Europe considers its options for the
digital dividend

By Jonathan Watson

Ever since the advent of digital TV, it has been clear that one day, analogue broadcasting would no longer be needed. But even though that day is now fast approaching, with most European countries planning to switch off their analogue TV signals by 2012, the debate about what to do with the spare frequencies freed up by the move – the so-called “digital dividend” – is far from over.

This debate, although complex, often boils down to a single question: should the available frequencies be used for more, better digital TV, such as high-definition digital terrestrial TV (HD DTT) and mobile TV, or should they be used primarily to improve the availability of mobile and fixed-line broadband Internet access?

The digital dividend

The digital dividend can be defined as the spectrum over and above the frequencies required for existing broadcasting services in a fully digital environment, including current public service obligations.

More TV channels with less spectrum

Digital compression systems already allow the transmission of between six and eight standard digital TV channels in the spectrum previously used by one analogue TV channel, and these efficiency gains are expected to continue increasing in the future.

The UK, for example, is planning to provide 45 TV channels in much less spectrum than previously used for the equivalent of seven national analogue broadcasting channels, and is considering introducing up to 20 extra TV channels in the excess frequencies. The digital dividend is also expected to exceed the spectrum currently available for GSM mobile phone systems in most European countries.

Spectrum of “premium” quality

Not all spectrum bands offer the same physical characteristics: higher frequencies do not carry signals as far, and do not penetrate buildings as easily, and lower frequencies have capacity limitations and create more interference. The spectrum of the digital dividend is particularly attractive because it is part of the “best” spectrum located between 200 MHz and 1GHz, offering a good balance between transmission capacity and distance coverage. Its good signal propagation characteristics also mean that less infrastructure is needed to provide wider coverage. This reduces cost and improves service, particularly in ensuring communications inside buildings and reaching out to remote populations in rural areas.

Fragmentation

However, the spectrum making up the digital dividend is currently highly fragmented into relatively narrow bands, scattered over many frequencies, and intertwined with digital broadcasting channels. This is a result of spectrum planning options adopted at the ITU Regional Radiocommunication Conference, which produced an international plan, the Geneva 2006 agreement, on the basis of traditional broadcasting use. Some flexibility is provided in the Geneva agreement to open up the spectrum to other uses. However, this flexibility is limited under existing technical conditions.

EC action

In recent months, the European Commission has been attempting to encourage EU member states to make faster decisions about how to use the dividend. In a communication published in November, Brussels described the release of frequencies as “a unique opportunity...
Spectrum and spare frequencies

For illustration purposes only, the overall clustering could look as outlined below:

**Common spectrum sub-bands (clusters)**

<table>
<thead>
<tr>
<th>Spectrum used for the continuation of existing TV and radio services</th>
<th>Example of services: wireless broadband access, high speed mobile data access</th>
</tr>
</thead>
<tbody>
<tr>
<td>470 MHz &lt;--------------------------------------- UHF band ------------------ &gt; 872 MHz</td>
<td></td>
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</tbody>
</table>

**Spectrum under exclusive national management**

<table>
<thead>
<tr>
<th>Unidirectional Networks (high power)</th>
<th>Unidirectional networks (low to medium power)</th>
<th>Bi-directional networks (low power)</th>
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</thead>
</table>

Vacant spectrum for use as the national part of the digital dividend

Example of services: mobile TV

Example of services: more TV services, possibly HDTV

Part constituting the actual digital dividend.

To meet the fast growing demand for wireless communications services. It opens up sufficient spectrum for broadcasters to significantly develop and expand their services while at the same time ensuring that other important social and economic uses, such as broadband applications to overcome the ‘digital divide’, have access to this valuable resource.

The communication argued that many potential uses of the dividend would simply not occur if access to spectrum was not better coordinated across the member states. “Overcoming this major hurdle calls for ‘tidying up’ the spectrum of the digital dividend in order to make it more usable and more consistent across borders,” the communication said.

The Commission’s idea for “tidying up” the spectrum is to group the released frequencies into “clusters” which could be used for similar types of services. Keeping the same types of service – mobile broadband, for example, or digital TV – in the same clusters would reduce the chances of interference between the various services. The communication suggests that the more straightforward services such as broadcasting should go in the lower bands; more complex offerings such as mobile TV should go in a higher sub-band; while services that require the highest degree of interactivity, such as mobile and fixed broadband, should go in the higher frequency band. It adds that the broadcasting sub-band could be controlled by member states, the middle one could be harmonised on a voluntary basis, and that the higher band could be subject to “EU harmonisation”.

Reaction to the plan has not been particularly positive, much to the disappointment of the EC information society and media commissioner Viviane Reding. “Faster and more ambitious action on the digital dividend is urgently required if we want to maintain and strengthen the competitiveness of our continent,” she said in her speech to the GSMA Mobile World Congress in February.

**Country-by-country: the UK**

Perhaps the biggest problem for the Commission is that although most EU member states have not made a decision yet on allocating the dividend, many of them have embarked on a lengthy and complex planning process. In the UK, the regulator Ofcom is leading the debate through its digital dividend review (DDR). Its original proposals, published in December 2006, proposed auctioning the 112 MHz of spectrum that would be released at the end of 2008 as tradable, technology and service neutral licences with no restriction on change of use. The 112MHz available consists of 14 channels of 8MHz, which are currently used for analogue TV.
Digital switchover in the UK is happening on a regional basis between now and 2012. The first place to go all-digital was the town of Whitehaven and surrounding borough of Copeland. The process was completed in mid-November 2007 and appears to have gone smoothly: most of those involved in switchover, from Digital UK, the body set up to oversee the process, to the local people and the charities brought in to help, there is consensus that it was a success. The next TV region to switch over is Scottish Borders in November 2008, followed by West Country, Wales and Granada, starting in 2009.

