Ensuring the world has the spectrum it needs

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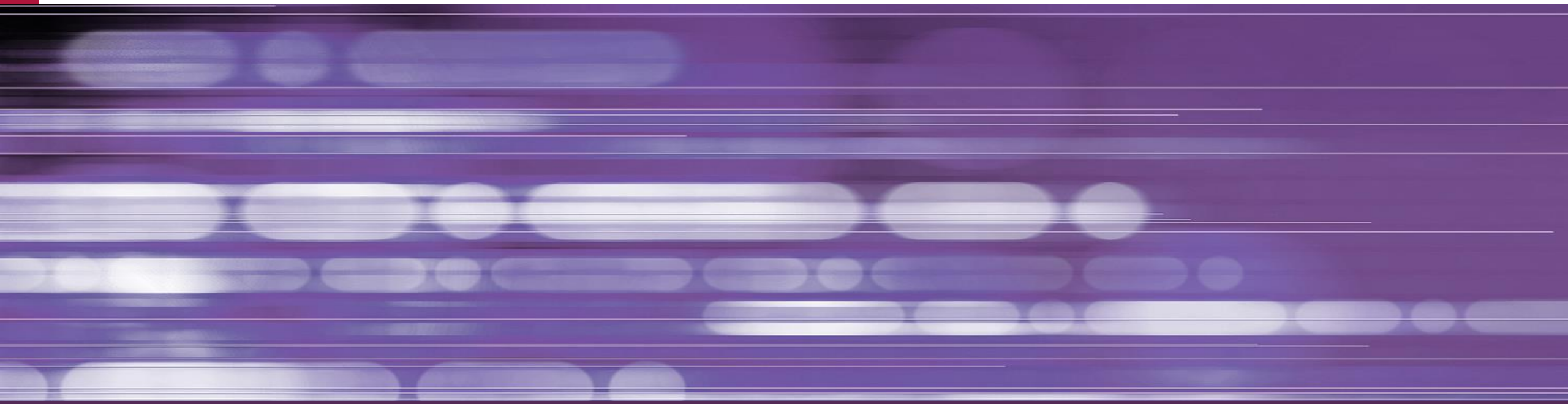
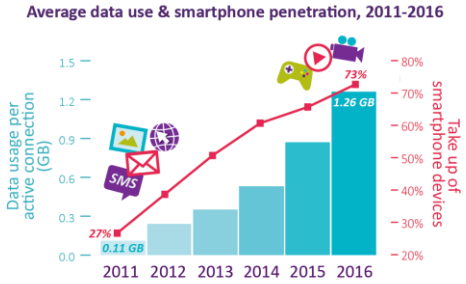


