Dynamic Spectrum Alliance

RRS 14-AMERICAS

Tobago July 18 , 2014

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About the Alliance

- The Dynamic Spectrum Alliance is a global organization advocating for laws and regulations that will lead to more efficient and effective spectrum utilization.

- Our members are working to create innovative solutions that will increase the amount of available spectrum to the benefit of consumers and businesses alike.

- http://www.dynamicspectrumalliance.org

Dynamic Spectrum Alliance Goals

- Close the Digital Divide
  - Support technical, regulatory, and business model innovations that make wireless broadband access more affordable for people around the world
- Enabling the Internet of Things
  - Support spectrum policies that can enable the burgeoning Internet of Things
  - Increasing efficiency and improving quality of life
- Alleviating the “Spectrum Crunch”
  - Support changing regulatory policies that create artificial spectrum scarcity
  - Replace them with policies that will increase available bandwidth, reduce costs, and increase consumer choice

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Current Members

6Harmonics
ADAPTRUM
Aviacomm
Botswana Innovation Hub
Broadband Center of Excellence
Canadian Spectrum Policy Research
臺灣大學電信研究中心 Communication Research Center, NTU
COSTECH
CSIR our future through science
CTVR the telecommunications research centre
Gigabit Libraries Network
Google
Institute for Infocomm Research A*STAR
財團法人資訊工業策進會 Institute for Information Industry
InterDigital
MBC Mid-Atlantic Broadband Communities Corporation
MediaTek
Microsoft
my digital bridge
WaveTek
NICT National Institute of Information and Communications Technology
NSRC Network Startup Resource Center
Panaftel Wireless Always ON...
RelayServices
sky
SpectraLink Wireless
University of Strathclyde USA Foundation
SSC
TENET Tertiary Education and Research Network of South Africa
Texas Instruments
Toyota InfoTechnology Center Co., Ltd.
uhuruone
University of Colorado Boulder | Colorado Springs | Denver | Anschutz Medical Campus
The University of York

Summit sponsors and hosts

Co-Host

WiFi provided by

SpectraLink Wireless

Sponsors

Google™

MEDIATEK

Microsoft

DYNAMIC ALLIANCE

Africa:
30,301,596 sq km

Other Named Counties:
29,843,826 sq km

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DSA Global Summit Day 1 Recap

- TVWS Technology moving from prototypes to commercial stage
  - Evidence: Adaptrum & 6Harmonics on 2nd generation equipment
  - Aviacom radio is an ASIC
- Standards: WiFi (802.11af) is embracing TVWS
  - Evidence: MediaTek a Tier 1 World Leader has embraced 802.11af with end of year target

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Aviacomm

Aviacomm TVWS Projects

NICT – TVWS Field Trials in Japan and Ofcom have plans to use Aviacomm RFIC

- Qualified Aviacomm's ARF3010 TVWS transceiver
- Systems and Baseband supplied by leading companies

