



# Submission for Commission Hearings on the Digital Dividend

6<sup>th</sup> March 09 - Brussels

## Introductory thoughts

The WRC-07 identified 72 MHz for mobile broadband services (IMT) in some countries of Europe and Africa whereas many countries globally, including the US, there was an identification of 108 MHz. Within the European Union, to date, there has not been an open enough discussion on the best use of the digital dividend across all Member States; we therefore welcome the Commission facilitating such discussion in Brussels on 6<sup>th</sup> March. This is a timely, and helpful, intervention. The GSMA believes that countries should undertake a full cost benefit analysis of how to use the spectrum released (Digital Dividend) by the switch from analogue to digital terrestrial television.

Where individual countries have undertaken reviews on the use of the digital dividend they have seen a clear benefit in releasing spectrum for non-broadcast use. Within Europe at a member state level there is increasing momentum behind an allocation of harmonised spectrum between 790 and 862 MHz for mobile use. Although this is encouraging there are significant challenges to be addressed before the spectrum can be made available for commercial use. The Commission can play an important role in helping to facilitate an early release of this spectrum.

Delay in the release of the spectrum across Europe is expensive. A report in 2007 by Spectrum Value Partners highlighted a four year delay in the release of spectrum would cost €20 billion in Europe. Delay has a cost and the Commission is encourage to continue motivating and supporting national administrations to manage the digital migration by the year 2012 and to encourage the release of the digital dividend spectrum to support mobile broadband services to the good of European citizens.

However (on balance) the GSMA believes that European Union mandatory binding measures, to force Member States to make a harmonised band available, **would not** be productive at this time. The timeframe for decisions on analogue switch off are from now until the year 2012. It appears unlikely that any binding measure could be put in place before that date. The GSMA believes that the Commission can better achieve the overall objective of harmonised spectrum for mobile broadband by encouragement and by acting as a facilitator.

**Action: Encourage Member States not take undue delays in the switch-off of the analogue television; confirm the objective of the year 2012 for the switch-off and suggesting that Member States undertake a cost benefit analysis of how to use the spectrum released by the year 2010.**

## **Question 1 : expected value to each type of users with incremental use**

*This will focus on the incremental benefits (both quantitative and qualitative) for different uses of the digital dividend spectrum, over and above the use of alternative means of delivering the services (e.g. use of different frequency bands, use of different platforms for delivery of the service). We will also explore the question of what disruptive technologies or business models may emerge in the next 5 to 10 years.*

There have been a number of economic studies done by regulators and mobile operators that look at what the best split of spectrum would be in these bands for mobile and broadcasting. These all show that whilst these might vary from market to market (and depends on time periods assumed), that at least 100 MHz should be made available initially for mobile services from the UHF bands. More spectrum may be required in some markets. For example work by T-Mobile suggests that, in Germany, 160 MHz might be required to “future proof” mobile demand<sup>1</sup>. The studies also make it clear that there is a strong need to harmonise this spectrum to maximise this economic benefit, because this reduces terminal prices (economies of scale), provide for interoperability and roaming, as well as reduces cross border interference.

Access to UHF spectrum<sup>2</sup> is required to combat the digital divide and offer broadband in rural areas in an economically efficient way. The copper local loop needed to support broadband (ADSL) can have problems if the lengths of the copper line (to reach homes) is longer than normal. There can also be problems where telephone exchanges cabins are small and so upgrading them to ADSL is not economically viable. The current development of mobile broadband/HSPA is the most cost effective solution to reach citizens in most cases. This was recognised in Ireland where a mobile operator won the tender to supply broadband coverage to around 30% of the country, to combat the digital divide. This was at 2100 MHz, but access to UHF would make mobile broadband even more cost effective in such rural areas.

These studies are based on the marginal value of spectrum, either for mobile or television broadcasting.

It is not the industry position that **no** spectrum is required for terrestrial broadcasting, but that **not all** the 390 MHz assigned to television broadcasting (470 – 862 MHz) is required.

