

White Spaces and Sharing

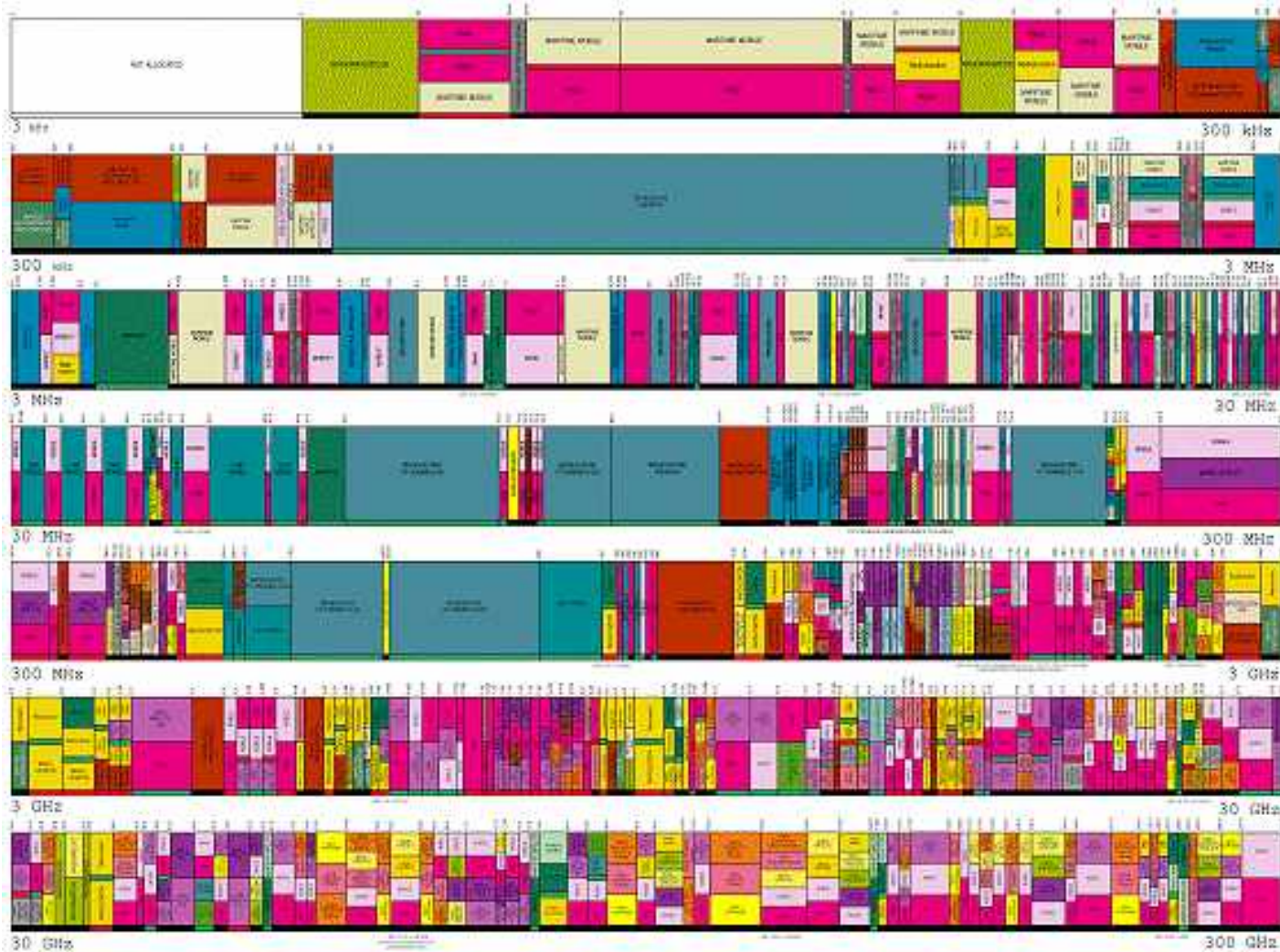
White Spaces, Sharing and the Radio Equipment Directive

