

ECC and the evolving spectrum policy

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*Conference on spectrum management: perspectives,
challenges and strategies*

Lisbon, 20 September 2013

Who are the spectrum managers?

Global – ITU Radio Regulations : **Treaty between member states**

- To avoid harmful interference to stations operated by other administrations
- ITU-R Recommendations and report = characteristics of equipment and standards (IMT, Broadcasting, maritime), sharing studies ...

‘European’ – ETSI – CEPT/ECC – European Union : **harmonisation and single market**

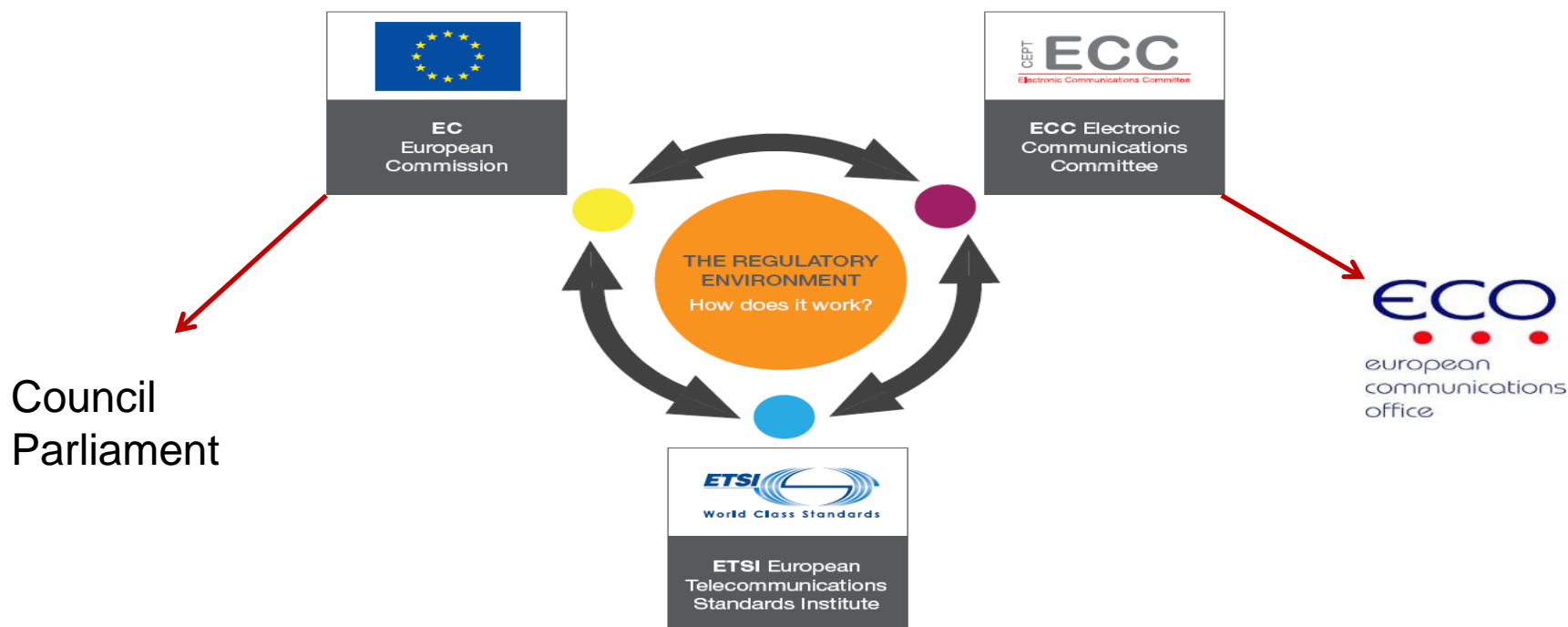
- Harmonised conditions to use spectrum and equipment/system standards;
- CEPT/ECC : designation of spectrum for applications - ‘soft harmonisation’ – in ECC Decision. ECC recommendations/reports provide additional harmonisation measures and technical studies
- EU – binding harmonising regulations in accordance with the EU ”spectrum decision”(676/2002/EC), single market

National frequency regulator (NRA)