**Action: Encourage all Member States to undertake cost and benefits analysis in order to clarify choice for the uses of the 470-862 MHz band**

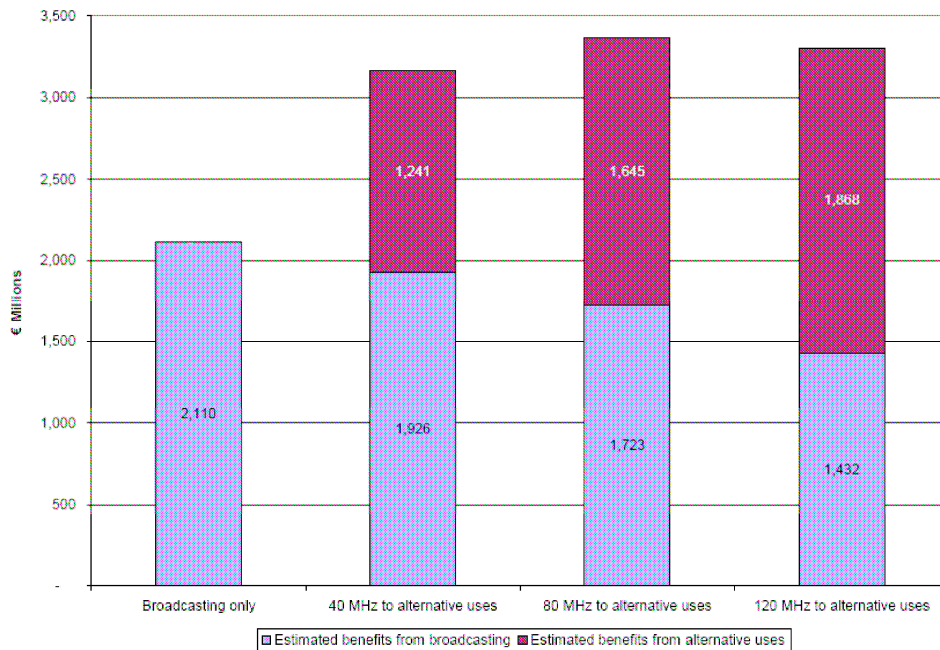
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<sup>1</sup> See Annex 1.

<sup>2</sup> More specifically in the band 470 – 862 MHz

## The Key Economic Studies:

### 1) Europe Economics<sup>3</sup>: How can Ireland best benefit from DD (October 2009)



The analysis shows the maximum combined value (broadcasting and mobile) is between 80 and 120 MHz in Ireland. It goes from € 2.11 billion for broadcasting alone to €3.3 billion for mobile with 120 MHz of Digital Dividend spectrum.

### 2) Analysis Masons : March 08 commissioned by ARCEP (France<sup>4</sup>)

Key findings of the report include:

**Allocating a proportion of the released spectrum for mobile broadband services adds greater value to the economy than if this band were allocated exclusively to digital TV services.** In fact, a scenario that would 'share' the digital dividend between both electronic communications and audiovisual industries would add over €25 billion more to the French economy between the years 2012 and 2024 than allocating the digital dividend exclusively to the digital TV industry.

**Mobile broadband services will support political goals of 'digital inclusion'.** Expanding mobile broadband access – especially in areas that will be underserved by fibre – will be most economically productive, and will significantly reduce the digital divide. Allocation of spectrum to mobile broadband will support the French government's aim of ensuring 100% of the French population has access to fixed/mobile broadband internet by the year 2012.

<sup>3</sup> <http://www.comreg.ie/fileupload/publications/CP50e.pdf>

<sup>4</sup> [http://www.analysismason.com/PageFiles/4324/Valuation%20of%20the%20digital%20dividend%20in%20France%20\(English%20Version\).pdf](http://www.analysismason.com/PageFiles/4324/Valuation%20of%20the%20digital%20dividend%20in%20France%20(English%20Version).pdf)

### **3) Spectrum Value Partners<sup>5</sup>: March 08, Getting the Most out of the Digital Dividend**

Key findings are:

Allocating at least some UHF spectrum to mobile operators would generate between €63 billion and €165 billion in net present value (NPV). This is in addition to the estimated €2.5-5 trillion in NPV that mobile generates for the European economy without any UHF spectrum.

