be a matter for the European Broadcasting Union. This brings together the expertise of the European public broadcasters but not the private broadcasters. ETSI has complete coverage of the telecommunications field and allows membership of private broadcasters. It has entered into a cooperation agreement with the EBU for new broadcasting technologies. In turn ETSI has an agreement with CENELEC that recognises ETSI/EBU as dealing with systems and CENELEC with the subsequent receiving equipment. Thus the fabric is there but is very complicated and largely untested under pressure. It is here that the Memorandum of Understanding for Digital Video Broadcasting, now signed by 80 entities, offers a significant added value in managing this process. The already close working relationship between the Commission and the MOU will help to keep the standards bodies on track.

- 4.4 Creating the right standards at the right time is a necessary but not a sufficient condition to create a successful European market in digital video broadcasting. The crucial ingredient for success in a consumer market is to rapidly get down the unit cost of the receiving equipment. This requires high production volumes. To achieve this two sets of players have to move concurrently. The first are the broadcasters to launch attractive services in the new technology. The second are the manufacturers to put onto the market attractively priced consumer equipment. This has to happen across a large enough number of countries to secure the necessary volumes. The commercial Memorandum of Understanding of the type used for the GSM digital cellular radio services offers a model for achieving this. The success of this model comes if enough purchasing power is represented by committed signatories to pull the standard through and make it stick in the market.

5. A REGULATED APPROACH TO STANDARDS

- 5.1 So far the options considered have all been in the voluntary domain. There is a good argument for saying that if the market can achieve for itself the desirable goal of harmonised digital video broadcasting networks - then there is no need for regulation. But it has to be said that if it is discovered that the market cannot agree on a voluntary harmonised standard, there may well be extensive sunk investments. At this stage regulation would be very painful and expensive.

- 5.2 If the political levels believe a public interest argument exists for some form of regulatory standards framework for digital video broadcasting then all options should be carefully examined. The first thing needing careful consideration is the scope. Should such regulations apply to the digital video technology only and not the associated conditional access system (or vice versa or to both)? Should regulations apply to all digital video transmissions or just those intended for reception by the general public? Can systems be distinguished in practice on this basis? Should regulated standards apply to satellite and terrestrial systems only or cable, satellite and terrestrial systems?
- 5.3 There are also a range of options in the form of the regulation. The most deterministic form is a directive that has embodied within it a technical specification or refers to a single specified version of a technical standard. A family of standards could cover different transmission media and perhaps different market applications. The problem with this approach is the high demand on the clairvoyant powers of those drafting the regulation or standard to get the solution right first time in every detail.
- 5.4 A second distinctive approach is for a directive to require all systems to conform to a European standard. This has the merit of leaving it to the commercial undertakings to determine the form of the standards following the fair and open rules of European standards making. But it still places an enormous responsibility on the standards bodies to get it right and be fast enough to adapt the standard if it hasn't. It can be said in their favour that the standards bodies can in theory act faster in terms of corrective action than the European legislative process. But this has yet to be demonstrated in practice.
- 5.5 A variant of this option is for a directive to allow only systems defined by a European standards body but require the standards body to respond with a plurality of standards according to the needs of service providers. This may seem a strange option in harmonisation terms but this approach may be considered particularly appropriate for conditional access systems where fair and open competition rather than harmonisation may be the main concern. This is discussed more fully later.
- 5.6 A fourth option is for the political level to limit itself to a statement that, while it would not issue retrospective legislation affecting voluntary harmonised standards, it reserved its right to have regulation at some time in the future, should certain defined circumstances arise (or not arise). This is the weakest option short of declaring an intention of leaving the process entirely to market forces. One problem with this option is that it may create uncertainty in the market.
- 5.7 Next one must consider the flexibility of regulation in a market driven situation. One objective of a directive is to help create stability to allow European wide infrastructures to be developed. But consideration needs to be given on how to adjust directives to meet rapid unexpected changes in

the market or technology. It can be seen over the past five years that much can happen in broadcasting technology. And the processes, if anything, are speeding up. The tendency in directives is to try to meet this need by giving the Commission a requirement to review market developments. But there is the human difficulty of how quickly those who made the original proposal can accept (or are allowed to accept) the fact that the market has overtaken events. One possible way forward is short life directives with no presumption of renewal.

- 5.8 Where a directive delegates technical matters to a standards body, there should be a procedure to deal with problems faced by the standards body. An example of this may be where the standards body hits an Intellectual Property Rights issue that may not be sufficiently serious to cause it to annul the standard but may raise competition or GATT issues for the European Union.

