

Spectrum Policy Forum Cluster 1 – Meeting on 5G

Summary on 5G key points

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The SPF steering board agreed that Cluster 1 should gather key points from the 5G discussions to date, into a publishable paper

- The workshop held on 17 May 2016 identified a range of key issues regarding implementation of 5G, developments in 5G technologies and frequency bands, which the steering board has asked Cluster 1 to summarise into a publishable paper
- Today's discussions will highlight further issues in relation to the high frequency bands under study for 5G internationally
- The intention of the 5G paper is to summarise SPF's views on 5G in a form that:
 - can be shared with UK policy makers directly involved in influencing 5G developments
 - will publicise the industry's views on the key issues that will make 5G a success in the UK
 - proposes relevant UK-led actions where needed, in order to address the key success factors for 5G
- Analysys Mason has been tasked with authoring the paper by capturing discussions from both the above-mentioned workshop and today's meeting
- In the remainder of this presentation we:
 - summarise the key points captured from the Cluster 1 meeting held in May 2016
 - consider how these key points might be best illustrated in a published paper
 - identify the key success factors that have been discussed to date
 - propose UK-specific actions for further discussion and agreement following today's meeting

The Cluster 1 meeting held in May 2016 focussed on how 5G might emerge in the market place, and on the key challenges and factors for its success

Draft summary of issues emerging from the Cluster 1 workshop on 5G held in May 2016

UK mobile landscape

- The UK mobile market is mature and highly competitive, with four mobile operators and numerous mobile virtual network operators (MVNOs)
- Mobile penetration has reached saturation, but 4G take-up has been rapid
- There is strong growth in mobile data traffic but overall mobile revenues are declining

Likely deployment scenarios

- 5G will bring a new virtualised architecture supporting many small cells
- 5G will complement, not replace, 4G
- 5G will result in interworking between technologies (LTE-A, LAA, Wi-Fi, 5G new radio)

What will 5G bring?

- New mobile experiences – e.g. near-instant access to multi-media and entertainment services, mobile cloud services, virtual reality mobile video streaming, connected cars
- Device-to-device applications
- Will support essential UK services – e.g. smart cities, healthcare and other public services

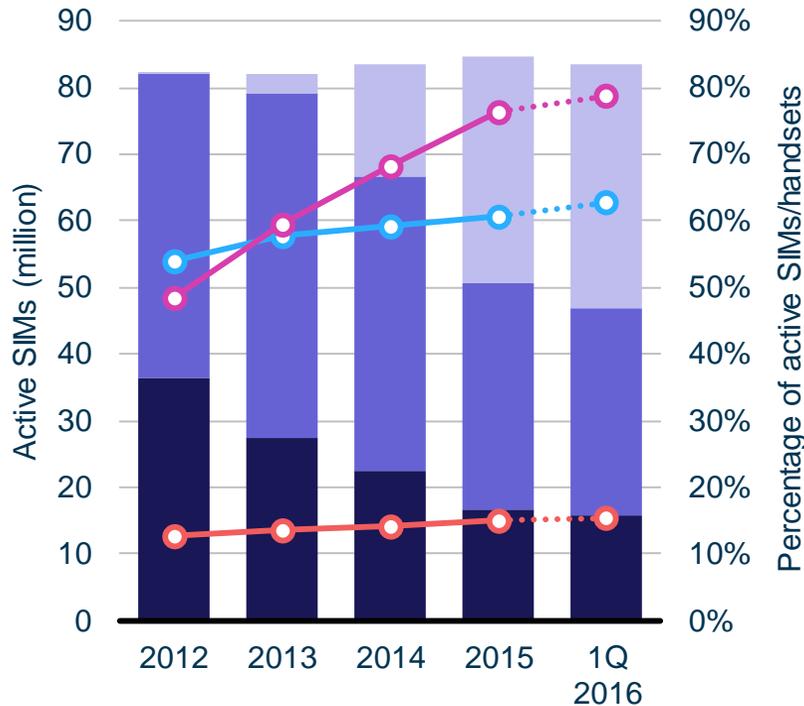
What will make 5G a success?