Although results differ from country to country and between scenarios, allocating at least 92 MHz of UHF spectrum to mobile operators would be most likely to maximise additional value for the European economy as a whole.

Allocating considerably more than 92 MHz to mobile operators could also be justified under a range of plausible demand scenarios .

### **4) SCF<sup>6</sup> The Mobile Provide: Economic Impacts of Alternative Uses of the Digital Dividend May - September 2007**

The author of the report stated that “If the mobile industry is allowed to use the spectrum it needs, it could boost Europe’s GDP by as much as 0.6% per year by 2020 generating thousands of jobs throughout the EU. This is because mobile communication brings huge productivity gains allowing all of Europe’s businesses to work more efficiently”.

#### Disruptive technologies

The GSMA does not foresee disruptive technologies in the 5 to 10 year timeframe. For example cognitive radio is unproven and yet to be widely deployed. In any case it seems likely that even if it were to be used, it would be a niche market technology, and not suitable for wide area mobile broadband applications. The issue of using cognitive radio has also been studied by the CEPT who recommend that the UHF band should not be planned on the basis of cognitive radio deployment<sup>7</sup>.

#### ***Conclusion on Question 1***

GSMA believes that the optimum split of spectrum for the time being between broadcasters and mobile broadband is at least 100 MHz. This could be more in some markets, and this demand is likely to grow with time. In such circumstances, GSMA proposes to EC to consider issuing a new mandate to the CEPT to look at developing a band plan below 790 MHz for mobile broadband.

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<sup>5</sup> <http://www.spectrumstrategy.com/Pages/GB/perspectives/Spectrum-Getting-the-most-out-of-the-digital-dividend-2008.pdf>

<sup>6</sup> [www.digitaldividend.eu](http://www.digitaldividend.eu)

<sup>7</sup> ECC Report 132: "light licence-exempt and commons" – [www.ero.dk](http://www.ero.dk)

## Question 2/ The 'European dimension' of the uses of digital dividend spectrum

*This will focus on where there is a 'European dimension' associated with the use of the digital dividend spectrum. This is the focus of the study; we have defined it as the impact (either positive or negative) of decisions made by a Member State about the use of the digital dividend that could affect the use of (and economic value derived from the use of) the digital dividend in other Member States.*

*Examples might include ensuring that services can operate in different countries without harmful interference being caused, ensuring sufficient economies of scale to facilitate equipment availability, triggering investments in mass market services, facilitation of roaming. If 'global dimensions' are also applicable, these should also be identified.*

The GSMA believes that there are significant European dimensions to the digital dividend. The main two are:

1. timely introduction and coordination of spectrum to avoid cross border interference; and
2. economies of scale driving down terminal prices and driving up terminal radio performance.

The costs of interference are due to the nature of the protection offered to broadcasting in this band that will exist after analogue switch off. This could mean that if an country continues to use broadcasting and aeronautical at the top end of the UHF band, this will make the use of this band by its neighbours for mobile broadband very complex. This could lead to large swathes of countries not being able to deploy mobile either because they need to protect broadcasters in adjacent countries, or because the mobile service will suffer too much interference. The GSMA is aware that this is a particularly problem in countries that border Russia. For example Poland and Finland may find that the need to protect aeronautical services means that half of their countries cannot deploy mobile broadband in UHF. If this were to occur then not only would citizens in rural areas lose the benefits of mobile broadband coverage, but it could also significantly reduce the incentive to deploy such networks in these countries. This could lead to a reduction of investment in other markets if this lead to significant reductions in the benefits of economies of scale.

**Action: EC should facilitate discussions with markets outside the EU on issues that are preventing the effective deployment of a harmonised solution in the EU as well as to encourage administrations outside the EU to adopt the CEPT band plan (790 to 862 MHz).**

The other major cost is in the possible lack of economies of scale. Unless all Member States adopt the same frequency plan then terminals will be much more expensive than they need to be. GSMA has done studies with RTT. These show that doubling of costs is not unreasonable. Also the loss of RF efficiency can be large. This erodes the whole point of having UHF for mobile (the ability to cover larger areas with fewer sites). The gain of using this band (over 2100 MHz) is around 8 dB. If we loss 3dB because lack of radio

handset performance, then we have lost a significant part of the benefit of UHF (for cost efficient rural coverage).

