

# DIGITALEUROPE views on WRC-15 Agenda Items 1.1, 1.2 and 10

Brussels, 12 January 2015

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## 1. Introduction

The ITU World Radiocommunication Conference 2012 (WRC-12) agreed on:

- WRC-15 Agenda Item 1.1: “to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for IMT and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC 12);”
- WRC-15 Agenda Item 1.2: “to examine the results of ITU-R studies, in accordance with Resolution 232 (WRC-12), on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;”
- WRC-15 Agenda Item 10: “to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention.”

CPM15-1 then decided to establish Joint Task Group (JTG) 4-5-6-7 in charge of the preparation of WRC 15 Agenda items 1.1 and 1.2. The terms of reference (ToR) of JTG 4-5-6-7 define the tasks it shall undertake and the way it shall co-ordinate its work with ITU-R Working Parties. The ToR call for WP 5D to provide

*“the spectrum requirements for the mobile service, including suitable frequency ranges, and other specific requirements as well as results of studies from any concerned Working Parties on technical and operational characteristics, spectrum requirements and performance objectives or protection requirements of other services;” (Decides 3) and for Working Parties 5A and 5D to provide spectrum requirements (Further Decides 4).*

DIGITALEUROPE hopes that this position paper will assist administrations in finalising a European position on WRC-15 Agenda Items 1.1, 1.2 and 10. This would enable Europe to take a leadership position to drive the spectrum harmonization process as early as possible within the ITU-R.

## 2. Agenda Item 1.1: Suitable frequency ranges and candidate bands<sup>1</sup>

DIGITALEUROPE assessed a number of suitable frequency ranges currently considered under A.I.1.1 and developed the following views on the candidate bands.

### 2.1. The below 1 GHz range

#### 470-694 MHz

DIGITALEUROPE invites CEPT, the HLG and the RSPG thoroughly to explore the scenario of SDL for mobile services in the 470 – 694 MHz band as this would be a catalyst for the development of further convergence between mobile services and the delivery of broadcast content. In order to realise this opportunity, DIGITALEUROPE advocates:

- The investigation and development of an appropriate regulatory and spectrum licensing regime for the range 470-694 MHz taking careful account of all the numerous stakeholder interests. Given the importance of DTT, this framework should preserve current and future deployments of DTT, and avoid any disruption to current and future DTT installations. This implies for instance that potential licensees must not interfere with legacy DTT receiver installation and that re-planning additional DTT deployments or redeployment of the latter must be possible without additional constraints for DTT on a national or international level.
- Equally, it appears that DTT will continue to evolve and will remain an important delivery system in many Member States. An evolution of DTT delivery is beneficial for the availability of spectrum. As a consequence, introducing policies for DTT evolution in countries is recommended. For example, a voluntary policy towards DTT next generation systems (driven by better DTT service and or subsidies for users) together with concerned stakeholders in the member states may help to release spectrum whilst helping the DTT ecosystem to evolve.

DIGITALEUROPE's [White Paper on Supplemental Downlink in the UHF Band](#) provides a thorough overview of the challenges and opportunities related to SDL.

### 2.2. The 1.0-1.7 GHz range

This frequency range is interesting both from a capacity and coverage perspective since it is intermediate band between 1 GHz and 2 GHz. In addition, the L-band has a unique opportunity to provide some large channel (e.g. 20 MHz or 40 MHz). The various sub-bands within this range have different status due to various legacy applications at national as well as regional levels. DIGITALEUROPE thus considers important to assess specific candidate bands within this range taking into account CEPT allocations and requirements. Those bands would subsequently be made available in a phased and compatible manner.

#### 1350-1400 MHz

<sup>1</sup> JTG 4-5-6-7 Plenary meeting in July 2012 agreed that "suitable frequency ranges" should be understood as a wide range of frequencies which by their characteristics would be suitable for the implementation of IMT applications. "Candidate bands" would designate precise bands that would be proposed for Mobile Service allocation and/or IMT identification, taking into account constraints other than just their suitability for IMT, such as compatibility with existing services and other criteria.

Concerning the future use of the 1350-1400MHz band, the band hasn't received the support of most CEPT administrations having expressed their views at the CPG PTD and CPG level (Category 3, i.e. not supported for mobile broadband at WRC-15). DIGITALEUROPE noticed that there is some support outside Europe. DIGITALEUROPE will monitor the development of this band in the near future.

