Comments on Ofcom's shared access licensing framework

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Ofcom’s shared access licensing is a good framework

- Our preferred options for enablement of 4G/5G local networks:

1) Use the capacity of large scale public mobile networks (slicing);
2) Lease spectrum from MNOs (Ofcom’s local access licensing);
3) Locally licensed spectrum (Ofcom’s shared access licensing);

- Overall, we consider that Ofcom’s shared access licensing (**SAL**) at 3.8-4.2 GHz is a helpful regulatory framework:

  - Single tier of local licences – avoids complexities of multi-tier frameworks.
  - First-come first-served local licensing – avoids uncertainties of DSA schemes.
  - Low licence fees – cover Ofcom’s administrative costs only.

- **Caveat**: Was 400 MHz too much? Our recommendation (in 2019) was that Ofcom assigns only a portion of 3.8-4.2 GHz for local licensing. More on this later.

Take-up of shared access licences – as expected?

- **Observation –** Number of SALs issued at 3.8-4.2 GHz (as of 24-09-2021):

  - 71 low-power SALs issued to 23 licensees.
  - 192 medium-power SALs issued to 13 licensees.

  There is clearly some demand.
  We had expected numbers of similar order.

- But some stakeholders argue that take-up is low. Would be helpful to perform research to uncover any obstacles to take-up. We consider it unlikely that any obstacles relate to the SAL framework itself. If there are any obstacles, these are more likely because businesses

  - are not aware that they might benefit from 4G/5G local networks?
  - are aware of potential benefits, but are uncertain about investment?
  - might prefer a slice of 4G/5G public networks?

Let's not forget the needs of macro-cellular networks!

- We are encouraged by Ofcom's statements in its recently published "spectrum management strategy for the 2020s" in acknowledging the importance of both local and national licences:

> *3.47 Local access can suit a range of businesses and specialised services at sites like factories, airports and remote farms, which do not need to use spectrum across the whole UK. We will continue to make spectrum available through larger, including national, licences which can support wide coverage for public mobile services.*

Source: Ofcom 2021

and by Ofcom's recognition of emerging new use cases which will require wider area networks:

Changing application demands	***Smart city & industrial Internet of Things (IoT)** will develop with diverse communication requirements…*
	***Robotics and drone** usage might become increasingly common…*
	***Connected vehicles** are a reality. There will be more vehicle-to-everything communication…*

Source: Ofcom 2021

Assigning large swathes of mid-bands for low/medium-power short range communications can have a huge opportunity cost.

There is a need for a roadmap for wide-area/nationally licensed mid-bands spectrum to address the needs of macro-cellular IMT 5G NR networks and their evolution.

Recommendations (1/3)

- Ofcom's shared access licensing (SAL) is a helpful regulatory framework:
  Low-cost, single-tier, first-come-first-served local licensing
  are all aligned with the needs of IMT 4G/5G users,
  and avoid the uncertainties of dynamic/opportunistic spectrum access.

  We currently see no need for any changes to the SAL regulatory framework.

- Ofcom should continue its excellent efforts to increase the awareness
  of businesses regarding SALs.

  It would be helpful for Ofcom to regularly update industry on the number
  and nature of the issued shared access licences and local access licences.

Recommendations (2/3)

- Mid-bands are extremely versatile, and are essential for economically viable high-capacity wider area mobile/coverage across cities for eMBB and vertical use cases.

  For this reason, assigning large swathes of frequency for local licensing can have a huge opportunity cost – especially at mid-bands. We recommend regulators undertake cost/benefit analysis (including careful assessment of verticals' spectrum needs) before assigning additional mid-bands spectrum for local licensing.

- Local licensing of low-power equipment should not be seen as an opportunity to avoid efforts to assign new bands for use by high-power macro-cellular networks for the growth of IMT 5G NR and its evolution – especially when the latter demands sophisticated inter-service spectrum sharing studies.

- The importance of CEPT harmonized technical conditions and their benefits in terms of economies of scale cannot be over-emphasised.