Ofcom (UK) in its recent consultation (Feb 09 – “*Clearing the 800 MHz band*”) document has put the costs of €2-3 billion of aligning with other countries: “if we make the same spectrum available as other countries, better mobile broadband services can be provided to consumers at lower cost.”. If this figure were replicated in each country we can see that the cost of not harmonising the frequency bands used could be very high indeed as a total across Europe.

**Action: EC to encourage those administrations outside the EU to adopt the CEPT band plan (790 to 862 MHz) to ensure there is maximum benefit for Europe derived from economies of scale.**

### *Conclusion to Question 2*

There is a significant European coordination dimension to the digital dividend. Decisions made by one Member State can have significant impacts on their neighbours. This is via interference coordination and economies of scale. The need to protect broadcast services in neighbouring countries (if any neighbours remain in the 790 – 862 MHz bands) can make it very difficult for a country to deploy mobile broadband services at UHF.

### **Question 3 - specific cases for action at a European level**

*This will focus on justifying (qualitatively and quantitatively) why there is a need for action to be undertaken at the European level (over and above the actions that Member States can take at national level) in order to ensure that the full benefits (economic, social and cultural) from the proposed uses of the digital dividend spectrum can be realised.*

Specific cases arise out of the need to reduce terminal price and reduce the costs associated with interference. However the way these cases are approached needs to be carefully considered. The industry does not want to see the mandating of frequency bands for mobile broadband undertaken (there is the potential for this to result in institutional deadlock and delay). We believe that the best approach is for some form of third party acting as a facilitator. Specific examples of interventions are:

1. to inform administrations as to the nature and benefits of the Digital Dividend.
2. to help administrations in coming to bi-or multi-lateral agreements with regard to interference issues (with television and aeronautical)
3. to help create a best practice for the migration of services from analogue to digital and to free-up common bands for mobile broadband in Europe.
4. to help create economies of scale by trying to persuade administrations outside the EU to adopt the CEPT band plan (790 to 862 MHz).
5. to encourage administrations to undertake cost benefit analysis of the pros and cons of assigning some spectrum from 470 to 862 MHz for mobile broadband (in line with the CEPT band plan). To offer any help it can with such individual country modelling.
6. issue a mandate to CEPT to consider an band plans below 790 MHz (assuming the economic case justifies the need for more than 72MHz spectrum on a pan-European basis for mobile broadband).

#### ***Conclusion to Question 3***

The EC acting in a facilitator role can encourage as many countries as possible adopt the 790 to 862 MHz bands. This will reduce cross border interference problems between broadcasting and mobile services. The EC can also ensure that the need for more than the 72 MHz identified at WRC07 is identified in good time to help ensure future coordination benefits.

## Question 4 - The nature and timing of any action at the European level

*This will focus on highlighting what action should be taken at the European level, including the specific nature of the action (this could range from a mandated requirement for all Member States to the Commission providing guidance on particular issues) and the timing of the proposed action. We will also explore questions such as: Is there opportunity to create mutually beneficial agreements between potential users prior to the expiration of existing licences/contracts? Should any award of digital dividend spectrum be service and technology neutral?*

### General Answer

There are clear benefits of a harmonised approach to releasing the digital dividend however **a centrally mandated approach**, similar to the GSM Directive, seems **unlikely to be successful** and could potentially slow the process of releasing the Digital dividend down in some Member States. Clearly an institutional stand-off in Europe will not benefit European consumers and should be avoided at all costs.

**Strong leadership** from the Commission in advocating a harmonised European solution is important in order to stress the importance for all member. The Commission should focus on facilitating constructive engagement from all Members States on the issue.

The focus of the Commission activity should be on **providing information** and **practical help** for Member States in planning the digital dividend migration and the introduction of new services. It should not add to the complexity of coordination, or become burdensome on the process, and seek to add value in all its undertakings. It should also not attempt to duplicate any work currently underway.