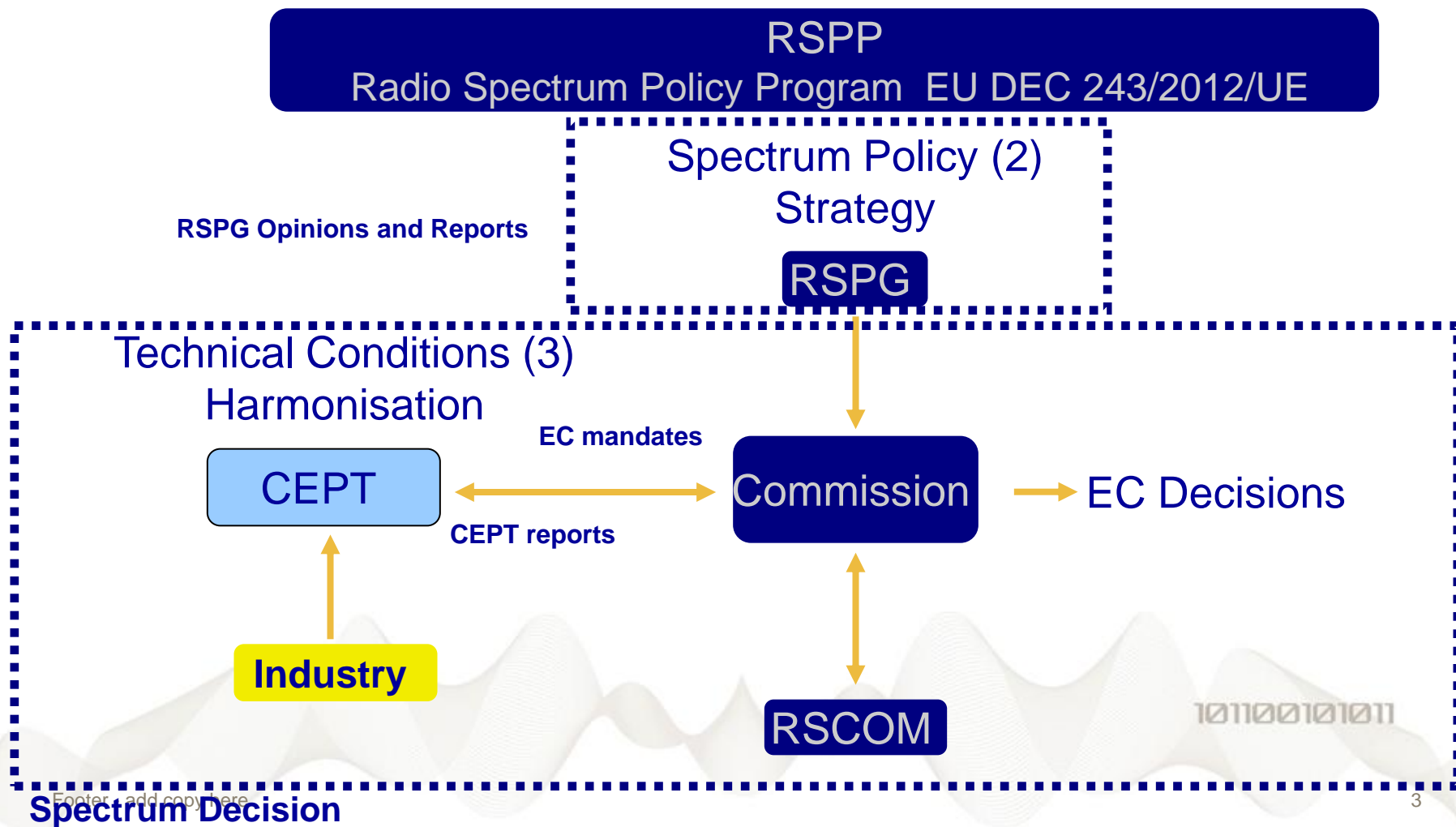
- Issuing authorization including conditions to use spectrum
- Regulation

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Spectrum management in Europe: 3 institutions



Process for harmonising spectrum in EU



ECC Role in Europe

Based on high technical expertise and longstanding experience in spectrum management ECC works on the basis of consensus and its decisions have a voluntary character. It is a flexible instrument in the hands of national administrations

- European Common Allocation Table
- Database on the spectrum use by each CEPT member : www.efis.dk
- ECC Decisions, Recommendations or Reports
- Strong relationship with ETSI and open participation of industry and all stakeholders in the decision making process
- European common positions in international conference (ITU World Radio Conference)
- Holistic approach of spectrum management : all range of spectrum, all services
 - Many applications need access to spectrum, from social alarms to satellite, from mobile networks to military radars : ECC has to manage all requests !
 - Spectrum is a pie to be shared ... but there are many ways to share this pie !