### **1427-1452 MHz**

CEPT supports the identification for IMT of the band 1427-1452 MHz. DIGITALEUROPE emphasizes the fact that this band is already allocated to the mobile service in the three ITU-R Regions. However, limits set to protect adjacent EESS (passive) operating in the band 1400-1427 MHz may make utilization by IMT systems problematic, at least in the lower part of the band.

As CEPT recognizes, identification of 1427-1452 MHz for IMT presents the following advantages:

- A possible global identification to IMT, and,
- The possibility to implement large IMT blocks within the band 1427-1518 MHz, in association with the bands 1452-1492 MHz and 1492-1518 MHz.

On the other hand, the protection of the passive services below 1427 MHz would impose severe limitations to the deployment of IMT in the frequency range immediately above 1427 MHz, and so, a large guard band will likely result in the Out-Of-Band Emission limits imposed to IMT terminals or base stations.

DIGITALEUROPE along with CEPT are in favour of supporting the general position of the mobile industry for an identification of the band 1427-1452 MHz for IMT – despite the fact that some restrictions that will be imposed to the implementation of IMT make this band rather unattractive as a stand-alone IMT band, and that its identification should be associated with the identification of other parts of the L-Band.

### **1452-1492 MHz**

CEPT decided to harmonise this band for mobile broadband supplemental downlink (SDL). This decision was based on the conclusions of ECC Report 188. These 40 MHz have been sitting unused for the past 10 years in Europe and in many countries globally. The ECC adopted ECC Decision(13)03 designating this band for Mobile/Fixed Communications Networks SDL. DIGITALEUROPE supports this Decision and believes it allows Europe to take an early leadership to drive the global harmonisation of the band plan for those 40MHz. DIGITALEUROPE supports the identification of this band for IMT at WRC-15.

### **1492-1518 MHz**

Concerning the future use of the 1492-1518 MHz band, the band received the support of most CEPT administrations having expressed their views at the CPG PTD and CPG level (Category 1). This band is already allocated to the mobile service in the three Regions, and the potential for a worldwide IMT identification seems very high. This results in the possibility to develop a global market, with its obvious benefits of economies of scale and terminal availability for the end customers. DIGITALEUROPE supports the identification of the band 1492-1518 MHz for IMT under A.I.1.1 of WRC-15.

### **1518.2-1660.5 MHz**

Some countries in Region 3 are investigating the potential use of MSS bands in 1518-1675 MHz to support the development of Mobile broadband services. Those are the bands 1525-1559 MHz and 1626.5 – 1660.5 MHz. Some countries in Region 1 also proposed those bands. However, Region 2 and several Region 1 countries are likely to be reluctant to support this identification of those 1.5/1.6 GHz MSS band (current MSS GEO allocations are 1518 - 1525 MHz/1525 - 1559 MHz/1626.5 - 1660.5 MHz and 1668 - 1675 MHz) and other service providers

(satellite and military services) will likely oppose the introduction of IMT in this band. DIGITALEUROPE supports compatibility studies in order to better assess the use of these bands by terrestrial IMT.

## 2.3. The 2 - 4 GHz range

### 1900-2290 MHz

The bands 1900-2025 MHz and 2110- 2200 MHz are currently identified worldwide for IMT.

In Europe, parts of these IMT bands are already harmonized and used for IMT:

- FDD: 2x60 MHz in the paired bands 1920-1980 MHz and 2110-2170 MHz,
- TDD: 35 MHz in the bands 1900-1920 MHz and 2010-2025 MHz.

The usage of the 1900-1920 and 2010-2025 MHz bands is in practice rather limited. CEPT is currently considering using the TDD bands for new non-IMT applications.

In order to provide in the future efficient IMT-Advanced solutions within the 2 GHz range, the mobile bands in this frequency range may be extended to support enhanced capacity with minimal hardware modifications as current IMT networks and devices already operate in this frequency range. This could be done by designation of the bands 2025-2110 MHz and 2200-2290 MHz for IMT and inclusion of these additional bands into the extended channel arrangement.