Japan(other) – TVWS projects using Aviacomm RFIC Transceiver

- a new TVWS application have been defined

Microsoft – TVWS Field Trial with Ofcom in the UK uses Aviacomm RFIC Transceiver

- System & Baseband supplied by 6Harmonics & MediaTek

Google – TVWS Field Trial with Ofcom in UK uses Aviacomm RFIC Transceiver

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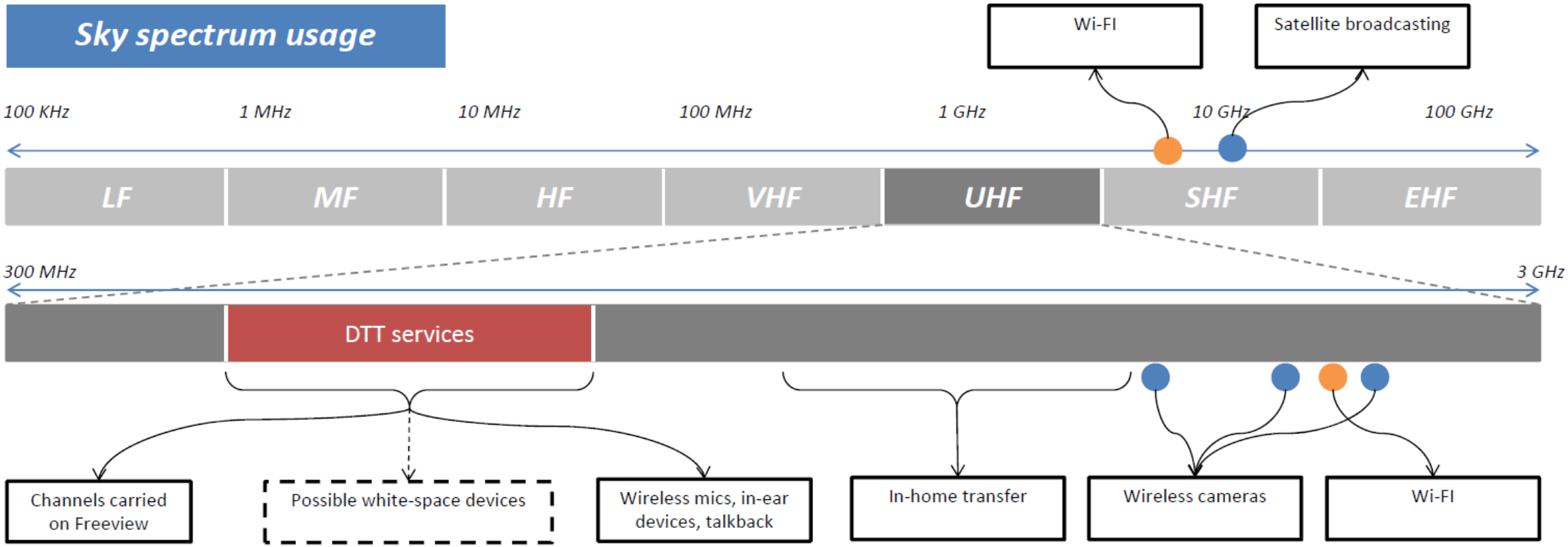
Usage: Sky is a heavy spectrum user across a range of activities & frequencies

We use spectrum to create our content, deliver our services and connect our customers

Sky spectrum usage



*Sky content is also delivered by third parties across their own distribution networks which may use spectrum (e.g. use of Sky Go via LTE on mobile)

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From Policy/Regulations to Commercialisation of all Radio Technologies

- Regulations and policy have to be clear
- Standards need to be agreed upon – e.g. how to devices “talk” to databases; or WiFi extension
- Chipsets, base-stations and devices, etc. will need to be developed
- Radios developed in volume
- Then value chain must be populated by competing players
- Viable business models need to be developed
- Happy shareholders are sustained

DSA Value Chain

DSA Value-Chain and Technology Requirements

- Regulators around the world are currently setting rules and requirements that will allow for mass-market access to white spaces.
- DSA is also a powerful next generation mobile communications technology.

World-Wide

DSA Chip sets /Module	Service Provider ex:Geo DB	DSA BS /Platform/SI	DSA Access Deviece	Testing/RD Center	DSA Operator
•Aviacomm •MediaTek •Adaptrum •Neul	•Microsoft •Spectrum Bridge •Telcordia •Google	•Power Automation, Singapore •6Harmonics •Carlson Wireless •Ruckus Wireless •DoubleRadius •Wavetek •White Space Technologies	•Power Automation, Singapore •Carlson Wireless •Terrabit Networks	•Centre for White Space, UK •CSIR, Africa •I²R, Singapore •NSRC, US •NICT, Japan	•BSkyB •Indigo Telecom •StarHub •UhuruOne