Today

- Mobile growth is key driver of change



- Harmonisation is tight and seen as critical

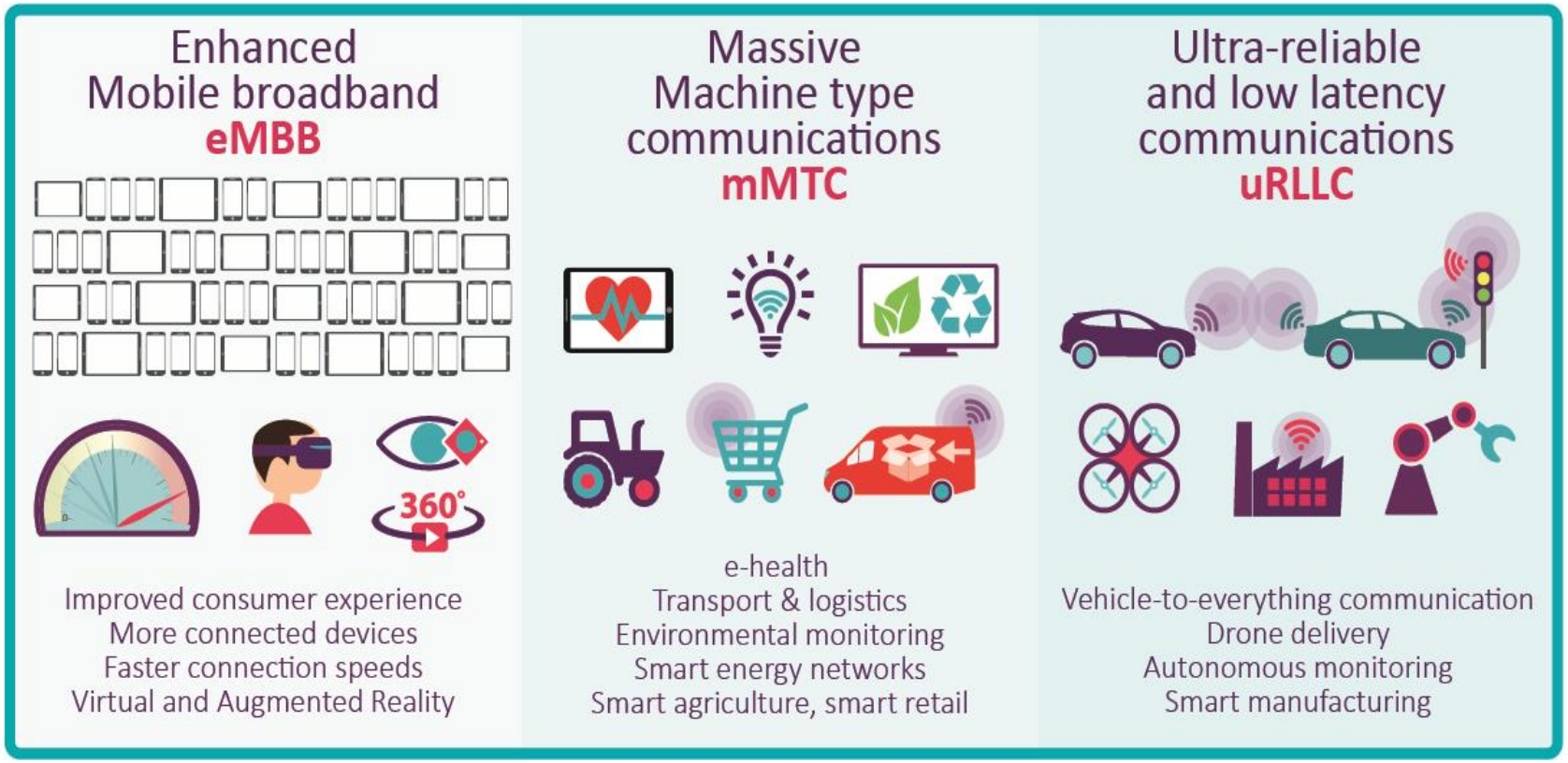
- Large ‘coordinated’ Clearance Programmes drive spectrum availability

- Protection is key

.. An approach of '*NO, YOU CAN'T*' ..

..Instead of, '*let's see how to make it WORK*'.