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Key objectives in spectrum management

- *Right balance between regulation and flexibility*
 - Too much regulation may prevent innovation
 - But too “loose” regulation may generate difficult interference case (WiFi 5 GHz to meteo radars, Interference between SRD in the 870 MHz band)
- *”Neutrality”*
 - Technology neutrality : ”Block Edge Masks”? ”minimum technology performance”?
 - Service neutrality: designation to ECS, but characteristics are defining networks/applications
- *Promoting efficient use of spectrum*
 - many regulatory, economic and technical aspects
- *Promoting harmonisation*
 - Europe first, but manufacturers think ”global”

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Need for harmonisation

- Lack of harmonisation means:
 - Equipement cost (economies of scale)
 - Network cost, e.g. one additional duplexer of 1 dB loss = 10 % capacity loss
 - Cross-border coordination difficulties
 - Interference potential
 - Denial of services
 - For Europe, obstacle to the single market

- Every industry claims for Europe/Global harmonisation
 - Broadband
 - Satellite
 - WiFi
 - RFID, SRD ...

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Technology takes care of the lack of harmonisation?

Réseaux
cellulaires et
sans fil

iPhone 5 ©

Modèle A1532 (GSM)* : UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz) ; GSM/EDGE (850, 900, 1800, 1900 MHz) ; LTE (bandes 1, 2, 3, 4, 5, 8, 13, 17, 19, 20, 25)

Modèle A1532 (CDMA)* : CDMA EV-DO Rev. A et Rev. B (800, 1700/2100, 1900, 2100 MHz) ; UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz) ; GSM/EDGE (850, 900, 1800, 1900 MHz) ; LTE (bandes 1, 2, 3, 4, 5, 8, 13, 17, 19, 20, 25)

Modèle A1456* : CDMA EV-DO Rev. A et Rev. B (800, 1700/2100, 1900, 2100 MHz) ; UMTS/HSPA+/DC-HSDPA (850, 900, 1700/2100, 1900, 2100 MHz) ; GSM/EDGE (850, 900, 1800, 1900 MHz) ; LTE (bandes 1, 2, 3, 4, 5, 8, 13, 17, 18, 19, 20, 25, 26)

Modèle A1507* : UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz) ; GSM/EDGE (850, 900, 1800, 1900 MHz) ; LTE (bandes 1, 2, 3, 5, 7, 8, 20)

Modèle A1529* : UMTS/HSPA+/DC-HSDPA (850, 900, 1900, 2100 MHz) ; GSM/EDGE (850, 900, 1800, 1900 MHz) ; FDD-LTE (bandes 1, 2, 3, 5, 7, 8, 20) ; TD-LTE (bandes 38, 39, 40)

Wi-Fi 802.11a/b/g/n (802.11n à 2,4 GHz et 5 GHz)

Technologie sans fil Bluetooth 4.0

Efficient use of spectrum

- There is no absolute metric for evaluating efficient use of spectrum
 - Depending on criteria (turnover, coverage, social benefit ?) and methodology you may tell that broadcasting is more or less efficient than mobile or that terrestrial is more or less efficient than satellite
- Blind measurement of spectrum occupancy leads to false conclusions
 - Sensitivity of measurement is often based on typical mobile reception
 - What could make a frequency "free" is not the absence of measured transmitters, but the absence of close-in receivers
 - GPS band is empty ? Satellite receiving bands are empty ? Passive service bands are empty ?
- But ... *Improving* spectrum efficiency is always an objective
 - Better planning and better technology : FM, Digital TV, 2G/3G/4G, aeronautical
 - Developing sharing solutions
 - Reallocating services in higher bands : Fixed service, 5G ?
 - Regulatory innovations like Licensed Shared Access

