Call for Evidence response form

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Your response

Question	Your response
Q1. How are audience demands and expectations evolving, and how does that vary for users of different TV platforms and different demographics?	Please see further additional details in this document submission

Q2. What do audience trends mean for the financial prospects and sustainability of TV distribution platforms, and what are the key decision points over the next ten years?	Please see further additional details in this document submission
Q3. How do broadband networks and supporting infrastructure need to evolve to support resilient delivery of TV over the internet in the future?	Please see further additional details in this document submission
Q4. In what ways might different types of 'hybrid' terrestrial and internet services deliver benefits for audiences and what risks may arise?	Please see further additional details in this document submission
Q5. Given the sharing of infrastructure, what would the implications for other sectors be if there was a change to the use of digital terrestrial television (DTT)?	Please see further additional details in this document submission
Q6. What coordination and planning across the value chain might be necessary to secure good outcomes for audiences and key providers over the long term?	Please see further additional details in this document submission

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Q1. How are audience demands and expectations evolving, and how does that vary for users of different TV platforms and different demographics?

As in Section 2 of the consultation document, linear TV content continues to be popular amongst particular age and socio- economic groups and we expect this requirement will continue for some time yet to come. Any thoughts or plans of free to air linear TV switch off entering into the public domain are likely to be met with the same level of resistance as was previously seen with the proposal to switch off FM services.

That would be for similar reasons in that something which has been seen as a free to all universal service, notwithstanding the payment of a licence fee, being replaced with content access that requires an additional access payment of some type, will automatically be seen as a degradation of a public service or an additional cost burden on individuals with no perceivable new benefit.

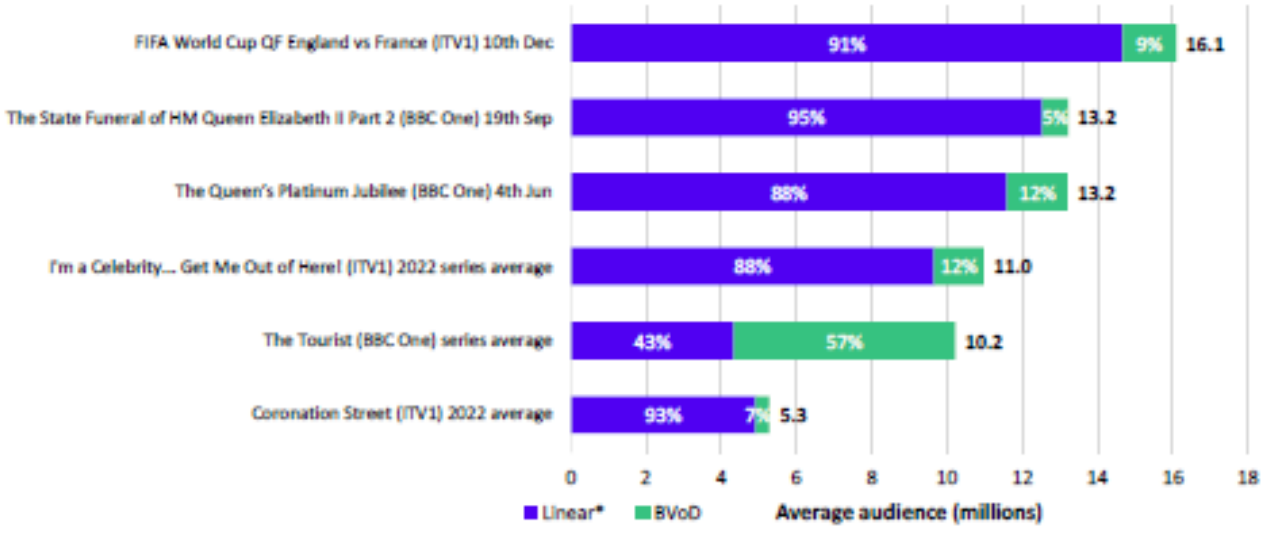
Additionally, whilst other demographic groups are choosing to view content by different means and platforms, broadcast linear TV is still the go-to, or default, viewing option for the most important public and popular events.

This is particularly true of major sporting events, those of national importance, or where an outcome or announcement will have an immediate effect.

Linear TV delivers a cultural impact in that everybody can share together in the joy, disappointment or emotion of a live outcome or event conclusion. It can also be of major national importance as the recent broadcasts of Royal events have shown, or significant announcements of concern as was demonstrated during the Covid pandemic years.