However, it should be noted that these bands are allocated to fixed, mobile, space research, Earth exploration satellite and space operation services on a worldwide basis and are used by thousands of satellites for telemetry, tracking and command (TT&C) networks. Therefore, if the 2025-2100 and 2200-2290 MHz are decided to be included in the scope of AI 1.1, the appropriate sharing studies would need to be conducted.

Therefore, DIGITALEUROPE may support the consideration of the bands 2 025–2 110 MHz and 2 200–2 290 MHz, or parts of them, by WRC-15 for a designation for IMT based upon the outcome of any sharing studies

### 2700-3300 MHz

The 2.7- 2.9 GHz band is adjacent to the 2500-2690 MHz IMT band, where current 4G networks are being deployed. It would present similar propagation conditions. The band 2700-2930 MHz is currently allocated to Aeronautical Radio Navigation Services (ARNS) and radiolocation services on a worldwide basis. This band is being supported by many organisations for future IMT allocations. In that context, DIGITALEUROPE also supports the identification of this band for IMT.

In addition, in most countries there are local areas with very high population densities where there is a need for extremely high capacity. In that context, some European administrations proposed 2700-3100 MHz as a suitable frequency range. DIGITALEUROPE thus supports the sharing studies and the designation of a substantial part of the band 2700-3300 MHz for IMT, at least the band 2.7-2.9 GHz and preferably the band 2.7-3.1 GHz with hopefully a worldwide identification.

### 3300-3800 MHz

This band also provides a large bandwidth for mobile broadband systems that facilitates high data rate transmissions as well as capacity. It is better to examine this band in a segmented fashion as it provides more detailed view of the situation.

### 3300-3400 MHz

Currently 29 countries allocated this band to the fixed and mobile services on a primary basis<sup>2</sup>. This band is allocated Radiolocation Service on a primary basis.

### 3400-3600 MHz

This band is allocated to mobile service and, in addition, identified for IMT in several countries in Regions 1 or 3. For example in Region 1, it is fully allocated to mobile on a primary basis and “identified” for IMT in 82 countries<sup>3</sup>, see also Radio Regulations, Footnote 5.430A

In Region 2 the band is also allocated to mobile on a primary basis in 14 countries (US and Canada not included in the list), see Footnote 5.431A. Finally in Region 3, it is also allocated to mobile on a primary basis and “identified” for IMT in some key markets; see also Radio Regulations, Footnotes 5.432A, 5.432B and 5.433A.

Usage of the band for IMT is possible in EU countries in the context of "terrestrial systems capable of providing Electronic Communications Services" based on the Commission Decision 2008/411/EC (May 2008), and in the context of Mobile/Fixed Communications Networks (MFCN) in those CEPT countries implementing ECC/DEC(11)06 (December 2011). Sharing with FSS will need to be investigated.

### 3600-3800 MHz

The band 3600-3800 MHz is allocated to Fixed and Fixed Satellite Services (FSS) worldwide. The band is also allocated to the Mobile Service on a primary basis in Regions 2 and 3, and on a secondary basis in Region 1.

This band is not identified for IMT although usage of this band for IMT in the context of "terrestrial systems capable of providing terrestrial communications services" is possible in EU countries based on the Commission Decision 2008/411/EC (May 2008), and more generally in the context of MFCN for CEPT countries implementing ECC Decision (11)06 (December 2011). Here again, as in 3400-3600 MHz, sharing with FSS will need to be evaluated.

## 2.4. The 4 - 5 GHz range

The band 4400-5000 MHz is already identified for the Mobile Service on primary basis in all 3 Regions of ITU at WRC-07. The size of the band would accommodate IMT-Advanced systems which are envisaged with large bandwidth and would provide significant capacity and performance (higher bit rates/higher data rates with cell sizes <500m). However, propagation characteristics are not as favourable in comparison with other bands mentioned above. Furthermore the band 4500-4800 MHz is part of the FSS plan of Appendix 30B.