Singapore Regulatory Approval

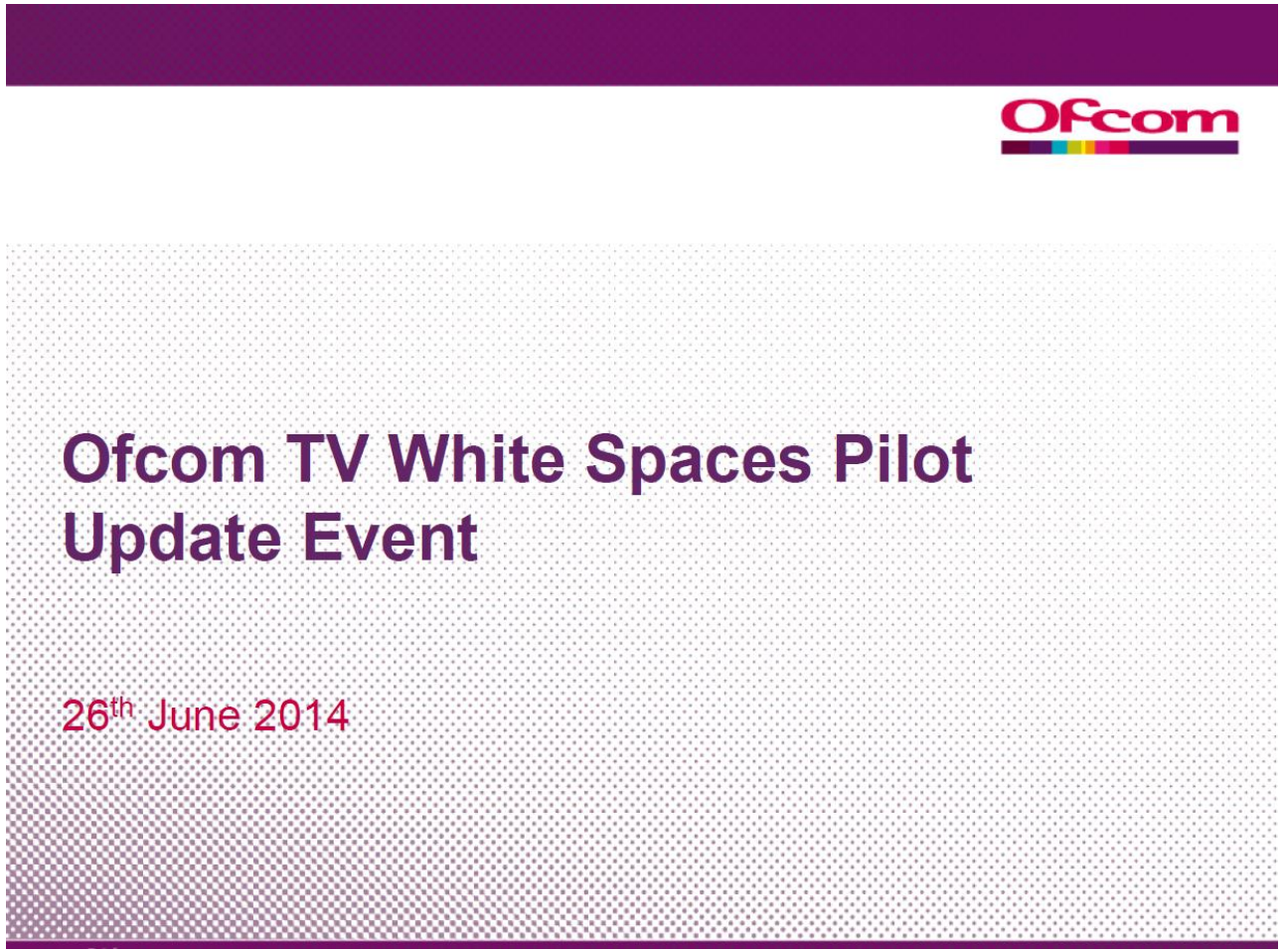
NEWS RELEASE
EMBARGOED TILL 16 JUNE 2014, 1930 HRS

Singapore Gains a Super-sized Wireless Innovation Band with Regulatory Approval of TV White Spaces