5G will enable different use cases across a broad range of industry sectors

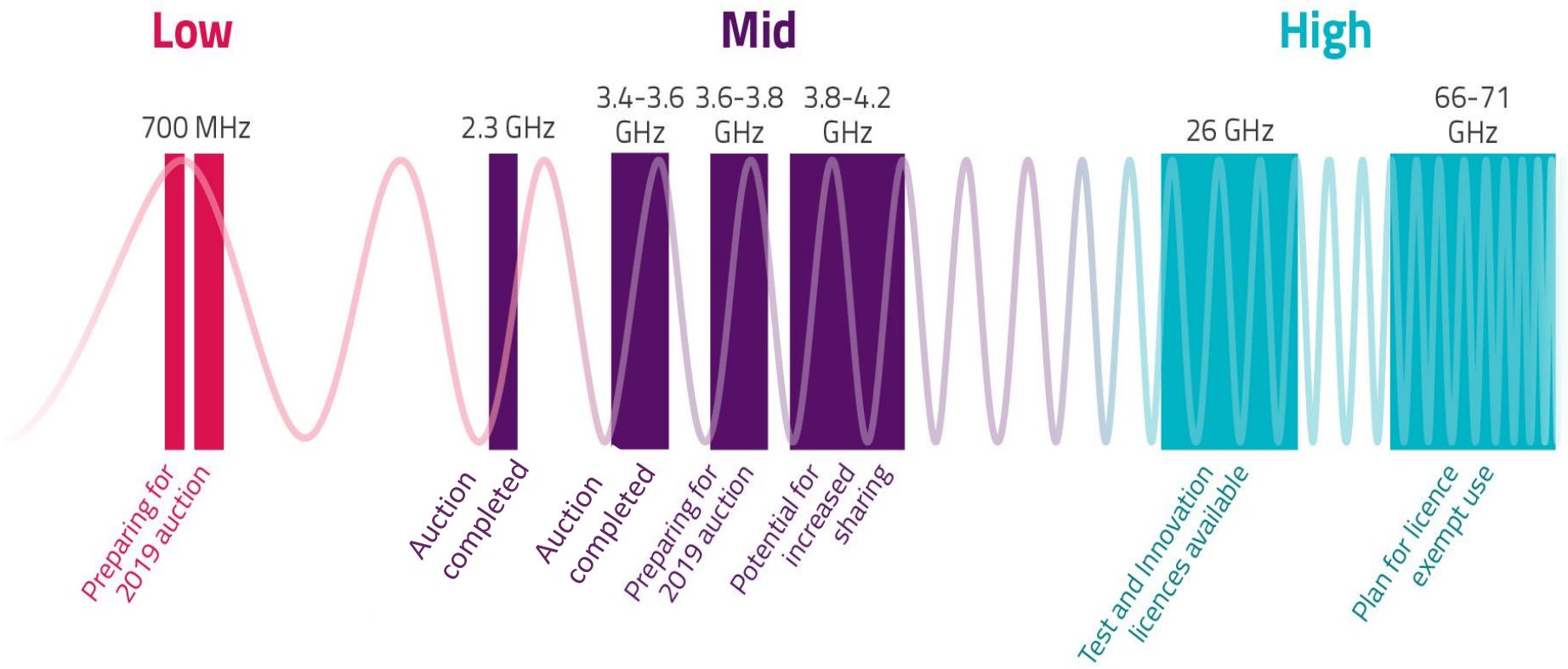


But we need to CHANGE..

- Mobile still a key driver but the 5G World is not the traditional mobile of the last 30 years
  - Industrial high capacity applications (verticals)
  - IoT for both consumers and industrial solutions
  - Transport (autonomous and connected cars)

Will this all be enabled by MNOs?

Our objective: making sure spectrum is not an inhibitor of 5G



But different authorisation methods needed

Low and mid range spectrum for 5G: clearance and award

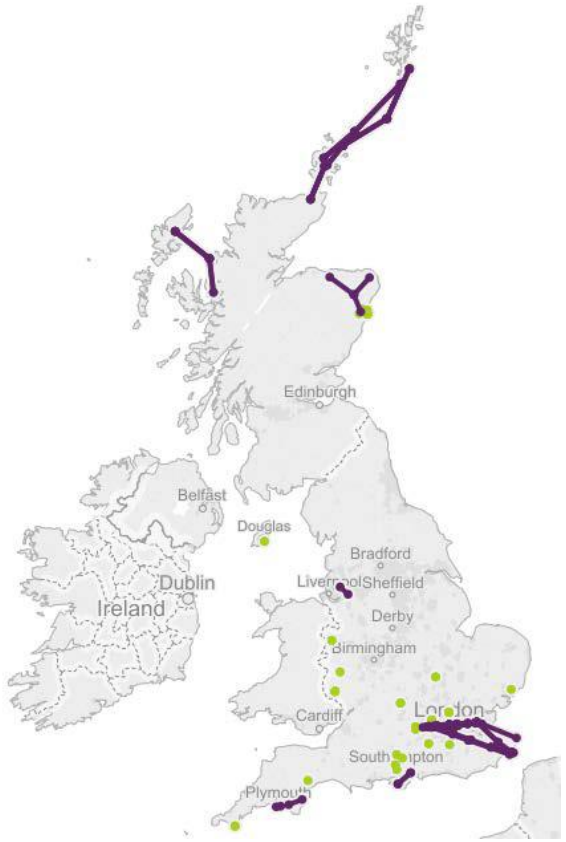
700 MHz

- Provide wide area coverage
- Clearance well under way
- **Award in 2019**

3.4-3.8 GHz – “primary” band for 5G

- Large bandwidth can support higher data rates, provide increased capacity, and enable higher speeds
- **3.4-3.6 GHz - awarded**
- **Intention to award 3.6-3.8 GHz in 2019**

Potential for shared access to stimulate innovation in mid range and mmwave spectrum



3.8-4.2 GHz

- Exploring the potential for further sharing between existing and innovative new uses
- Enhanced sharing based on geographically defined authorisations

