Your response

Question	Your response
Question 1. How do you think demand for Shared Access is likely to change in future and why; Which use cases do you think are likely to emerge or grow, and which decline? Please provide a view on the bandwidth you would consider the minimum and optimal requirement for growth use cases, and timelines you would expect for their development	*Is this response confidential? – N (delete as appropriate)* We are of the view that demand for shared access to spectrum for 5G and other network technologies will continue to grow. DECT and DECT NR+ as a 5G technology have been designed with flexibility in mind to support different use cases, e.g. consumer, professional and industrial audio-, video-, intercom and IoT applications. Channel bandwidth options ranging from smallest channel bandwidth aligned with classic DECT, i.e. 1.728 MHz up to 6.912 MHz in the DECT band but with wider bandwidths in 5G bands.
Question 2. Are there elements of the current framework that complicate the use of Shared Access licences for specific use cases? If so, please provide specific examples and indicate the changes that would be required to facilitate this and how this might co-exist with other use cases.	*Is this response confidential? – N (delete as appropriate)* DECT NR+ has a different approach to connectivity than other 5G technologies. Specifically, DECT NR+ does not employ the classic 'base station-mobile station' architecture. Each radio device in the network can act as a Radio Device Fixed Termination Point (RD_{FT}) or a Radio Device Portable Termination Point (RD_{PT}). In some network topologies, for example in mesh networks, the mode of the radio device may change autonomously depending on the context of the communication. As the current licence conditions for the shared access bands are based on a classical architecture with a base station and associated mobile or terminal, it is not clear how DECT NR+ can be authorised for novel use cases, and DECT Forum would welcome the opportunity to discuss this issue and DECT NR+ directly with Ofcom.

Question 3. Do you have any comments on the power restrictions currently in place, particularly in urban/high density areas, under the Shared Access licence? Please explain what benefits could be delivered using a higher operating power (e.g. medium power in urban areas), or any concerns you sharing with such operations).	*Is this response confidential? – N (delete as appropriate)* The current power restrictions in place are sufficient for DECT NR+.
Question 4. Do you have any comments on the exceptions process, and how some of its benefits could be maintained within more standardised and automated assessments?	*Is this response confidential? – N (delete as appropriate)*
Question 5. Do you have any views whether and how the coordination approach should be modified? If yes, please provide comments in light of the issues set out above.	*Is this response confidential? – N (delete as appropriate)* The availability of the 3.8-4.2 GHz band, and the potential for its harmonisation, is a key candidate band for technologies such as DECT NR+. An important issue is that although the technical licence conditions are supposedly 'technology neutral' they have been derived from 3GPP 5G technology, so conditions such as a requirement to align and synchronise frame structures makes access to spectrum 'technology specific'. This is contrary to the principle of technical neutrality, and Ofcom should be mindful whether such licence conditions unfairly give an advantage to one technology over another.
Question 6. Do you have views on whether newer or emerging technologies can support coexistence between additional users in the band, and if so, how?	*Is this response confidential? – N (delete as appropriate)* DECT NR+ is an emerging 5G radio technology which can satisfy the connectivity requirements of many different users. Initially envisioned to operate within the licence exempt 1.9 GHz band, it has been specifically designed to operate in a shared spectrum environment. Higher layers are designed to support efficient spectrum use by having an advanced coexistence capability thanks to optimized physical and MAC layer design. As this is technology neutral, the values for spurious emissions etc. should be defined in an objective way to ensure that the bands long-term sustainability is guaranteed.
Question 7. Please outline any comments on the current licensing process (e.g. ease of	*Is this response confidential? – N (delete as appropriate)*

application, time taken, the information we require). If relevant, please note aspects you are currently content with and areas which could be improved.	Generally, the more automated the process, the better. For high density use at large events such as Olympic Games, FIFA World Cup etc. there should however be some kind of manual monitoring and intervention possible to support frequency coordination.
Question 8. Do you have any comments on the suitability of available spectrum for your use cases? Please consider the relevance of the additional bands we are proposing for the framework, and the impact of any limitations on existing bands.	*Is this response confidential? – N (delete as appropriate)* The availability of the 3.8-4.2 GHz band, and the potential for its harmonisation, is a key candidate band for technologies such as DECT NR+. An important issue is that although the technical licence conditions are supposedly 'technology neutral' they have been derived from 3GPP 5G technology, so conditions such as a requirement to align and synchronise frame structures makes access to spectrum 'technology specific'. When making additional bands available for shared access in future, Ofcom should be mindful whether licence conditions unfairly give an advantage to one technology over another. Today DECT and in the future DECT NR+ are important technologies for the support of audio and video intercom for small to large events. Currently the 1880-1900 MHz band is not enough spectrum for many of these use cases typically 100 MHz is required for the needs of the event organisation, Blue Light Services, security and team communications.
Question 9. Do you have any comments on equipment availability limiting deployment options in 3.8-4.2 GHz? Please comment on the impact of any experiences you have had, and where relevant, your expectations for when more equipment will be broadly available across the band.	*Is this response confidential? – N (delete as appropriate)* The availability of the equipment is dependent on spectrum availability. As the regulation conditions and terms are set the service and equipment requirements can be set. We see no technology impediment to adapting current designs to the targetted band and power limits, initially with band shifting circuitry and later with integrated radios.
Question 10. Do you have any other general comments on the Shared Access framework? Please consider any areas where future innovations could further support Ofcom's	*Is this response confidential? – N (delete as appropriate)* Shared spectrum operation and regulation should enable also service scenarios of overlapping systems based on spectrum licensors needs. Such use may become relevant

