



GSMA Public Policy Position

Securing the Digital Dividend for Mobile Broadband

May 2013

Context

The Digital Dividend refers to the spectrum made available for alternative uses when analogue television broadcasting is converted to digital, which is more spectrum-efficient. Initially, the freed-up spectrum made two potential bands available for mobile telecommunications, 790–862MHz (aka the 800MHz band) used in ITU Region 1 (including Europe, Africa and the Middle East) and 698–806MHz (aka the 700MHz band) used in ITU Region 2 (Americas) and Region 3 (Asia Pacific). These frequencies are ideal for mobile, offering good coverage characteristics, reasonable capacity and availability in sufficient blocks for mobile broadband. The 'Digital Dividend 1' refers to the first regional allocation to mobile in the 700MHz and 800MHz bands. More recently, efforts have begun to allocate the 700MHz band to mobile in Region 1 as a 'second Digital Dividend'. These efforts are leading to a global allocation of the 700MHz band for international mobile telecommunications.

Position statements

- Digital Dividend 1 should be allocated to mobile, according to established regional band plans.
- The switch-over to digital television gives broadcasters significantly more capacity for additional channels or high-definition television, even when the Digital Dividend is allocated to mobile.
- The economic benefits of licensing this spectrum to mobile are far greater than allocating it to any other service.
- Digital Dividend radio frequencies have the advantageous characteristics of sub-1GHz spectrum: a balance of transmission capacity, geographic coverage, improved saturation in urban areas and enhanced penetration into buildings.
- Regional harmonisation of the band is necessary to drive economies of scale (keeping handset costs low) and to avoid interference along national borders.
- Governments should not look to generate excessive fees from the licensing of Digital Dividend spectrum, as this will negatively impact network deployment, increase consumer prices and limit the potential economic benefits. Excessive fees can impede policy goals of delivering broadband access to everyone and lead to valuable spectrum remaining unsold.

Background

Towards Mobile Broadband for All

Mobile telecommunications has proven to be among the most transformative and productive technologies in history. Today, with mobile voice communications accessible to most of the world's adult population, the industry's focus has shifted to rolling out broadband connectivity in equal measure — putting the full array of applications and rich content into the hands of citizens through their mobile devices.

In most developed economies, 3G mobile services have been fully rolled out to the population, and fourth-generation LTE services are in the early stages of deployment. These markets are facing the pressure of exploding mobile data consumption, particularly as smartphones and tablets enable people to watch video content.

In many developing countries, 3G services have yet to reach all inhabited areas, and network expansion remains a major focus. The importance of this continued progression cannot be understated. Access to broadband — whether fibre, mobile or satellite — is recognised as one of the main indicators of socio-economic development. Particularly for achieving coverage in rural areas, mobile is the only practical way to deliver broadband service.

Digital television has the advantage of requiring considerably less spectrum for broadcasting than analogue television, while offering a host of new features and additional channels for viewers. When a country makes the transition to digital broadcasting, a considerable amount of prime spectrum is freed up, and some of this has been identified for international mobile telecommunications (IMT) by the International Telecommunication Union (ITU). This is known as the Digital Dividend.

Regional Bands

The international frequency bands for analogue television broadcasting have, until recently, been 470MHz to 862MHz in Region 1 and 470MHz to 806MHz in Regions 2 and 3. The Digital Dividend sits at the upper end of these ranges and is different for the three ITU regions.



Region 2



Region 1



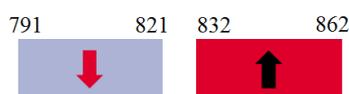
Region 3

At the 2007 World Radiocommunication Conference¹ (WRC-07), the 790–862MHz band (aka the 800MHz band) was allocated for mobile services in ITU Region 1 (including Europe, Africa and the Middle East), with Region 2 (Americas) and some countries in Region 3 (Asia Pacific) mainly opting for 698–806MHz (aka the 700MHz band).