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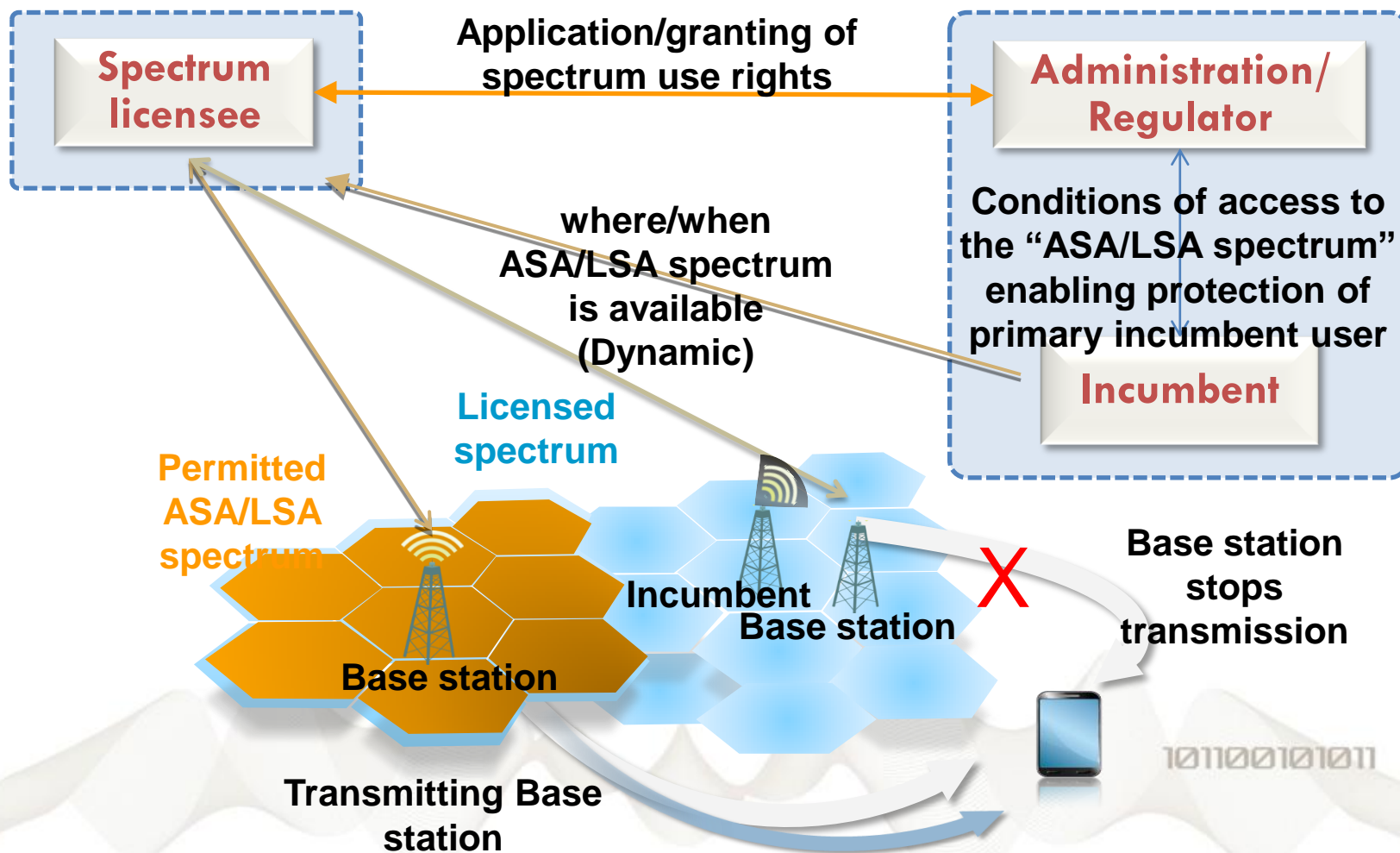
Geolocation + Database sharing solutions

- Powerful idea for sharing between “primary” users and “secondary” users, first envisaged within the “white spaces” of the UHF band
 - If primary users are registered (including ad-hoc registration for PMSE)
 - If secondary users are geolocated and have to get authorisation from a database on which frequency/power/other characteristics they can use
 - ... Then any “white space” could be used on the basis of right algorithms to determine characteristics to transmit without causing interference
- ECC has studied WSD in the UHF band (ECC Report 159) and provided a basis for determining sharing rules
- FCC has recently opened broadcasting “white spaces” and OFCOM will do it in the UHF band (end 2014)
- National administrations are hesitating :
 - Spectrum availability is not so important when taking into account adjacent channel protection
 - UHF band usage is evolving rapidly (700 MHz)
 - Complexity of setting the regulatory and the operational process