6. THE PARTICULAR CASE OF CONDITIONAL ACCESS

- 6.1 It is useful to make a distinction between standards for clear transmission of digital broadcasting and standards for encrypted transmission associated with conditional access or pay TV type services. Certainly the market perceives there to be a difference. There seems to be general support for a serious attempt to make a common standard for clear digital broadcasting transmission. A common scrambling standard may also be possible. But there are strongly held divergent views on whether conditional access systems should be standardised or not. This is inhibiting action within the standardisation bodies. Thus a statement from the political levels is essential to clarify the situation. There are valid arguments in both directions.
- 6.2 Where the service provider buys the consumer boxes and installs them in subscriber homes there is a question to be addressed on the rights, terms and conditions of access by parties who have not made any such risk investments. Privately owned conditional access systems give the service provider more control over security aspects. It may also be argued that normal competition laws can deal with any abuses of dominant situations.
- 6.3 On the other hand there is a view amongst some service providers that undue competitive advantage is accrued by the first mover and this will inhibit the development of a digital broadcasting competitive market. Consumers may be unwilling to stack many conditional access boxes on top of their TV set to receive programmes from a number of service providers. The time delays of the alternative of going to court to gain access to the infrastructure of the dominant service provider may lose key windows of market opportunity. A proprietary system can be designed to be technically inconvenient for supporting more than one service provider. Some national authorities may see a pre-emption by proprietary systems as raising the

threshold of difficulty for public broadcasters who may wish to move across to some percentage of subscription type funding. This may lead to divergent national technical regulations in the absence of European ones.

- 6.4 A single harmonised conditional access system is technically feasible but raises a number of important security, commercial and economic issues that are beyond the scope of this paper to address. Where access by manufacturers to the key conditional access interface specifications may be the main concern rather than harmonisation as such, consideration may be given to the standards bodies producing a plurality of standards. Something in advance of a plurality of standards but short of a fully harmonised approach may be achievable without the need for regulation, for example a common scrambling system. The dominant service provider problem could then be separately addressed by a voluntary code of conduct on access by other service providers.
- 6.5 A fuller analysis of the conditional access issue will be available in the report of Conditional Access Ad Hoc Group.

7. A TECHNOLOGICAL/MARKET VISION FOR EUROPE

- 7.1 It is not easy to see how decisions can be made on regulation in the absence of any sort of general vision of what Europe is setting out to achieve.
- 7.2 Visions can be a top down process where political objectives are set and attempts are made to stimulate subsequent commercial actions to implement the vision. The opposite is a bottom up process. Here actions arise in the market from commercial initiatives and subsequently a political vision is created out of them. An intermediate solution is for the political vision to be set in only the most general terms. Then bottom up commercial initiatives are given political recognition where they accord to this general blue print. Some small adjustments may be required in both directions to achieve a fit.

8. CONCLUSIONS

The following recommendations flow from the above analysis:

- (A) A point of considerable importance to be stressed is that the political level has to say clearly at the outset what the regulatory rules of the game are going to be for digital video broadcasting. If there are to be regulated standards for digital video broadcasting and/or any associated conditional access systems, this needs to be declared at the outset. The market will

react accordingly and nobody who invests will have been misled. If there are only to be voluntary standards then a number of approaches in the market are likely to occur. But the worst situation for Europe would be to say that there will be voluntary standards, not like the tendencies and then come in three to five years and seek to try to impose technical regulations. This will damage investment confidence and may not even work.

- (B) Before attempting to decide on regulation, it is essential to understand exactly what sort of market digital video broadcasting is likely to be. If it is likely to be a fast changing consumer market (computer games would be a good analogy), then the need for any sort of regulation needs to be questioned. If at issue is Europe's long term electronic distributive infrastructure market, then the case for regulation does warrant examination. The new digital video broadcasting technology may well have features of both sorts of market and careful study will be needed to clarify the boundary.
- (C) Such clarity would be enhanced if Europe had a vision of its future digital video broadcasting infrastructure in some form of non prescriptive blue print.
- (D) The European Union should set the time and shape of any regulation to come behind a credible market led initiative that:
 - (i) addresses tangible market requirements of service providers and consumers (ie not technology led);
 - (ii) is driven forward by a significant number of service level companies (broadcasters and network operators), supported by the large manufacturers;
 - (iii) is already moving but before serious investments have been made;
 - (iv) with the intended effect of holding it together and extending it.