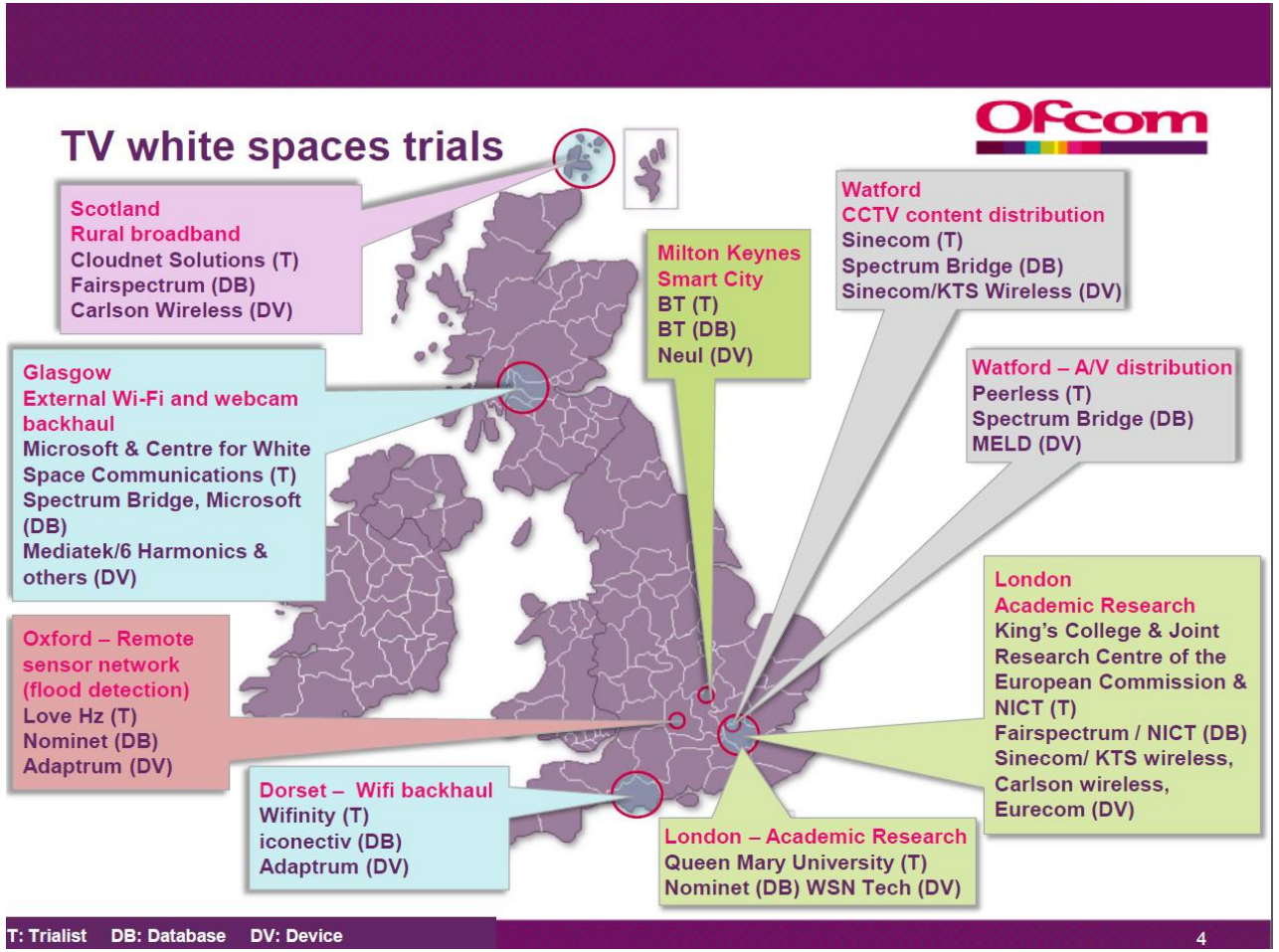
180 MHz of spectrum made available to drive TVWS commercialization and propel Singapore's Smart Nation vision

Singapore — 17 June 2014 — The Singapore White Spaces Pilot Group (SWSPG), an industry consortium representing 18 public and private sector members, supports and applauds IDA on its announcement of a regulatory framework for unlicensed access to unused TV broadcast frequency bands, or TV White Spaces (TVWS). Spectrum bands open for unlicensed access, such as the popular Wi-Fi bands, are often referred to as "innovation bands" since they have low barrier of entry and foster innovation. The new IDA regulation, taking effect in November 2014, will make available an estimated 180 MHz of spectrum for unlicensed TVWS operation.