Table 9 on page 15 of the Ofcom Media Nations: UK 2023 report directly demonstrates this. Here you can see that 88% or above of the viewing audience for the most significant occasions in 2022 viewed those events in a linear way.

Figure 9: Proportion of viewing to selected programmes, linear and BVoD: 2022



*Source: Barb, 28-day consolidated, all individuals (4+), all devices. *Linear refers to viewing across all the broadcast channels owned by each broadcaster (watched live and recorded within 28 days). BVoD includes all content watched via the on-demand services owned by each broadcaster include non-linear programming.*

Only Broadcast can deliver that content to everybody in a direct way and, crucially, to everybody all at the exact same time without blocks, hold ups, delays or reliance on multiple delivery platforms. On the other hand, broadband internet connections are facing a rapidly growing demand for data transfer. This demand is not only driven by video on demand applications. New applications such as artificial intelligence, cloud applications or continuous software updates for almost every technical device in a household are part of this ever-growing demand for bandwidth. The effects of this can be reduced data rates, long latencies and sometimes even complete interruptions of service.

Whilst the demographic profiles given in Figure 1, on page 7 of the call for evidence document are assumed for households receiving linear TV as a constant, there will remain the need to reach as large an audience as possible, by a single delivery platform, as a minimum for events of significance or disaster.

The age and vulnerable user profiles match with viewing content on fixed devices which has been the norm until recently.

This is limited at the moment as mobile devices are currently unable to receive viewing content via the Broadcast networks. That, plus the type of actual content, is now changing. In the near future we expect to see the availability of linear and other types on content on mobile as well as current fixed devices. The base for this change is ***5G Broadcasting***, a new solution already specified by 3GPP in release 14 and 16.

International broadcast specifications are changing to make that additional use of the broadcast spectrum possible and are being taken up quickly in other countries. New ITU specifications such as ITU-R BT 1833-5 Multimedia Systems L for 5G BC are already in place for this.

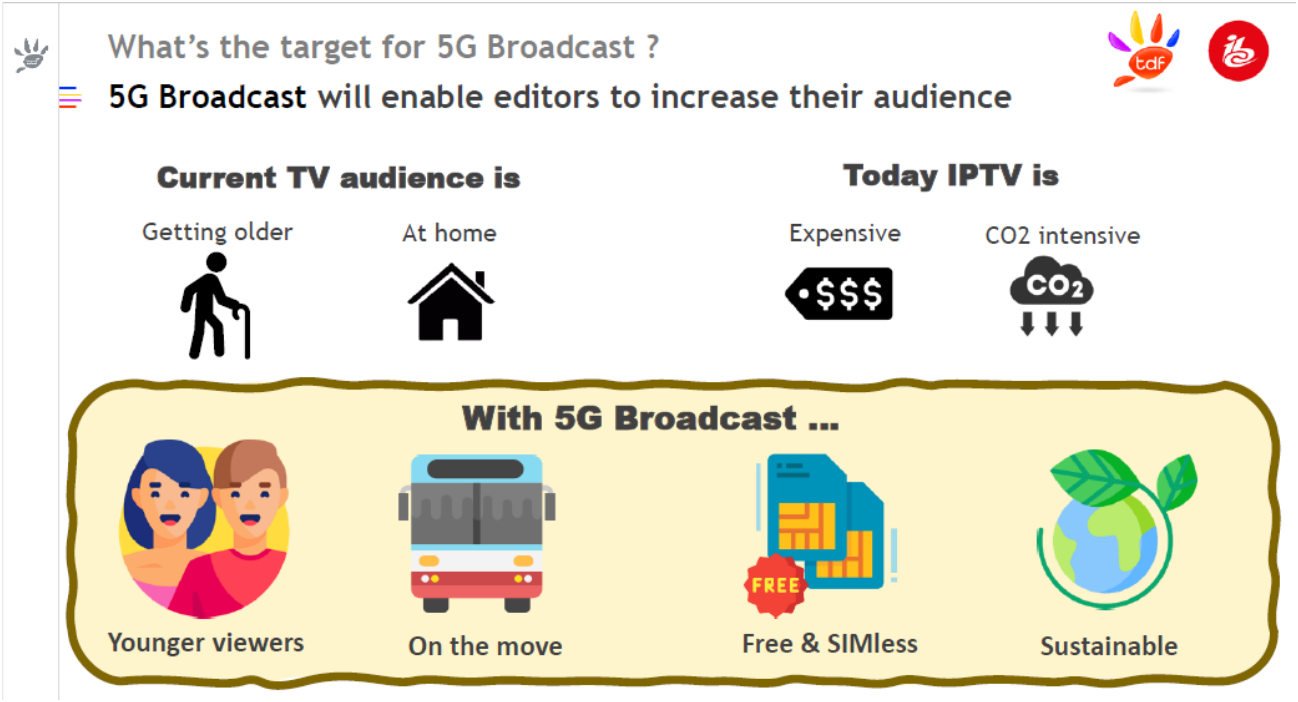
That significant change could suddenly alter the demographic profile of users of linear TV and other broadcast content with little change to the existing TV distribution system. Those younger audience profiles, currently seen as becoming out of reach with the existing broadcasting set-up, will then have potential access to linear channels and other content that right now they do not see. That is not necessarily because they have no interest in linear TV output but because the devices that they know and hold do not currently allow that free to view content to be received easily and directly.