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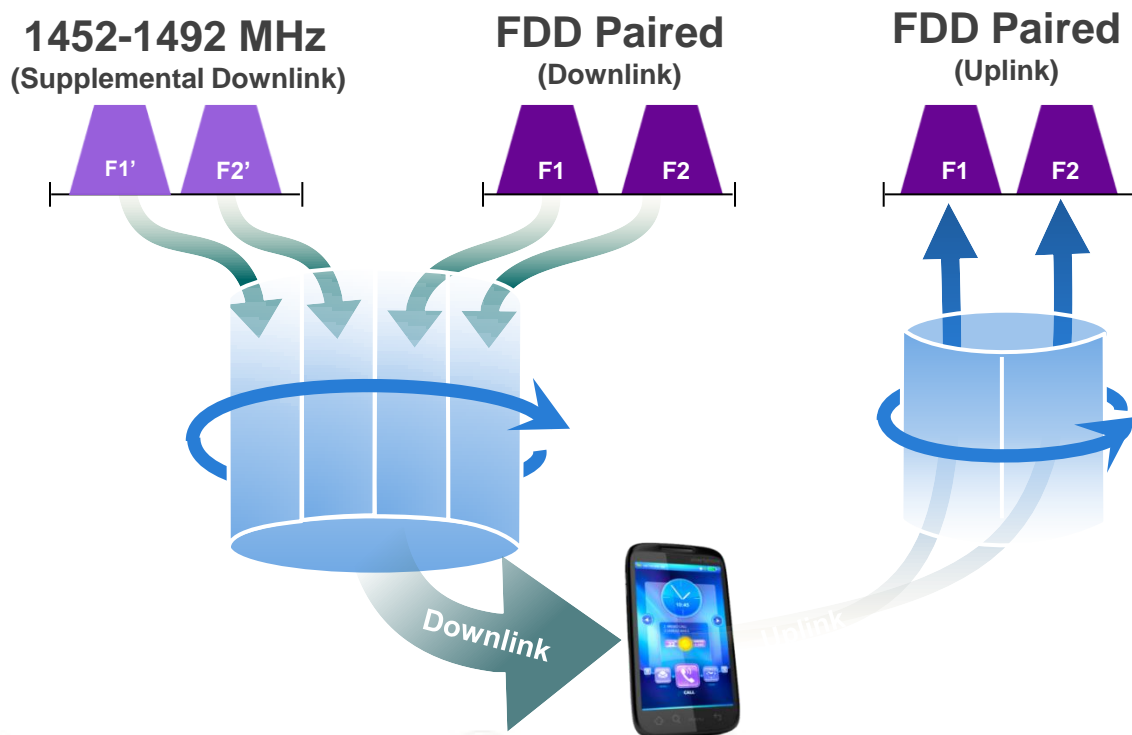
The concept could be used in many other bands, for licensed or unlicensed regime

Licensed Shared Access (2,3 GHz ?)



Supplemental DownLink (SDL)

- 1452-1492 MHz: impact assessment for better harmonisation
- Growing asymmetry in broadband networks
- Technological solution developed in 3GPP and spectrum made available by ECC



New Frequency Bands for Wireless Broadband ?

- 700 MHz band : A second digital dividend
- 5 GHz : additional bands for WiFi (5350-5470 MHz & 5725-5925 MHz) ?
 - Avoiding WiFi becoming the « bottleneck » of broadband access.
Contiguous band (5150-5925 MHz) for wider capacity
 - Compatibility studies with Earth Exploration, Fixed Satellite, Radars, Intelligent Transport Systems ...
- L band (1350-1518 MHz) : Several candidate bands for WRC-15
- 2300-2400 MHz under Licensed Shared Access
- Improving harmonisation in the band 3400-3800 MHz

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Long term UHF vision – what, how and when ?

- Task Group TG6 (Chair Jaime Afonso (POR)) created for taking more strategic and proactive approach to long term for UHF broadcasting band, (focusing on 470-694 MHz)
- Some technical focus but not only:
 - How to best use broadcast (high power/high tower) and mobile dense networks ?
 - Which services for which terminals through which networks ?
 - Cross-border coordination between different networks ? Coexistence possibilities ?
- Produce ECC Report mid-2014 "to identify and analyse possible scenarios for the development of the band in the long term"

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MANY THANKS !

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