

SUBMISSION TO ARCEP(FRANCE) CONSULTATION ON DIGITAL DIVIDEND

INTRODUCTION

Dell, Google, and Microsoft (collectively the 'Informal Group') welcome the opportunity to respond to the public consultation published by *Autorité de régulation des communications électroniques et des postes* ('Arcep') on the authorisation of the 800 MHz and 2.6 GHz bands for mobile broadband. We support the work carried out by Arcep to make this spectrum available for innovative services and urge Arcep to move ahead quickly to allow for the deployment of mobile broadband as soon as possible. To achieve this, Arcep should ensure that spectrum is made available for new entrants in a way that assures increased competition in the mobile broadband market, which will in turn lead to innovative services for consumers at competitive prices. The Informal Group also believes that the UHF band allocated to broadcast services can be used for wireless broadband by employing new technology. Our members have invested significant time and resources in the development of software and devices that will enable innovative, licence-exempt use of the interleaved spectrum between television channels for broadband applications, and believe that this spectrum, known as 'white spaces', will help Arcep meet these goals for maximising access to broadband services and for achieving the most efficient use of spectrum for France.

INCREASING COMPETITION: BENEFITTING CONSUMERS

When assessing how many operators should be allowed access to the two spectrum bands highlighted in this consultation, Arcep should strive to ensure that the spectrum allocation process produces the maximum benefit for French interests.

Licence-exempt use of UHF-TV band spectrum by white space devices obviously increases competitive use of spectrum, to the benefit of French citizens.

USING UHF-TV SPECTRUM FOR INNOVATIVE TECHNOLOGIES

Arcep and the French government more broadly have already taken significant strides in making use of the Digital Dividend. If competition is allowed to thrive in each new service enabled, the Digital Dividend will benefit French citizens through sustainable economic growth and technical innovation. While much of the focus has been on clearing spectrum and the potential of the 800 MHz band to deliver enhanced mobile services, we believe that there is much to be gained from exploiting unused capacity within the spectrum retained for broadcasting – an action we believe should follow quickly from this consultation. As the European Parliament has made clear, there is substantial "social, cultural and economic value [in] allowing licence-exempt use of [these] currently unused [television broadcast] frequencies."¹ One of the most compelling applications for interleaved television broadcast frequencies ('UHF-TV') is high-speed access to the Internet, the benefits of which are well-established. Compared to higher frequencies, broadband devices operating in the UHF-TV bands offer longer transmission ranges using the same power, with less risk of signal attenuation or harmful interference, or the same range with lower power consumption.

¹ See European Parliament Resolution of 24 September 2008 on Reaping the Full Benefits of the Digital Dividend in Europe: a Common Approach to the Use of the Spectrum Released by the Digital Switchover (2008/2099(INI)), para. 30, available at <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P6-TA-2008-0451+0+DOC+XML+V0//EN>. ("Digital Dividend Resolution").

These favourable characteristics² reduce implementation costs and will help increase broadband penetration in unserved and underserved areas throughout France. Innovations in wireless technology, and the resultant increases in broadband access, will also help France to meet the goals of the i2010 Strategy – in particular the goals of extending the values of inclusion and quality of life to the Information Society.³ Advances in spectrum aware wireless technology now permit highly-efficient use of UHF-TV spectrum for wireless data services without causing harmful interference to incumbent licensed services.

France should not delay developing policies that would allow it to take advantage of new wireless technologies – such as white space devices – that will support the policy to increase the availability of broadband to its citizens. However, it would be prudent to keep sight of the work of the Electronic Communications Committee (ECC) in this regard. Within the ECC, SE 43 has recently been established to define technical and operational requirements for the operation of cognitive radio (CR) systems in the white spaces of the UHF broadcasting band (470-790 MHz), both to ensure the protection of incumbent radio services/systems and to investigate the consequential amount of spectrum potentially available. The Informal Group notes that white space devices may incorporate aspects of CR and software-defined radio technology, or may include one or the other, or neither; they may, in fact, simply operate with remote databases for awareness of local spectrum usage. Nonetheless, once SE 43's work is completed, EU regulation on the harmonisation of such spectrum would facilitate bringing to market innovative devices for consumers at competitive rates, thereby realising fully the potential of the Digital Dividend.