Recommendations (3/3)

- Spectrum sharing is tightly linked to interference management. We are encouraged by Ofcom's statements in its recently published "spectrum management strategy for the 2020s" in relation to spectrum sharing:

> ***Promoting spectrum sharing:*** *Encouraging users to share access to spectrum with others. […] We will encourage:*
>
> - *Use of better data and more sophisticated analysis when assessing the conditions for sharing;*
> - *Wireless systems to be more resilient to interference from their neighbours;*
> - *An efficient balance between the level of interference protection given to one service and flexibility for others to transmit.*

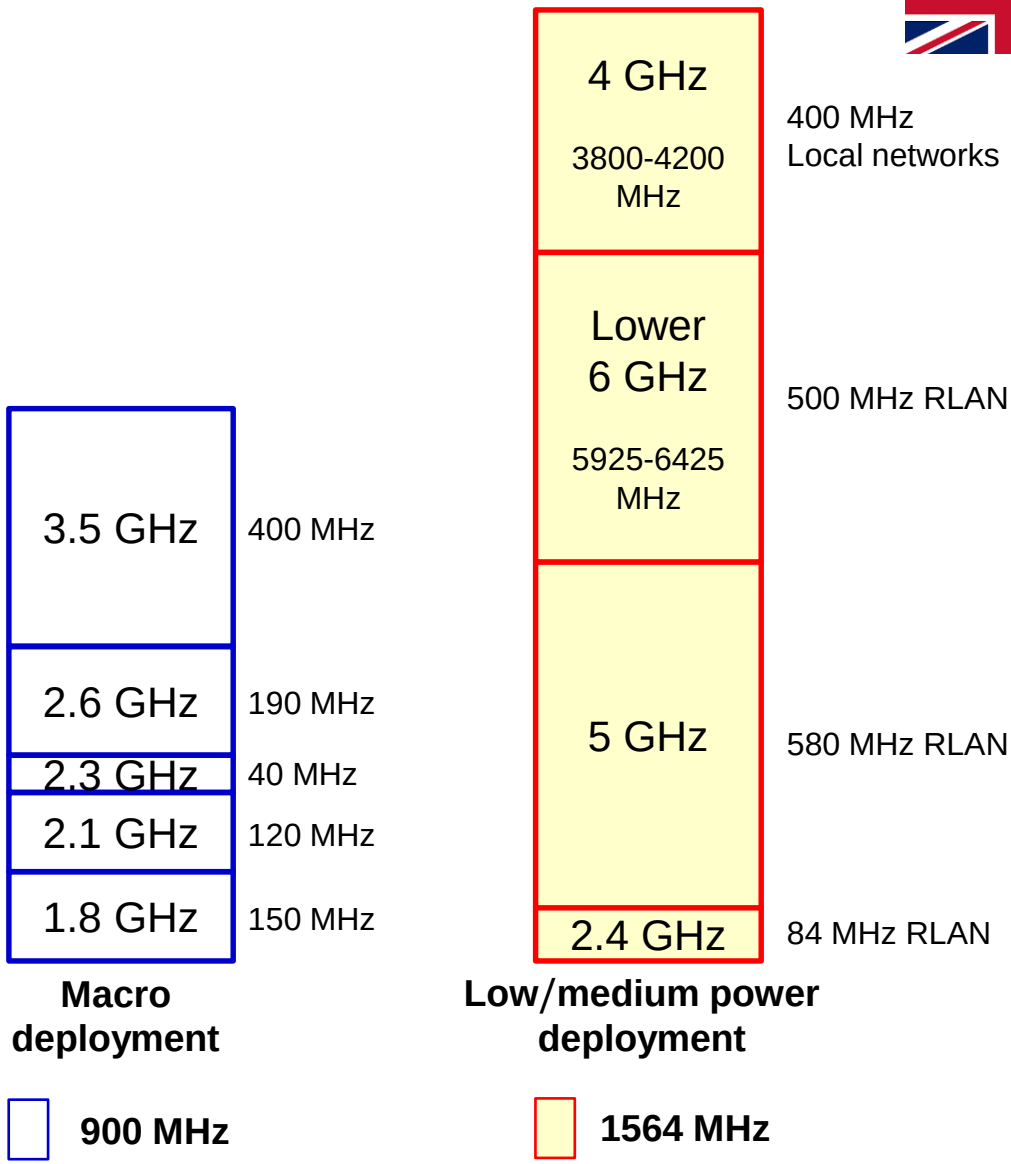
Source: Ofcom 2021

We recommend that Ofcom supports activities with the aim of improving the quality of radio propagation models, and their use in regulatory organisations to develop least restrictive technical conditions for efficient spectrum sharing.

Annex

How much mid-bands spectrum for low/medium-power deployments?

- Low/medium power deployments – whether IMT based local networks or RLANs – do not need as much mid-bands bandwidth as wider-area mobile networks:
  - Smaller coverage area implies lower traffic and bandwidth demand per cell.
  - Low range means lower power allowing reuse of the same spectrum across local networks with sufficient isolation.
- Local networks for industrial use cases with high performance requirements need 5G NR (few use cases can benefit from RLAN equipment).
- mmWave high bands also play a role for low/medium power networks.



Assigning large swathes of mid-bands for low/medium-power short range communications can have a huge opportunity cost.