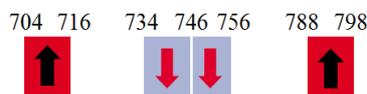
¹ <http://www.itu.int/ITU-R/index.asp?category=conferences&rlink=wrc&lang=en>

Digital Dividend 1 Band Plans

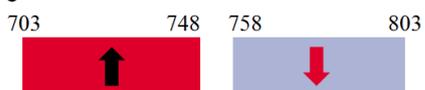
Region 1: CEPT Band Plan — 2x30 MHz



Region 2: United States Band Plan — 2x22 MHz



Regions 2 and 3: APT Band Plan — 2x45 MHz



At WRC-12, a second Digital Dividend in the 700MHz band was allocated to mobile in Region 1, and efforts are being made to align this band with the 700MHz Asia Pacific Telecommunity (APT) band plan, which is also taking hold in Latin America, creating a near-global harmonised band. The United Arab Emirates was the first Region 1 country to allocate Digital Dividend 2 to mobile, following the GSMA's preferred 2x30 MHz band plan.

Rationale

1. Digital Dividend 1 spectrum should be allocated to mobile, according to established regional band plans.

Securing the Digital Dividend for mobile is a unique opportunity to deliver broadband for all. In an increasingly crowded field of spectrum-using services, there may never be another opportunity to reallocate a large block of spectrum without having to displace multiple services and businesses that are currently using the spectrum — a difficult and time-consuming process even under the best circumstances. Furthermore, the Digital Dividend falls in the sub-1GHz 'sweet spot', comprising the ideal frequencies for deploying mobile broadband over large coverage areas, with far less infrastructure than would be necessary with higher-frequency transmissions.

Many national telecommunications regulators have begun the process of clearing the Digital Dividend band for mobile operators to use, while others have already licensed the spectrum for broadband services. However, a large number of countries have not yet released all of the Digital Dividend spectrum or even begun the transition to digital broadcasting.²

2. The switch-over to digital television gives broadcasters significantly more capacity for additional channels or high-definition television, even when the Digital Dividend is allocated to mobile.

The conversion to digital terrestrial television (DTT) creates a true win-win situation. Digital television provides broadcasters with a more flexible and efficient technical platform to deliver standard-definition and high-definition programming, as well as more consumer choice

² Refer to Plum and Farncombe 2013, Practical Recommendations for Digital Switchover, <http://www.gsma.com/spectrum/dsoguide2013>.

through additional television channels, multimedia, and radio and data services. Meanwhile, mobile operators gain the spectrum they need to deliver mobile broadband services. Citizens gain from affordable access to both.

3. The economic benefits of licensing this spectrum to mobile are far greater than allocating it to any other service.

The mobile industry is by far the most productive user of spectrum, generating economic value directly through mobile network business, indirectly through the ecosystem of mobile-related businesses and in the wider economy by increasing business productivity across all sectors that use mobile services. In Europe, for example, the mobile sector uses approximately 15% of the radio spectrum between 4MHz and 5GHz, while generating 50% of the economic value derived from this spectrum (Plum, 2013).

Releasing the Digital Dividend for mobile services creates an economic ripple effect. The GDP contributions of mobile go far beyond the direct commercial impact, which generates employment, taxes and network investments. Mobile broadband services are the backbone of an ecosystem of mobile-oriented business:

- Device manufacturers and operating system developers are driving innovation in the race to make smartphones faster, lighter and more intuitive to use.
- Network infrastructure vendors are striving for further efficiencies, as they seek to support the network demands of tomorrow at lower cost.
- Content providers are harnessing the new hardware and software innovations to generate new products and services.

Even beyond the industry ecosystem, mobile broadband strengthens every sector in the wider economy by increasing productivity and providing access to email, applications and the internet at any time. It gives people important new ways to learn and to do business and to buy things. This effect is even stronger in developing countries than in developed economies.

