

## HDTV on digital terrestrial transmitters?

The ITU Regional Radiocommunication Conference held in Geneva in May-June 2006 produced a new Plan for digital terrestrial broadcasting using Bands III, IV and V in Europe, Africa and parts of the Middle East. Administrations are now turning their minds to implementation of this Plan. A key element in their deliberations is how to use the “[digital dividend](#)” which is the spectrum that becomes available when the analogue TV services are closed down. In principle, the digital dividend could be used for many types of service – but the main contenders are mobile TV and HDTV services.

Operators of mobile phone networks are understandably excited by the prospect of access to spectrum in Bands IV and V that could be used for broadcasting of TV services to hand-held devices, such as mobile phones. Many mobile-phone operators are currently building 3G networks that can deliver a limited number of video services, but the “one-to-one” nature of 3G systems means that they cannot satisfy many simultaneous demands for video services (e.g. during peak periods, such as major football matches).

One obvious solution is to modify the 3G systems to include a “one-to-many” mode (such as MBMS) that allows the same signal to be viewed simultaneously on many terminals. Although the need for such techniques in 3G systems was first recognised about 10 years ago, the mobile-phone operators do not have enough 3G spectrum to meet the likely requirements. Fortunately for them, the DVB-H standard was specifically designed to deliver multiple video services using spectrum in Bands IV and V – whilst having a spectrum mask similar to that of normal DVB-T services. In essence, the mobile-phone operators have suddenly discovered the benefits of “one-to-many” services – which is known as “broadcasting” by most readers of EBU Technical Review! An added benefit is that propagation is much better in Bands IV and V than in the 3G bands near 2 GHz, thus dramatically reducing the costs of the transmitter networks. Taking all these factors into account, it is not surprising that the mobile operators are interested in the digital dividend.

On the other hand, the digital dividend could be used for HDTV services. However, as HDTV screens are large and not easily moved, HDTV can be delivered in any frequency band (even by satellite at frequencies around 12 GHz) or via cable systems. Hence, it could be argued that HDTV transmissions should not occupy spectrum that would be better used to deliver services (e.g. those aimed at handheld devices).

The fundamental question is “Should terrestrial transmitters be used to broadcast HDTV services?” To the advocates of mobile TV, the answer is very obviously “no”.

The Flat Earth Society was established in England about 150 years ago with the aim of proving that “the earth is flat”. At that time, most people had difficulty in accepting the arguments of scientists and philosophers – but, nowadays, very few people would seriously argue that the earth is flat because of the overwhelming evidence against this idea. Are those favouring HDTV similar to members of the Flat Earth Society?

Within Europe, HDTV on digital terrestrial transmitters is often dismissed as an unnecessary luxury or as a waste of valuable spectrum. Outside Europe, digital terrestrial transmissions successfully carry HDTV in Japan, the USA, Korea, Australia, etc. Are the laws of physics different in Europe? Are the laws of economics different in Europe?

In many European countries, consumers are already buying “HD-ready” displays BEFORE any HDTV content is available – either in the form of broadcast services or in the form of packaged media. This has never happened with any other technology – nobody bought a colour TV set before broadcasters starting transmitting in colour. Sales figures for “HD-ready” displays show rapid growth – and, with the prices falling by 25% or more per year, it seems certain that HD-ready displays will become the norm very soon. HDTV provides a dramatic improvement in picture quality – and SDTV will not be good enough for an HDTV world (in which consumers will expect HDTV content).

HDTV is inevitable – just like colour TV has now replaced black & white TV. Under such circumstances, broadcasters will face considerable pressure from the public to launch HDTV services.

In the early 1990s, most “experts” claimed that terrestrial TV had no future in the digital world because it was much easier for broadcasters to use satellite or cable delivery (both of which offered greater bandwidth than terrestrial transmission). Despite early problems with the failure of some pay-TV services, digital terrestrial TV is now very successful in many European countries. It is worth noting that, without the success of digital terrestrial TV, there would be NO digital dividend.

There are plans for digital terrestrial HDTV services in France and Norway, but digital terrestrial TV elsewhere in Europe is almost entirely based on multi-channel SDTV. Even if broadcasters adopt new video compression systems, such as MPEG-4 AVC, and wait for the DVB-T2 system (which promises significant increases in spectrum efficiency compared with DVB-T), the digital dividend will only allow terrestrial broadcasters to offer a few HDTV services. When HDTV becomes successful (as it surely will), terrestrial broadcasters may need to close down some of the existing SDTV services to make way for HDTV services – but such decisions will not be easy.

A long-term plan for migration to HDTV is needed, especially as the transition from analogue TV to digital TV is still not complete. Unfortunately, consumers expect their TV sets to last “for ever” – and it will be impossible to persuade everybody to upgrade to HDTV at the same time.

If terrestrial broadcasters ignore HDTV, consumers will slowly drift away to other platforms that can offer HDTV. Terrestrial broadcasters must start planning NOW for the introduction of HDTV – for example, by actively supporting the development of the DVB-T2 specification.

If regulators prevent terrestrial broadcasters migrating to HDTV, the terrestrial market will inevitably decline. Terrestrial broadcasters cannot ignore HDTV.

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