- Suitable spectrum – in low- and high-frequency bands
- Access to sites – 5G needs many more antennas
- Millimeter-wave bands needed to provide significantly higher data rates
- New spectrum regimes, i.e. a combination of unlicensed and licensed spectrum

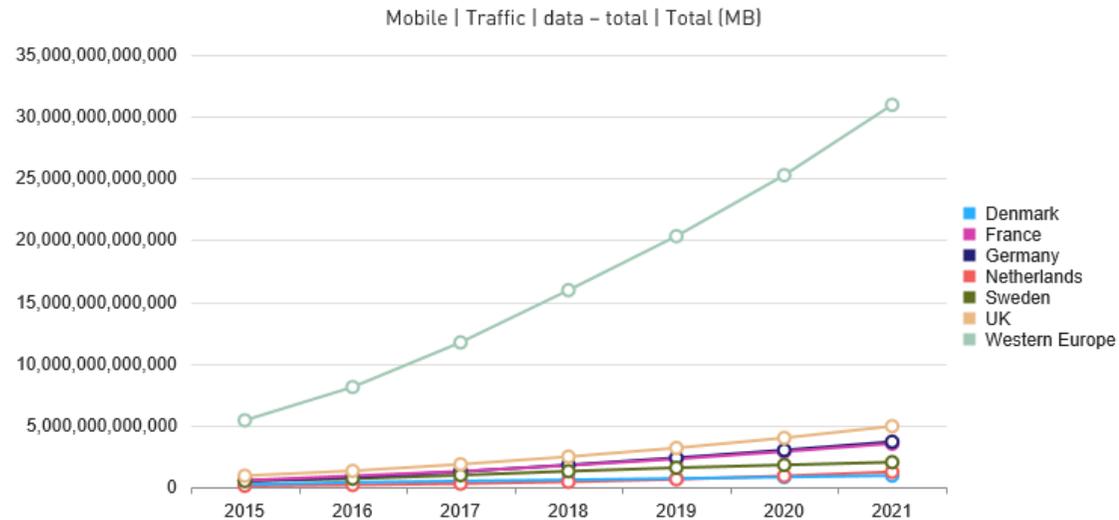
Are there any other key points that should be highlighted which are missing from this summary?

The UK mobile market is mature and highly competitive, with high 4G penetration and increasing mobile data traffic

Evolution of 4G penetration and smartphone adoption in the UK



Growth in mobile data traffic in selected European countries, and average for Western Europe



Active SIMs: 2G 3G 4G

Penetration: Contract Smartphone MVNO

5G is poised to bring new mobile experiences to consumers, and to provide near-instant mobile connections to a range of vertical industries

New mobile experiences for consumers



- Virtual reality mobile video streaming
- Always-available mobile cloud services
- Near-instant access to entertainment
- Wireless TV
- In-car infotainment

'Internet of Things'