We have largely completed our work to enable TV Whitespaces in UK

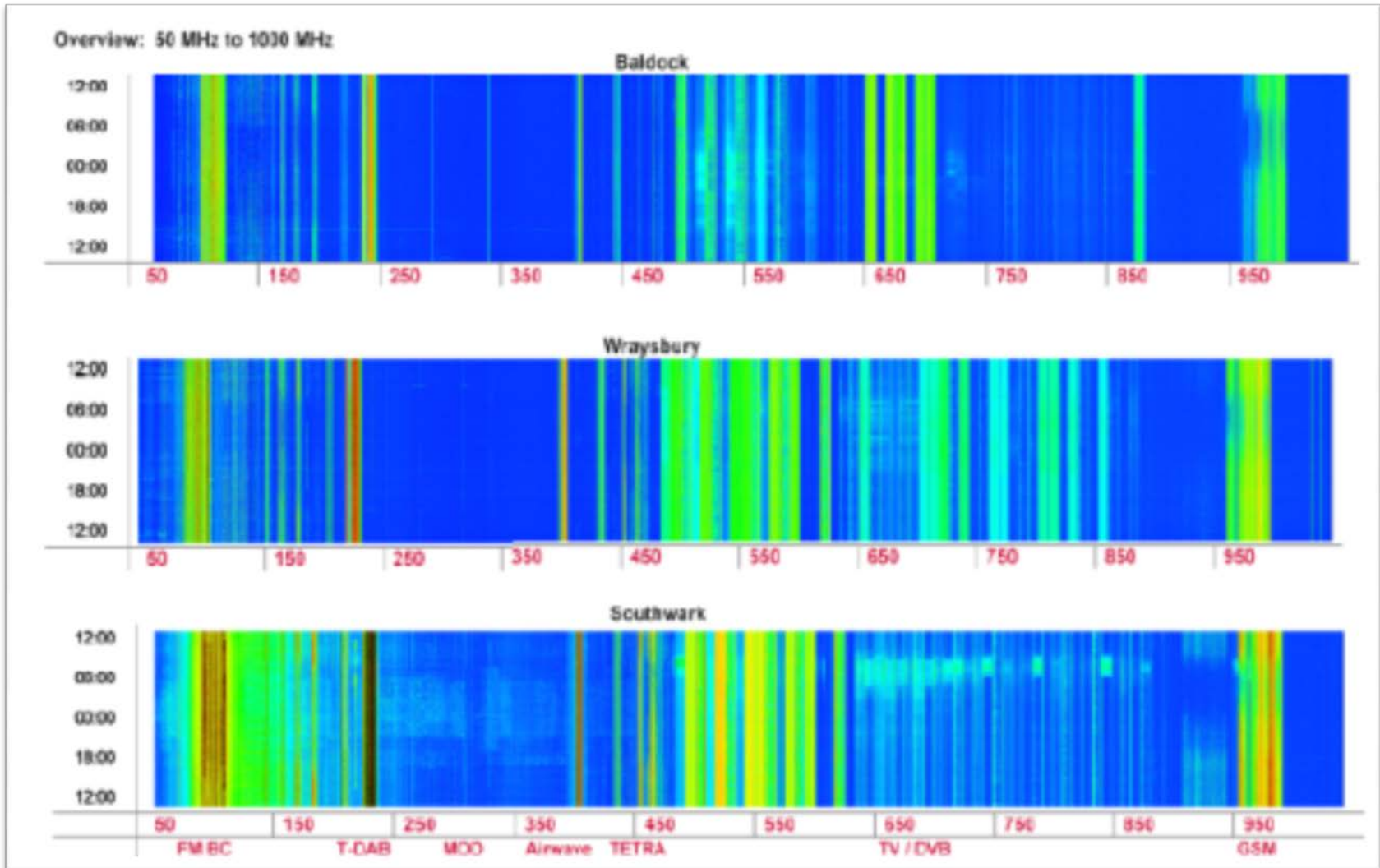
- Statement published February 2015
- Sets out our decision to enable devices to access unused TV spectrum
- Anticipate making Licence Exemption regulations Summer 2015
- Ofcom is a major supporter of RED. We think it is critical to spectrum sharing and efficient use.



Much of the spectrum is allocated and licensed ...



But it is not necessarily all used ...