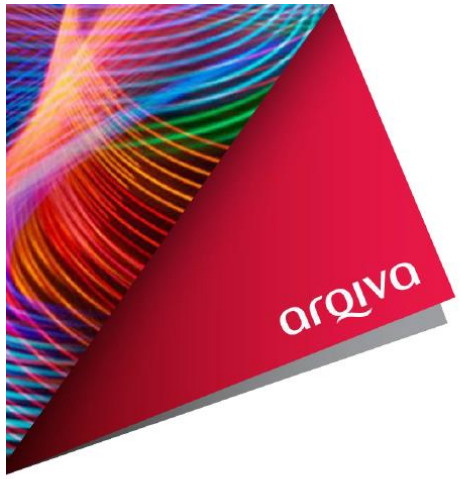
Ofcom Pilot



Ofcom Pilot Trials



Ofcom:Protecting Broadcast



BBC

Ofcom WSD Workshop
Update on white space device testing at the Building Research Establishment

Phil Brown, Mark Waddell, Dave Darlington, Phil Kesby

26th June 2014

Company confidential

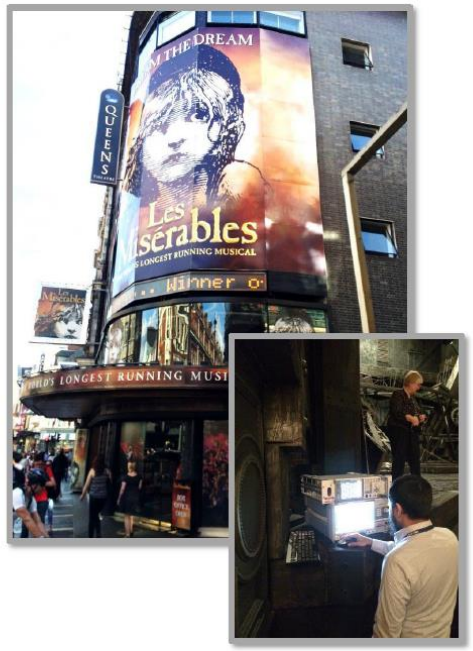
106

arqiva

Ofcom: Protecting PMSE

Queens Theatre

- Uses 40 radio microphones on 5 DTT channels and expected 'intermodulation' to be the challenging aspect.
- The first tests were completed in the venue with no cast present.
  - Measured the radio environment
  - Road tested our objective listening test equipment.
  - Introduced WSD emissions on co channel and 1,2,3,5,7,11 adjacent channels
- Following stakeholder discussions, more tests were carried out with the full cast.
  - Monitor and record radio metrics and cast audio