policy objectives for this spectrum, and/or improve the experience for users.	e.g. in industry or hospital environments where multiple service providers may operate on the same premises.

DECT Forum response to Ofcom's call for input on "Evolution of the shared access licence framework"

About DECT Forum

DECT is a globally adopted short-range wireless technology, with key attributes such as security, reliability and openness to a wide range of residential and professional applications. The overall mission of the DECT Forum is to support a collaborative environment of the DECT industry and drive programs to develop and improve DECT wireless technology to exceed wireless communications expectations and meet the needs of a technology-shifting world.

To address the industry needs, the DECT Forum initiates and drives all the necessary activities to ensure a growth of the DECT market, the technology and related products and applications.

Introduction to DECT NR+

DECT NR+ is known as DECT-2020 NR within ETSI and as DECT 5G-SRIT in the IMT-2020 recommendation ITU-R M.2510-1, which broadly encompasses fifth generation terrestrial communication technologies. It is designed for local network operation supporting various types of deployment scenarios from point-to-point connections to star and mesh topologies. The medium access control protocol (MAC) is designed to support shared spectrum operation with both contention-based and scheduled access procedures.

The technology can support Ultra-Reliable and Low Latency Communications (URLLC) operation with scheduled access mode enabling periodic data transmissions, and Massive IoT or Massive Machine Type Communications (mMTC) deployments with mesh operation supporting high device densities or wider coverage area depending on service. In its extended form DECT NR+ can be deployed over a large industrial area or even city-wide deployment in a smart city application for example.

DECT NR+ devices are referred to as Fixed Termination point (FT) or Portable Termination point (PT). In a point-to-point configuration the radio connection between two or more radio devices is enabled by one device operating in FT mode and initiates radio resource coordination and beacon transmissions. Other devices perform association procedures in PT mode with the FT.

DECT NR+ can also be configured as a mesh network. This can support very high device densities and the autonomous routing decisions in each device provides the ability to adapt dynamically for mobile users in the system as well as varying interference conditions.

Devices can communicate directly with each other, or via devices in the network to extend the range. In this configuration the mode of the radio device can autonomously change between FT and PT depending on the context of the communication, with devices taking 'local' decisions on allocation of the radio resource i.e. no central coordination is needed.

Consequently, DECT NR+ does not conform to the typical view of a Base Station and a Mobile Terminal (or user equipment).

DECT NR+ network topologies

Wireless Point-to-Point and Point-to-Multipoint Links

Wireless Point-to-Point links involve two radio devices communicating with each other. The radio connection between radio devices (RD) is enabled by one RD selecting to operate in FT mode (RD_{FT}) and initiates radio resource coordination and beacon transmissions. Other RD(s) perform association procedure in PT mode (RD_{PT}) with the RD_{FT}.

Local Area Wireless Access Networks in Cellular Network Topology

A single-cell network topology involves in principle two types of Radio Devices (RDs): an RD operates in FT mode (RD_{FT}) as a base station, which is a component of the fixed network infrastructure, other RDs operate PT mode (RD_{PT}).

A multi-cell topology is a deployment of multiple RD_{FT} as base stations in a fixed network infrastructure, where each base station is serving its own dedicated cell area and RD_{PT} can move from one cell area to the other.

Mesh network topology

In mesh networks DECT NR+ devices can communicate directly to each other extending the range of the network and increasing the reliability of communication. The mode (FT and RT) of the involved radio devices may change autonomously depending on the context of the communication. Each radio device can act as a node transmitting a message, as a node forwarding any message from another radio device or as a node being the destination of a message. Each radio device can communicate directly (device to device) or, if not in range, indirectly - via other radio devices establishing a communication route - with each other which minimizes the probability of outage.

Mesh topology can support high device densities and the autonomous routing provides the ability to adapt dynamically to the radio environment and the requirements of radio devices in the network. To achieve efficient mMTC operation the mesh system is scalable to a very high number of networked devices, the routing is based on cost value, without the need to maintain routing tables in each device.

The mesh system operation is based on a clustered tree topology where each RD decides the next hop individually based on available routes towards the RD providing the connection to the external internet in FT mode (RD_{FT}).