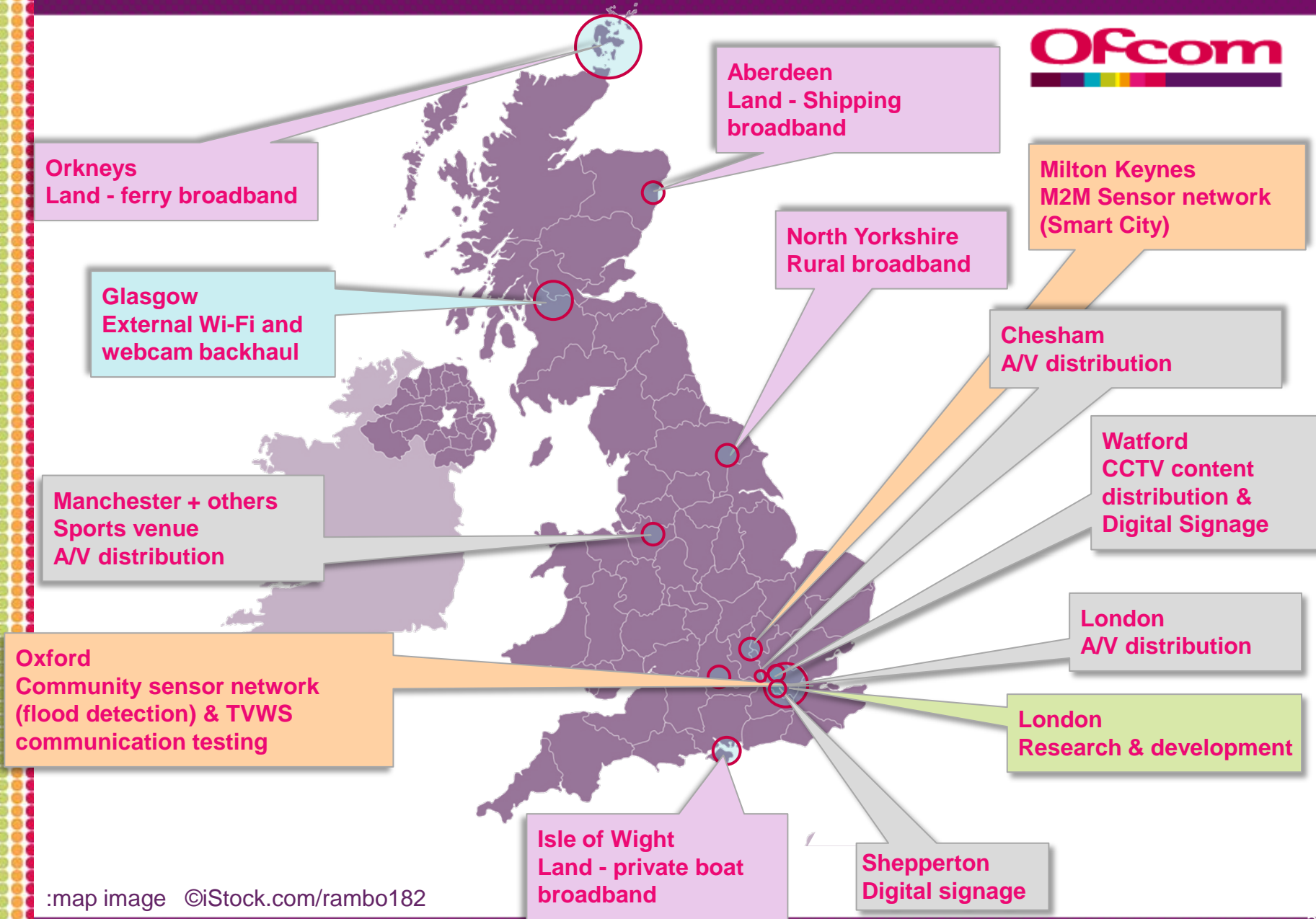


Enabling access to white spaces



- Immediate term
 - We have a **duty** to secure **optimum** use of the spectrum. Spectrum in white spaces is (by definition) **unused**.
 - We have a **duty** to **remove barriers** to innovation.
- Longer term
 - We think **sharing is going to play a bigger and bigger part**, not just in TV bands.
 - Access to TV white spaces is a **stepping stone** for future access to white spaces in **other bands**. This may satisfy some of the huge demand for spectrum for wireless data applications.
 - Enabling technologies are in place. **Regulation and Business Models** appear to be the barrier.
 - Internet, Computing and Radio technologies have advanced to the extent that **dynamic** and **opportunistic** spectrum sharing is **viable**..

TV White Spaces Trials



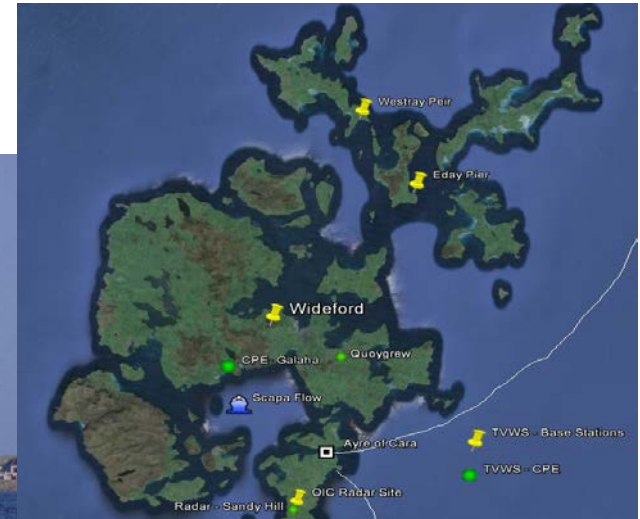
map image ©iStock.com/rambo182

Orkney Islands trial



This trial is using white spaces to provide internet connectivity and communications to ferries travelling between the Orkney Islands and to land locations in the islands

- 4 Base stations
 - 3 land based CPEs, 3 ship mounted CPEs
- Cloudnet has achieved a 30 km link to a ship



London Zoo live video streaming








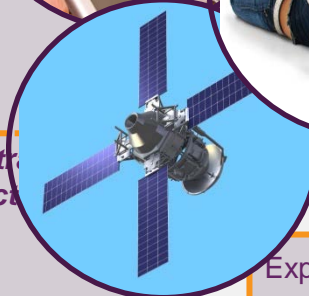





6harmonics Inc.