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*2 Saudi Arabia, Bahrain, Bangladesh, Brunei Darussalam, China, Congo (Rep. of the), Korea (Rep. of), Côte d'Ivoire, the United Arab Emirates, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, the Libyan Arab Jamahiriya, Japan, Jordan, Kenya, Kuwait, Lebanon, Malaysia, Oman, Uganda, Pakistan, Qatar, the Syrian Arab Republic, the Dem. People's Rep. of Korea and Yemen.*

*3 Albania, Algeria, Germany, Andorra, Saudi Arabia, Austria, Azerbaijan, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Botswana, Bulgaria, Burkina Faso, Cameroon, Cyprus, Vatican, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Egypt, Spain, Estonia, Finland, France and French overseas departments and communities in Region 1, Gabon, Georgia, Greece, Guinea, Hungary, Ireland, Iceland, Israel, Italy, Jordan, Kuwait, Lesotho, Latvia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Lithuania, Malawi, Mali, Malta, Morocco, Mauritania, Moldova, Monaco, Mongolia, Montenegro, Mozambique, Namibia, Niger, Norway, Oman, Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, Czech Rep., Romania, United Kingdom, San Marino, Senegal, Serbia, Sierra Leone, Slovenia, South Africa, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia, Turkey, Ukraine, Zambia and Zimbabwe as well as Bangladesh, China, India, Iran (Islamic Republic of), Japan, Korea (Rep. of), New Zealand, Pakistan and French overseas communities in Region 3.*

## 2.5. The 5 - 6 GHz range

The bands 5350-5470 MHz and 5850-5925 MHz have been proposed for terrestrial mobile broadband applications. This would result in RLAN devices being able to operate within one large uninterrupted block of frequencies from 5150 MHz up to 5925 MHz. This would allow several 160 MHz non-overlapping channels to be utilized by devices in the band.

DIGITALEUROPE notes the diversity of devices utilising Broadband Wireless is growing rapidly and that wireless is becoming the default way in which devices connect to the Internet. Current Wireless Access Systems (WAS) and Radio Local Area Networks (RLANs) already support an important share of overall internet traffic and this share is expected to grow even further. To address the future capacity needs of RLANs, DIGITALEUROPE is focused on additional spectrum in the 5 GHz Band (5350-5470 MHz) to allow users to take full benefit of the newly developed high throughput/high bandwidth technologies. DIGITALEUROPE notes identification of 5350-5470 MHz as an extension of RLAN will require agreement on appropriate mitigation techniques to avoid interference to existing services e.g. radiolocation and Earth Exploration Satellite Service, and that work is ongoing on potential mitigation techniques but this will not be finalised before WRC-15. DIGITALEUROPE therefore supports development of a future WRC Agenda Item on 5350-5470 MHz to allow further discussion on mitigation techniques and consensus building.

## 3. Agenda Item 1.2: 694-790 MHz

The WRC-12 has decided to allocate the 700 MHz band, below and adjacent to the 800 MHz band, on a co-primary basis to both the mobile services and the broadcast service in ITU Region 1. This will be effective after the next WRC in 2015 (WRC-15). ITU-R has been tasked to carry out co-existence studies, develop frequency arrangements and help define the exact lower band edge, under WRC-15 Agenda Item 1.2.

DIGITALEUROPE recommends repurposing the band for MBB but considers essential that a re-farming of the band is performed with no disruption of the DTT service and with minimum impact on the DTT consumers. The process should be prepared in close cooperation between Consumer Electronics (CE) and mobile industries, taking into account their respective roadmaps.

DIGITALEUROPE draws the attention to specific aspects on technology migration developed in its cover letter in response to the consultation on UHF.

Regarding the channeling arrangement for mobile broadband, DIGITALEUROPE supports leveraging on 3GPP Band 28 as an extension and in a compatible manner with Band 20 (EU800 MHz). This triggers economies of scale and enables roaming across all ITU regions.

DIGITALEUROPE's [full position on the 700 MHz Band](#) provides further details and considerations related to Agenda Item 1.2.

## 4. Agenda Item 10: The above 6 GHz range

DIGITALEUROPE notes the contributions to the WRC preparation process on the possible use of higher frequencies above 6 GHz for Mobile Broadband Services (MBB). Whilst these frequencies might not be best suited for wide area coverage or high mobility, the possibility for contiguous allocations in higher frequency bands may provide opportunities for very high capacity localised access on mobile devices. Noting that WRC-15 agenda item 1.1 addresses MBB traffic growth up to around 2020, forecasts point towards continuing growth

also beyond 2020 indicating that new spectrum bands need to be made available beyond 2020. It is expected that new spectrum bands above 6 GHz, including mmWaves not previously considered for MBB, will play a crucial part in satisfying the need for such MBB services.