### Timing:

**Early and clear indications** of the timing of the release of the digital dividend spectrum is critical for investment planning and for investment in R&D from the equipment vendors. The industry is concerned that there will be delays in the analogue switch off and continued uncertainty in the release of digital dividend spectrum. The economic and social impacts of delay will be significant for Europe and the commission should to continue to encourage member states to manage to the 2012 switch off date and to release spectrum for new use as soon as possible after this date.

### Is there opportunity to create mutually beneficial agreements between potential users prior to the expiration of existing licences/contracts?

Once there is a clear roadmap and clear timescales, there is clearly an advantage to negotiate mutually beneficial agreements in advance of the release of the spectrum. Regulatory clarity is extremely important for future planning and investment and the earlier a well defined and clear roadmap is agreed the better.

### Should any award of digital dividend spectrum be service and technology neutral?

There are significant economic and technical benefits derived from harmonisation. For this reason a common and consistent use of spectrum within defined bands will deliver benefits for European citizens.

A technology neutral allocation of the spectrum has advantages allowing for more flexible use and potentially avoiding some of the issues seen refarming 900MHz spectrum in Europe (where a single technology is defined.) This however has to be balanced against

interference issues and the benefits of economies of scale – to facilitate this we would encourage markets to follow the CEPT / ITU band plans.

When considering technology neutrality it is important that frameworks are in place that help to achieve the economies of scale required to deliver consumer benefits but that it is the **market that ultimately decides** on the successful solutions.

**Action: EC to encourage Member States to give clear indications of the timing of the release of the digital dividend spectrum in accordance with CEPT band plan (790 to 862 MHz) by 2010. to ensure there is maximum benefit for Europe derived from economies of scale.**

#### *Conclusion to Question 4*

The mobile industry will be ready to begin using the UHF band for mobile broadband/LTE starting in the year 2011, with large scale network deployments in the year 2012. However this is dependent on clear regulatory signals being sent by the June/July timeframe for standards developing organisation to finalize the necessary specifications by end of the year 2009, and a large enough market to allow economies of scale.

### **Question 5 - Costs and benefits associated with implementing proposed action at European level**

*This will highlight the benefits associated with the proposals for European action(s) together with a discussion of how any costs associated with the proposed action(s) can be best addressed (e.g. in cases where a benefit for one type of users create an impact on other users of the spectrum).*

#### **Benefits**

Ofcom estimated the harmonisation benefits for the UK were worth £2-£3 billion to the UK economy in their 800 MHz consultation. Based on the UK percentage of the European population this would equate to around €20 billion to the EU.

GSMA analysis of the benefits of harmonisation at the handset level showed that fragmentation could reduce the Radio Frequency efficiency by around 50% and could double the handset cost when going from a region the size of the EU to a country the size of the Italy (depending on assumptions). Fragmentation will clearly have a significant cost to European consumers.

#### **Costs**

There are **few direct costs** from the suggested commission actions (facilitating dialogue and helping to plan migrations is a very minor cost relative to the potential benefit). Naturally, in some markets there will be **indirect costs** of clearing the spectrum for some countries on a national basis. It is unlikely there will be a common and consistent formula for assessing what the costs are or how any compensation, if required, will be determined.

In the UK Ofcom estimate a cost of c.£90m - £200m to clear three channels (out of the nine digital dividend channels), the £2-3 billion benefit is however net of these costs.

It is unlikely there will be the Commission role in these negotiations as they will be specific to each Member State. Clearly the sooner there is clear identification of the spectrum the less likely it is there will be fragmentation and the associated costs of retrospectively having to clear spectrum at a later date.

### ***Conclusion to Question 5***

The benefits of Europe as a whole adopting a common harmonised band for the digital dividend in the UHF bands currently used for terrestrial broadcasting in many countries is likely to significantly outweigh any costs associated with replanning digital television bands.