TIMING AND WORKABILITY OF THE POLICY

Spectrum aware devices for certain applications are available in the market today, and related devices could be successfully deployed in the white spaces. French policymaking is well-positioned to keep pace with these developments. Moreover, the stage of development of such technologies for the mass market is underscored by the extent to which the devices' operational parameters are well-defined and well-understood. For instance, some modern mobile telephones are spectrum-aware, and employ frequency hopping, control signals, geolocation as well as adjusting transmitter power based on environmental sensing. It is useful to note in this context that the UK telecommunications regulator, Ofcom, has recently completed a consultation on licence-exempting cognitive devices using interleaved spectrum in anticipation of forming national regulation that would allow the UK to take advantage of these technologies as early as possible.

Advances in spectrum aware wireless technology permit highly efficient use and reuse of UHF-TV spectrum for providing wireless data services without causing harmful interference to incumbent licensed users. This is the primary consideration for enabling access to

² UHF-TV spectrum is well-suited for high-speed wireless data networks because of its desirable propagation characteristics. Indeed, UHF-TV spectrum is particularly desirable for wireless data networks for many of the same reasons that it was chosen to transmit television broadcasts: compared to other parts of the spectrum capable of transmitting high-speed data at equivalent transmitter power transmissions in UHF-TV spectrum travel further, and also are more capable of penetrating walls, dense foliage, and other obstacles. However, because of the number of other, highly portable uses of this spectrum, such as PMSE use where available UHF spectrum at any given location is subject to change, it is not conducive to licensing.

³ See generally i2010 - A European Information Society for Growth and Employment, available at http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm; see also Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the second periodic review of the scope of universal service in electronic communications networks and services in accordance with Article 15 of Directive 2002/22/EC – Exchange of Views, 7 November 2008 (Commission has acknowledged that broadband access is on the point of becoming essential to the well-being and e-Inclusion of the population).

interleaved UHF-TV band spectrum. In the United States, the Federal Communications Commission (FCC) has mandated⁴ that devices use transmit power control (TPC) to use the minimum power necessary to establish reliable communications.⁵ In general, UHF-TV band devices can avoid harmful interference to incumbent operations by employing one or more of several technologies⁶. We commend these to Arcep for consideration in national policymaking.

CONCLUSION

There is much more spectrum allocated (or set aside) for television broadcasting in France than is actually used to deliver television programming. Low-power spectrum aware devices, operating within an appropriate framework, can use or reuse interleaved spectrum without causing interference to licensed users, and in doing so offer significant opportunities for consumers, businesses, and educational users across France.

⁴ Second Report and Order and Memorandum Opinion and Order (“Second R & O”) adopted November 4, 2008, released November 14, 2008 (FCC 08-260)

⁵ FCC Second R&O paras. 230-32.

⁶ *Geolocation.* A UHF-TV band device also can avoid causing harmful interference if the device is provided with a list of the occupied television channels in the intended area of operation. This approach requires the use of two technologies: a method of determining the location of the UHF-TV band device, and a database of available channels at a given location. For fixed UHF-TV band devices such as access points for “last mile” connectivity, such devices can be professionally installed and their location then programmed into the device. Personal computers and other portable devices can use geolocation technologies such as global positioning system chips or triangulation using radio towers, to determine their location at a given point and time. Once the device knows its location, it can communicate over the Internet with a database to determine the channels available for use in its area. This approach is often useful for UHF-TV band devices that will operate at higher transmit powers in order to minimise the risk of harmful interference to television broadcasts. The US FCC has determined that portable devices using a geolocation approach can operate at twice the power authorised for devices relying on spectrum sensing alone, and also has adopted this approach for fixed wireless access points.

Spectrum sensing. Spectrum sensing systems using “listen before talk” (“LBT”) techniques. They scan a range of UHF-TV channels to determine which spectrum is being used by incumbent operations and then avoid them. By detecting television signals at power levels much lower than those used to transmit viewable television signals, LBT devices can ensure that nearby television viewers’ signals are protected.