France

In France, discussions about how to use the dividend are also well under way. Unlike the UK, the final decision will be a political one, with ultimate responsibility resting with the Prime Minister. This decision is due to be taken at some point in the next 12 months. The spectrum that will be available has not been identi-
France: options for digital dividend
- Interactive services, in particular subtitling for the deaf and hard of hearing
- New digital TV channels
- Extension of HDTV, either by extending the coverage of the three services soon to be authorised by the regulator, awarding new HDTV licences or by migrating the whole of France’s DTT offering to HD. This third option would use up all of the digital dividend
- Extension of mobile TV, either by extending coverage in the country or by developing a second multiplex to add to the one already put together by the regulator
- Internet for all, using the frequencies to ensure the availability of low-cost high-speed Internet access, either fixed or mobile, throughout France

Source: ‘Dix ans après, la régulation à l’ère numérique’, report by Senator Bruno Retailleau

France: frequencies used for analogue and digital TV

<table>
<thead>
<tr>
<th>Band</th>
<th>Frequencies</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHF: band III</td>
<td>Frequencies between 174 and 222MHz</td>
<td>Canal Plus and Télè Monte Carlo (TMC)</td>
</tr>
<tr>
<td>UHF: bands IV and V</td>
<td>Frequencies between 470 and 614MHz (band IV), 614 and 862MHz (band V)</td>
<td>Five national analogue channels (France 2, France 3, Arte /France 5, M6) and since March 2005, digital terrestrial TV</td>
</tr>
<tr>
<td></td>
<td>Frequencies between 830 and 862MHz</td>
<td>Ministry of Defence</td>
</tr>
</tbody>
</table>

Source: Journal du Net

Germany
Analogue switchoff is well underway in Germany, where regions have been switching ever since Berlin was the first to take the plunge in August 2003. In most places switchover has been quite swift, with analogue and digital broadcasting rarely coexisting for more than nine months. Switchover is due to be completed by 2010, but could happen much earlier, probably this year.

In terms of the digital dividend, the situation is less clear. In early 2006, the regulator BNetzA published a paper describing the opportunities for using the digital dividend frequencies for purposes other than broadcasting: broadband, wireless access and multimedia services. However, the country’s broadcasters were strongly opposed to the proposals, and since then no decisions have been taken.

Sweden and Finland
Further north in Sweden and Finland, things look much simpler. Sweden completed the switchoff of its analogue terrestrial TV platform in October last year, well ahead of the planned date of February 2008. The last cities to switch off analogue services included Malmö, Helsingborg, Hörby, Karlshamn and Karlskrona, in the Skåne region of Sweden, along the southern tip of the country. The task was completed.
when the transmissions from public broadcaster SVT's two public channels and the commercial broadcaster TV4 were finally switched off at 4pm on 15 October 2007, completing a switch off programme which began with Gotland in September 2005.

The Swedish government has also decided what it wants to do with the dividend. It is freeing up the higher bands – 790 to 862MHz – for non-broadcast services, and using the remaining UHF space between 470 and 790MHz to accommodate six broadcasting multiplexes, as opposed to the five now in existence across the whole spectrum, thanks to the efficiencies of digital broadcasting over analogue. Another multiplex is also being created in the VHF band from 174 to 230MHz. The task of planning and organising the reordering and release of the spectrum has been given to the National Posts and Telecom Agency (PTS).

Finland moved into an all-digital world at 4am on 1 September 2007. Switchover had originally been planned for 31 August, but TV channels wanted to show that day’s programming in its entirety before the transmitters were shut down. The vast majority of households that receive broadcasts through an antenna now need a digital receiver, a set-top box, or an integrated digital TV to view them.

As for the digital dividend, part of it is being used to launch a new multiplex (multiplex E – see table) with seven new digital pay TV channels. These include Discovery Channel, Eurosport, Channel Four Finland pay TV, MTV3 Fakta, Music Television MTV, Nickelodeon and SVT Europa. Multiplex E will first be available in the southern and central part of Finland, prior to its extension to other parts of the country.

Decisions about what to do with the rest of the digital dividend, a job for the Ministry of Transport and Communications along with the regulator Ficora, have not yet been taken. Public broadcaster YLE has said in the past that one multiplex should be allocated to mobile TV using the DVB-H standard and three multiplexes should be allocated to HD DTT and standard digital TV.

**Netherlands**

The other places where analogue TV has been turned off are Luxembourg and the Netherlands. In the Netherlands, analogue TV was switched off during the night of 10-11 December 2006, making the Netherlands the first country in the world to complete digital switchover on its terrestrial platform. Within a three-hour period, analogue transmissions were shut off while DTT services were put back on the air. The transmission of services from the national and regional public service broadcasters continued throughout the switchoff process. Given the domination of the Dutch TV market by the cable platform, less than five per cent of the population was affected by analogue switchoff on the terrestrial platform. And probably for the same reason, the government has not yet reallocated the airwaves.

Overall, it is going to be difficult for the European Commission to hurry the DD process.