The benefits to stakeholders will incorporate a substantial increase in data rates and capacity, a massive increase of connectivity capabilities, a substantial reduction of latency, energy-efficient systems and devices as well as lower deployment and operational costs. This will enable new services, connect new industries and empower new user experiences.

Consequently DIGITALEUROPE supports an Agenda Item for WRC-19, through a European Common Proposal (ECP), for the allocation of additional spectrum for Mobile Services and identification for IMT to enable 5G.

DIGITALEUROPE's [Vision for 5G Spectrum](#) provides further details and consideration concerning this topic.



## Annex: Overview of DIGITALEUROPE Position

Suitable frequency ranges	Candidate bands (MHz)	DIGITALEUROPE Position
Below 1 GHz Range	470-694	<ul style="list-style-type: none"> <li>- Support study of converged networks (broadcast and mobile) taking into account all aspects</li> <li>- Recommends study of SDL in order to introduce flexibility in the band</li> <li>- SDL should preserve current and future deployments of DTT, and avoid any disruption to current and future DTT installations</li> <li>- 700 MHz process and associated evolutions of DTT service in 470-694 should have priority over SDL introduction</li> </ul>
	694-790 (A.I.1.2)	<ul style="list-style-type: none"> <li>- Support repurposing the band for MBB</li> <li>- Essential to ensure that process comes with no disruption of the DTT service and minimal impact on DTT user</li> <li>- Roadmaps should be developed in cooperation with CE and mobile industry.</li> <li>- Recommends MBB channelling arrangement leveraging 3GPP Band 28 and compatible with Band 20 (EU800 MHz).</li> </ul>
1.0-1.7 GHz Range	1350-1400	- DIGITALEUROPE pays attention to the development of this band and monitors the activities in this band.
	1452-1492	<ul style="list-style-type: none"> <li>- Support the use of the band for mobile broadband Supplemental Downlink (SDL)</li> <li>- Support IMT identification</li> </ul>
	1427-1452	<ul style="list-style-type: none"> <li>- Support IMT identification</li> <li>- Protection of passive services below (1400-1427 MHz) should be ensured.</li> </ul>
	1492-1518	- Support for IMT identification
	1518-1660.5	- Support sharing studies between MSS and IMT
2 - 4 GHz Range	1900-2290	- Support sharing studies
	2700-3300	- Support sharing studies and the designation of a substantial part for IMT (at least the band 2.7-2.9GHz and preferably the band 2.7-3.1GHz)
	3300-3400 3400-3600 3600-3800	<ul style="list-style-type: none"> <li>- Support IMT identification</li> <li>- Support sharing studies with Radiolocation service</li> <li>- Identified for IMT for the first portion, but not identified for the second half.</li> <li>- Support the use of the band 3400-3800 MHz for IMT in the context of MFCN as expressed by both EC and ECC decisions</li> </ul>
4 - 5 GHz Range	4400-5000	- Already identified for the Mobile Service on primary basis in all 3 Regions of ITU at WRC-07.
5 - 6 GHz Range	5350 – 5470	- Support development of a future WRC Agenda Item on 5350-5470 MHz to allow further discussion on mitigation techniques and consensus building.
Above 6 GHz	Bands above 6 GHz	- Support an Agenda Item for WRC-19 for allocation of additional spectrum for Mobile Services and identification for IMT to enable 5G



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For more information please contact:  
 Marc Soignet, DIGITALEUROPE's Policy Manager  
 +32 2 609 53 37 or marc.soiignet@digitaleurope.org

## ABOUT DIGITALEUROPE

**DIGITALEUROPE** represents the digital technology industry in Europe. Our members include some of the world's largest IT, telecoms and consumer electronics companies and national associations from every part of Europe. DIGITALEUROPE wants European businesses and citizens to benefit fully from digital technologies and for Europe to grow, attract and sustain the world's best digital technology companies.

**DIGITALEUROPE** ensures industry participation in the development and implementation of EU policies. DIGITALEUROPE's members include 59 corporate members and 36 national trade associations from across Europe. Our website provides further information on our recent news and activities: <http://www.digitaleurope.org>

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