- A TV white space network to stream live video of the Zoo's meerkats, Asian otters and giant Galapagos tortoises to YouTube.
- One base station and three terminal stations using the 802.11af standard.
- ZSL will test the viability of the technology to monitor and protect endangered animals in the wild.



Ofcom strategy: Enabling White Spaces Access & Sharing

<p>Obi</p>  	<h2>Spectrum Sharing</h2> <p>Optimal use of spectrum requires more efficient use of spectrum will be crucial,</p> <p>There will still be increased pressures on spectrum, especially in concentrated geographical locations</p>	<h2>RF performance</h2> <p>Adopting technology more efficient use of spectrum will be crucial,</p> <p>There will still be increased pressures on spectrum, especially in concentrated geographical locations</p>	  
<p>Str</p> <p>act</p> 	<p>continue to combine the use of market mechanisms possible and effective and regulatory. We will place a growing emphasis on four aspects of how we manage spectrum</p>		
<p>Exploring new forms of spectrum sharing and extending sharing across new bands</p> 	<p>Maintaining our increased focus on understanding the coexistence challenges associated with changes in spectrum use</p>	<p>Promoting improvements in radio performance standards to reduce future coexistence issues</p>	<p>Increasing and quality of information on spectrum use we make available</p> 
<p>Prioriti</p> 	<h2>Managing Coexistence</h2> <p>Implementing strategy for 100 MHz band and considering the</p>	<p>Supporting the Government's Public Sector Spectrum Release (PSSR) Programme</p>	<h2>Spectrum Information</h2> <p>Addressing the challenges around future PMSE spectrum use</p>  

Why is coexistence a priority?

Enable efficient access to radio spectrum

Protect existing users & equipment



Enable access to new services & better sharing

What are we doing?

- **Greater focus on receivers and RF performance**
 - Radio Equipment Directive & more strategic engagement with key bodies
- **Ensure coexistence is well understood & conditions are well set**
 - Improving theoretical analysis where possible e.g. improving UK planning model for DTT
 - Much greater & earlier use of trials where possible e.g. Radars, White Space Devices, Wifi
 - Closer working with key stakeholders on technical issues & trials e.g. BBC, Arqiva, Sky, BT



Coexistence cases Ofcom has faced recently

Ofcom

4G / TV

4G / Radars

4G / Fire Services

4G / Social Alarms

4G / SRDs

4G / WiFi

4G / ALDs

WSD / TV / PMSE



RED is critically important to Ofcom

- Key changes in RED essential requirements
 - Use the spectrum efficiently – Receive as well as Transmit
 - Spectrum is an increasingly crowded place – take account in radio design
- We think this is essential
 - We run into coexistence issues frequently when enabling access to spectrum
 - Without high quality devices, there is less WS and sharing opportunities
- Ofcom has made sharing and robust radio devices a key part of our spectrum strategy for this reason.
- We see benefit in standardisation as a key enabler in spectrum sharing & efficient access

RED – what Ofcom is trying to achieve

- We see RED as a significant opportunity to ensure robust & efficient devices.
- We are putting much resource into it.
- We will be engaging with other NRAs & stakeholders as necessary to ensure standards are appropriate.
- We are taking a prioritised approach to our engagement
 - Facilitating and sponsoring new work items where necessary
 - Engaging in some standards discussions
 - Ensuring standards meet the essential requirements of the directive

RED – Some key priority areas for Ofcom



	High Priority Engagement
	Broadcast Receivers - DTT Receivers and Amplifiers
	Aeronautical Primary Surveillance Radar
	2.4GHz Wi-Fi, Bluetooth and Zig Bee

	Medium Priority Engagement
	5 GHz Wi-Fi
	5 GHz Metrological Radar
	Audio Short Range Devices
	Mobile Satellite Service (MSS) and Very Small Aperture Terminals (VSAT)
	Non-Specific short range devices

- Ofcom is sponsoring new work items:
 - TV Receivers
 - TV Aerial amplifiers
 - Primary Surveillance Radars
 - Metrological Radar

Thank you

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Questions