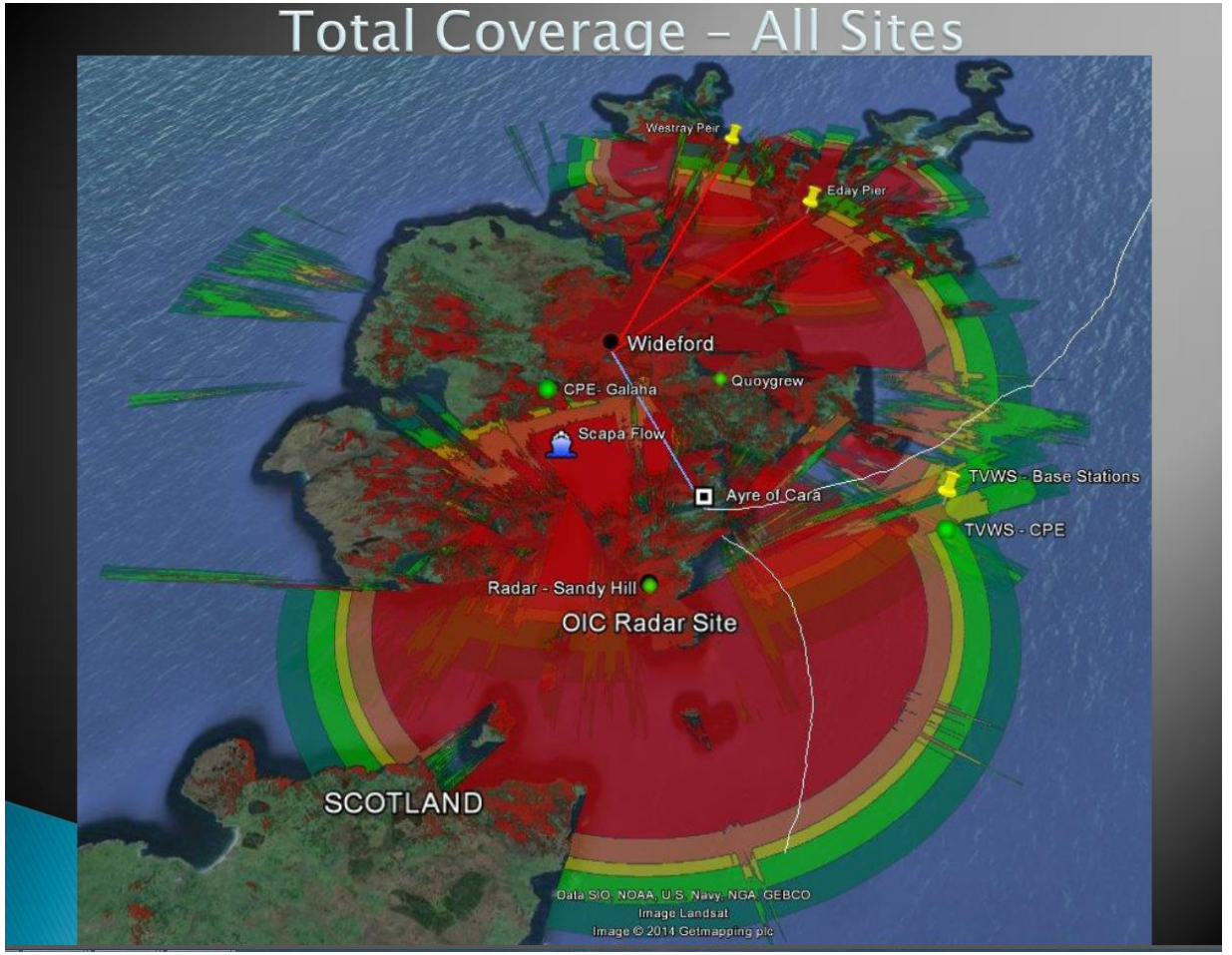
Glasgow Pilot aims/objectives

- Assist Ofcom to complete the enabling TVWS regulations
- Showcase wireless and sensor technology expertise in Scotland

Centre for White Space Communications

Image: CENSIS (Innovation Centre for Sensor and Imaging Systems)

OFCOM:Island Applications



Ofcom:Island Coverage

Spirit of Marconi
Ilse Of Wight Lifeboat

Ofcom Pilot Databases

Pilot Databases

- Databases control the operation of devices and are the key innovation in the TVWS framework
- Databases operation is regulated by Ofcom and a contract has been put in place to do this
- 9 companies have signed a contract for the pilot
- Spectrum Bridge, Fairspectrum, NICT and Nominet having successfully passed the qualification process and their databases are now discoverable by devices
- BT, iconectiv, Microsoft, Sony are going through the qualification process
- Qualification involves self-declaration against specific technical requirements; off-line tests and; simulated online tests

Ofcom Pilot: Devices

What Regulators to do to get there

1. Attend DSA events
2. Learn more about Dynamic Spectrum Access – join or follow DSA
3. Regulatory: ITU WRC 2012 concluded that the current international regulatory framework can accommodate dynamic spectrum access without any changes – so in the hands of national regulators
    - Awareness
    - Proactivity on accessibility and affordability issues
    - Understand & weigh the arguments
    - Legislation and/or regulations in the hands of regulators
- Cf. Ethernet and WiFi took 10 years from policy to commercialisation

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Call to Action

- **In the 2020s, Dynamic Spectrum Access should start being the norm, rather than the exception as is today**
- **The Americas and Emerging Economies need Dynamic Spectrum Access .. And they can *confidently* lead a la M-Pesa, rather than just follow**
- **It is good for the Regulator/Government; for Network Economics, for Competition/Industry; for Entrepreneurs**
- **And even better, it can happen, it must happen – via collaboration**
- **A Caribbean saying reinforces the point: "***One hand wash the other, together dey wash the face* " So much more is achieved by co-operation.