For questions regarding this response please contact:

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***You can see more information about the Digital Dividend on our web site at :***

<http://www.gsmworld.com/our-work/public-policy/spectrum/digital-dividend/index.htm>

## **About the GSMA**

Founded in 1987, the GSMA is the global trade association of the mobile industry, representing more than 750 GSM and 3G mobile phone operators across 218 countries and territories of the world. In addition, more than 180 manufacturers and suppliers support the Association's initiatives as associate members.

The primary goals of the GSMA are to ensure that mobile phones and wireless services work globally and are easily accessible, enhancing their value to individual customers and national economies, while creating new business opportunities for operators and their suppliers. The Association's members represent more than 3 billion GSM and 3G connections - over 86% of the world's mobile phone connections.

The GSMA plays a pivotal role in the development of the GSM platform and the global wireless industry. Much of the GSMA's work is focused on two areas: Emerging Services and Developing Markets. The GSMA helps its members develop and launch new services, ranging from mobile instant messaging to video sharing to mobile Internet access, which will work across networks and across national boundaries. At the same time, the GSMA is heavily engaged in the industry's push to extend basic voice, text and broadband access services to more people and assisting Administrations in developing communications infrastructure in their countries.

GSM is an evolving wireless communications standard that already offers an extensive and feature-rich 'family' of voice and data services. The GSM family of technologies consists of today's GSM, General Packet Radio Service ([GPRS](#)), Enhanced Data rates for GSM Evolution ([EDGE](#)) and third generation GSM services ([3GSM](#)) based on W-CDMA and HSDPA access technologies. Together with LTE (Long Term Evolution), these technologies underpin the GSM platform.

The [GSM Association's Board](#) comprises top-level representatives of some of the world's leading mobile operators, such as AT&T, Bharti Airtel, China Mobile, MTN Group, Orange, Orascom and Vodafone.

## Annex 1 : Spectrum requirements for Mobile Broadband in Germany



## Spectrum demand for mobile broadband

Demand is determined by current usage and market development

- Fundamentals:

- Workgroup of German fixed, all mobile network operators and associations of network operators
- At present mobile networks in Germany provide data rates up to 7.2 MBit/s in urban/metropolitan areas (UMTS/HSPA) but only 0.3 MBit/s countrywide (EDGE)
- Target: Reduction of "Digital Divide" on mid- and long term basis

- Basic assumptions:

- Rural district without any broadband cable infrastructure; all broadband supplied by wireless means
- Viable business case necessary for investment:
  - Due to shrinking broadband gaps no business case for fixed local broadband deployment
  - Business case must be a countrywide mobile broadband deployment
  - Thus extinction of broadband gaps plus enhancement of mobile services
- LTE as technological basis (prerequisites of LTE)



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## Calculation of spectrum demand for countrywide coverage

160 MHz are necessary for future-proof mobile broadband provision

- Assumptions for calculation:

- 6 MBit/s nationwide to be provided by DD-UHF spectrum
- Number of customers per cell: 1000\*
- Average data capacity needed per listed customer : 0.2 MBit/s

$$D_{\text{cell}} = 1000 \text{ customers / cell} \cdot 0.2 \text{ MBit / s} = 200 \text{ MBit / s / cell}$$

\*(Remark: This includes all customers listed - active as well as inactive users within this cell)  
(Remark: The average capacity per ADSL-customer is currently 60 – 150 kBit/s. Thus the assumed figure includes a safety margin to take into account future growth in average traffic.)

- Thus 200 MBit/s is needed in a cell to provide service for 1000 average customers

- Assumed spectral efficiency of LTE: 1.2 bit/Hz/s

$$S = \frac{200 \text{ MBit / s / cell}}{1.2 \frac{\text{bit}}{\text{Hz}} / \text{s}} = 166.7 \text{ MHz}$$

(Remark: The spectral efficiency of the mobile downlink is about 1.6 bit/Hz/s while the efficiency of the uplink is about 0.8 bit/Hz/s because the uplink power is lower. Thus the average efficiency is 1.2 bit/Hz/s)

- Result: Independent from any regulatory framework (e.g. the number of licenses issued) **160 – 170 MHz** of spectrum is required for countrywide broadband coverage



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## Example: 6 MBit/s cell range compared to BWA/UMTS