4. Digital Dividend radio frequencies, which have the advantageous characteristics of sub-1GHz spectrum, offer an excellent balance between transmission capacity and geographic coverage, improved saturation of urban areas and enhanced building penetration.

Low-frequency, sub-1GHz spectrum is ideal for providing fast and reliable mobile broadband service, indoors and outdoors, in both rural and urban areas. It enables mobile operators to build low-cost networks capable of handling the explosion of data consumption. Deploying a network that uses higher-frequency capacity bands requires more base stations to cover the same area. Rolling out a 700MHz based network comes to only 30% of the cost of rolling out a 2100MHz-based network, and this translates into greater access and a more affordable service for customers.

5. The Digital Dividend is a key enabler of universal broadband access, bringing socio-economic benefits to people in cities as well as rural and remote areas where fixed-line penetration is low.

Giving all citizens access to mobile broadband requires action from both government and industry. Mobile operators, who have raised funds and started to roll out mobile broadband networks, are developing business plans to ensure they can provide sufficient capacity to meet future demand. Governments now need to provide clear, consistent regulation and sufficient spectrum to support these plans.

At least a threefold increase in spectrum availability will be required by 2020 to meet the predicted growth in demand for mobile broadband services. This spectrum will be found in a number of bands, but for the provision of universal broadband access, the most important is the low-frequency UHF band where the Digital Dividend sits.

6. Regional harmonisation of the band is necessary to drive economies of scale (keeping handset costs low) and to avoid interference along national borders.

As the United Nations body overseeing global telecommunications, the ITU manages the Radio Regulations, a treaty governing the international use of the radio spectrum. Spectrum harmonisation — the uniform use of spectrum bands across regions — is a key objective of the ITU, national regulators and the whole of the mobile industry. In fact, it is spectrum harmonisation that, combined with widely adopted international standards, has driven the remarkable growth and uptake of mobile technology.

The harmonisation of mobile frequency bands creates a virtuous circle of benefits. International roaming leads to region-wide markets composed of billions of people. This in turn creates economies of scale for the manufacture of mobile devices, lowering consumer prices and, ultimately, creating more demand for products and services.

7. Governments should not aim to generate excessive fees from the licensing of Digital Dividend 1 spectrum, as this will negatively impact network deployment, increase consumer prices and limit the potential economic benefits. Excessive fees can impede policy goals of delivering broadband access to everyone and lead to valuable spectrum remaining unsold.

Some national regulators have viewed spectrum auctions as an opportunity to raise a large amount of cash for the government, and therefore they set reserve prices very high. However, excessive licence fees erode operators' ability to make the necessary investments in network infrastructure, which increase citizens' access to mobile broadband and close the digital divide.

Furthermore, if reserve prices are set too high, regulators can create a situation where no one bids on the spectrum, leaving this valuable resource unused until a new auction is arranged, as recently experienced in Australia. Unsold mobile spectrum is not only inefficient, but it undermines the legitimacy of auction prices by creating artificial spectrum scarcity.



Furthermore, future attempts to license unsold spectrum could be challenged by bidders that paid more in the first auction.

Reserve pricing for spectrum auctions should be set at a level that discourages frivolous and speculative bidding, but not so high as to discourage participation from serious bidders. Above all, the cost of spectrum rights should be based on achieving the best outcomes for society, rather than generating short-term revenue for the government.

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GSMA Government and Regulatory Affairs

A country's citizens benefit most when the private and public sectors work together in a spirit of openness and trust. To this end, the GSM Association is committed to supporting governments and regulators in their efforts to introduce pro-investment telecommunications policies.

The GSMA's government and regulatory affairs team represents the mobile industry around the world, advocating for a regulatory environment that encourages investment, maximises innovation and creates opportunity for mobile operators, the wider mobile ecosystem and mobile users. Through direct engagement with governments, we help to shape the global regulatory agenda.

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