mmWave

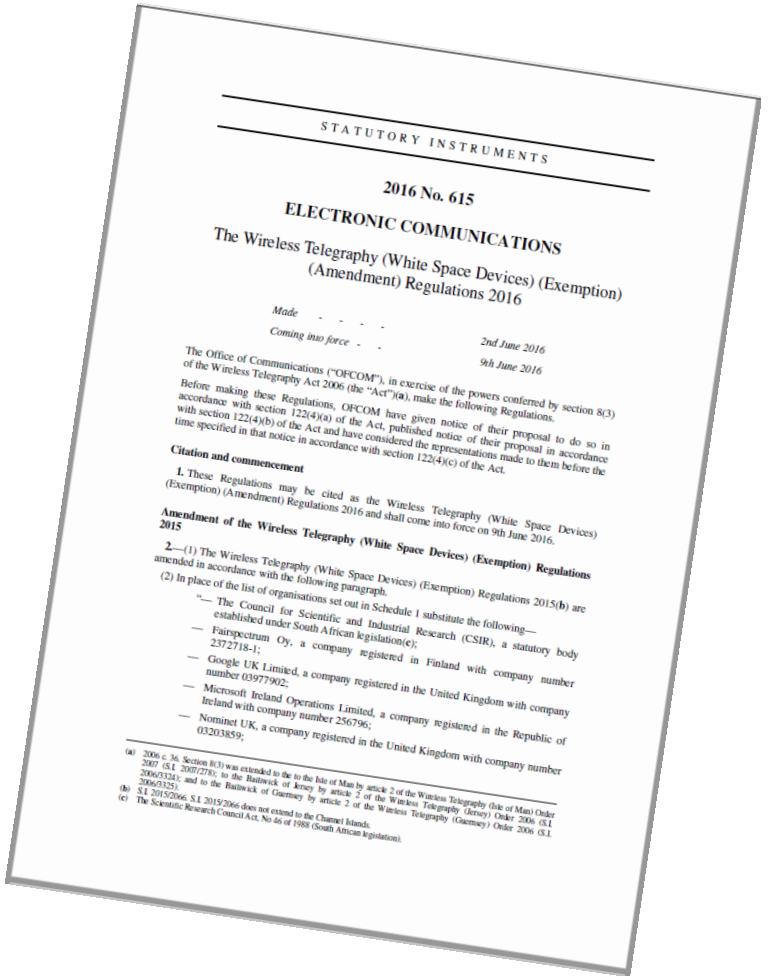
- Explore potential for shared use in the bottom of the **26 GHz** band. Is it possible to develop enterprise network infrastructure?

Our roadmap for 5G mmWave spectrum

- **26 GHz**: Trial and Innovation licences available.
- **66-71 GHz**: We are working to make this band available on licence exempt basis for 5G
- **40 GHz**: Support internationally as part of wider band for harmonisation of equipment (37-43.5 GHz)

Sharing managed using databases is one of our spectrum authorisation approaches

- TV White Spaces is operational in the UHF band in the UK
- Dynamic shared access tools could be applied in other bands, **where appropriate to achieve our objectives**



STATUTORY INSTRUMENTS

2016 No. 615

ELECTRONIC COMMUNICATIONS

The Wireless Telegraphy (White Space Devices) (Exemption) (Amendment) Regulations 2016

Made - - - - *2nd June 2016*

Coming into force - - *9th June 2016*

The Office of Communications ("OFCOM"), in exercise of the powers conferred by section 8(3) of the Wireless Telegraphy Act 2006 (the "Act")(a), make the following Regulations.

Before making these Regulations, OFCOM have given notice of their proposal to do so in accordance with section 122(4)(a) of the Act, published notice of their proposal in accordance with section 122(4)(b) of the Act and have considered the representations made to them before the time specified in that notice in accordance with section 122(4)(c) of the Act.

Citation and commencement

1. These Regulations may be cited as the Wireless Telegraphy (White Space Devices) (Exemption) (Amendment) Regulations 2016 and shall come into force on 9th June 2016.

Amendment of the Wireless Telegraphy (White Space Devices) (Exemption) Regulations 2015

2.—(1) The Wireless Telegraphy (White Space Devices) (Exemption) Regulations 2015(b) are amended in accordance with the following paragraph.

(2) In place of the list of organisations set out in Schedule 1 substitute the following—

"— The Council for Scientific and Industrial Research (CSIR), a statutory body established under South African legislation(c);

— Fairspectrum Oy, a company registered in Finland with company number 2372718-1;

— Google UK Limited, a company registered in the United Kingdom with company number 03977902;

— Microsoft Ireland Operations Limited, a company registered in the Republic of Ireland with company number 256796;

— Nominet UK, a company registered in the United Kingdom with company number 03203859;

(a) 2006 c. 36. Section 8(3) was extended to the to the Isle of Man by article 2 of the Wireless Telegraphy (Isle of Man) Order 2007 (S.I. 2007/2778); to the Bailiwick of Jersey by article 2 of the Wireless Telegraphy (Jersey) Order 2006 (S.I. 2006/3324); and to the Bailiwick of Guernsey by article 2 of the Wireless Telegraphy (Guernsey) Order 2006 (S.I. 2006/3325).

(b) S.I. 2015/2066. S.I. 2015/2066 does not extend to the Channel Islands.

(c) The Scientific Research Council Act, No 46 of 1988 (South African legislation).