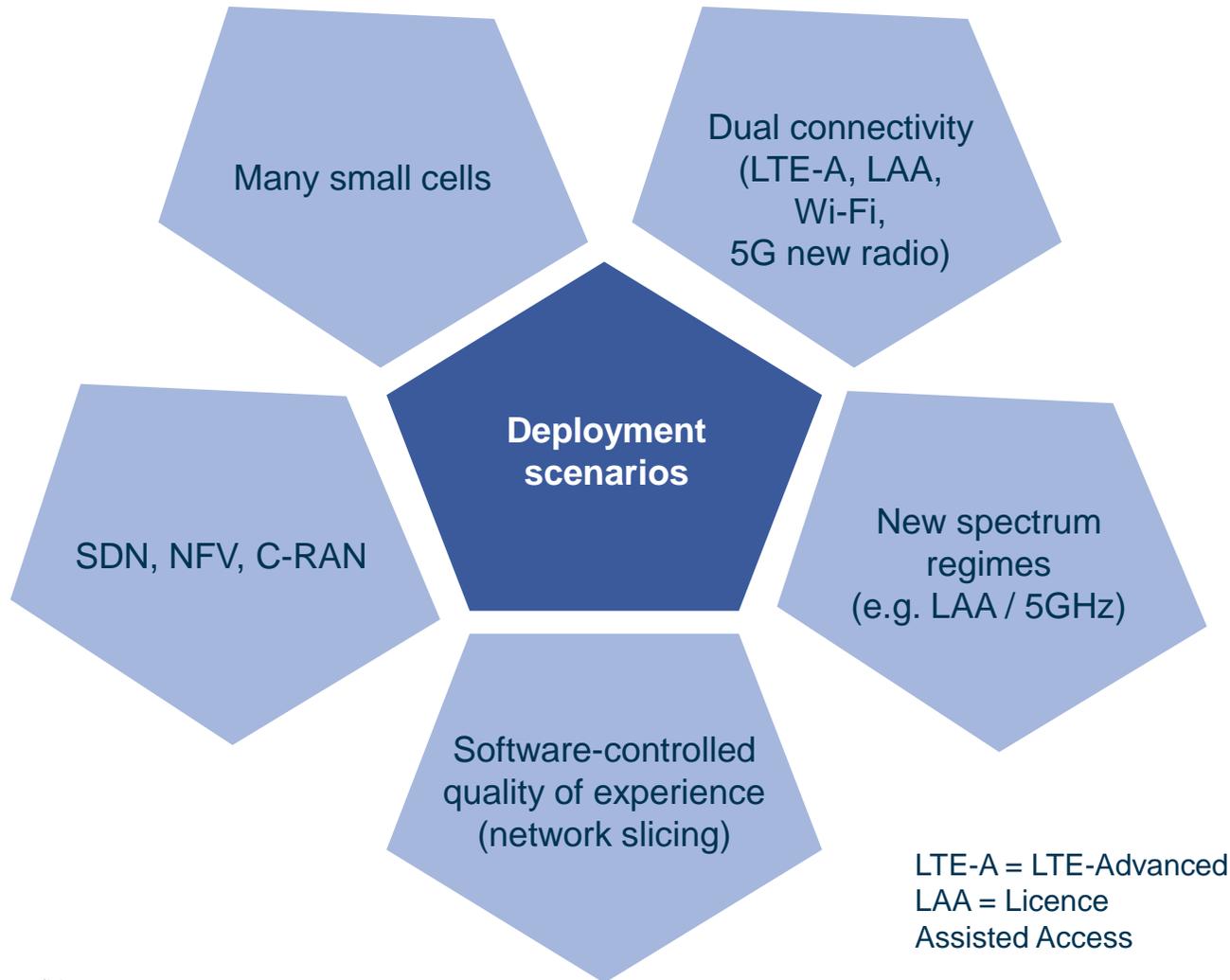
- 'Massive machine-type' communication across smart cities, within connected homes, in cars, along transport routes, within industrial sites, etc.

Near-instant mobile connections for a range of vertical industries



- Depending on coverage and deployment scenarios, 5G has the potential to provide near-instant mobile connectivity for a range of 'critical' industries – e.g. healthcare, automotive, transport and public safety

5G will potentially bring virtualised networks supporting many small cells, but there is a technology-cost balance to operator deployments



Key success factors include having access to suitable spectrum and sites, and managing the diverse range of 5G device and service scenarios

Issue	Requirement	Proposed UK actions
1 Spectrum	<ul style="list-style-type: none"> Low- and high-frequency spectrum needed New spectrum regimes will evolve (i.e. LTE-A, LAA, Wi-Fi, 5G-NR) Millimetre wave bands required to enable significantly higher data rates 	<ul style="list-style-type: none"> New licensed bands needed in time for 5G (e.g. 700MHz, 3.4–3.8 / 3.8–4.2GHz) Regulatory support needed for new forms of spectrum access (e.g. LAA) Global harmonisation on mm-wave bands needed to achieve economies of scale
2 Access to sites	<ul style="list-style-type: none"> Backward compatibility with 4G needed (i.e. macro-sites still needed) Many new small cells potentially required Will require large bandwidth for backhaul 	<ul style="list-style-type: none"> Reform of the Electronic Communications Code to be followed through and implemented Ensure that sufficient wireless backhaul capacity can be available
3 Managing complex device-service mix	<ul style="list-style-type: none"> An increase in the number of connected devices and connected industries will result in a complex mix of devices and services that needs to be better understood and managed in the context of UK market priorities 	<ul style="list-style-type: none"> Understanding of new business models could be achieved through 5G demos and test-beds: appropriate spectrum needed to support suitable demos and trials undertaken in the UK

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