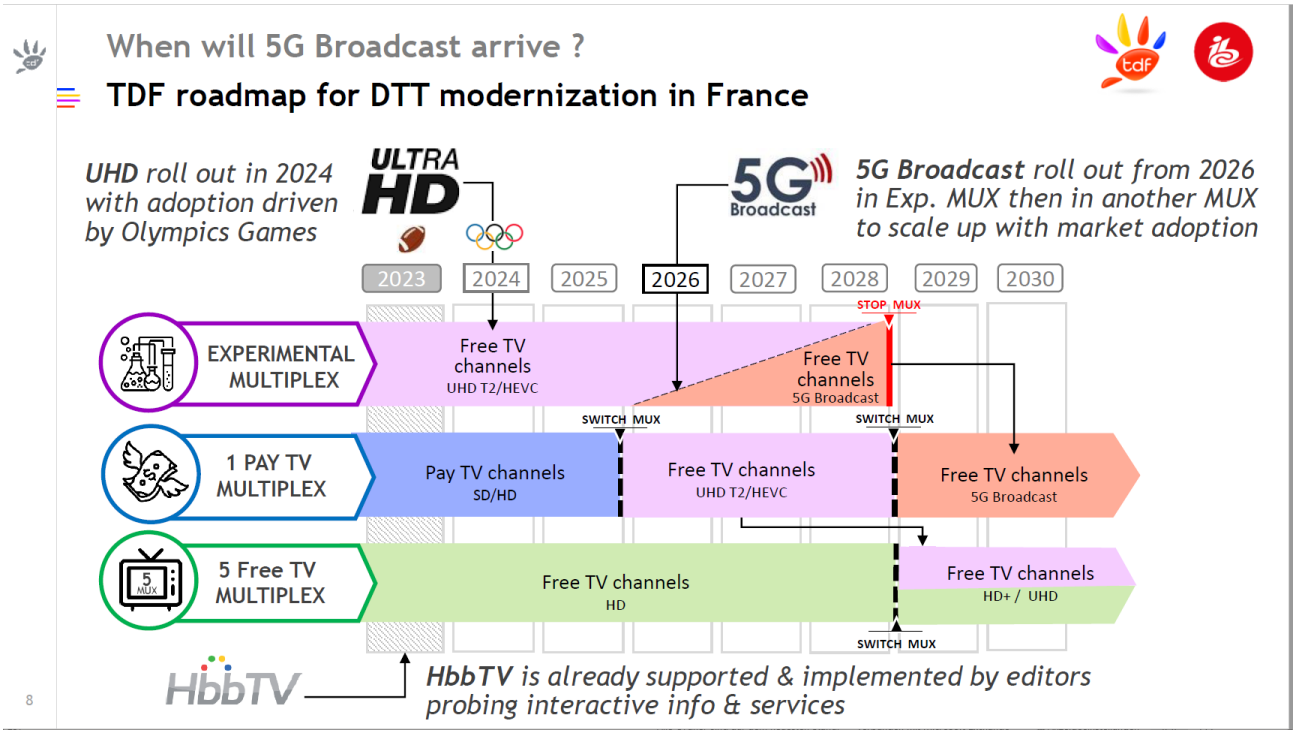
Whilst this would be a technological change it is within the same UHF spectrum band and the same TV distribution system, now though with an ability to connect again with a wider demographic with linear and other content.

Where organisations have a commitment to reach out to as wide an audience as possible, either publicly or commercially, such a technological change within the existing spectrum band could be a game changer when the next generation mobile devices enter the market place.

ITU Multimedia System L also supports free-to-air (FTA) and receive-only mode (ROM) services over 3GPP thereby fulfilling a requirement to reach audiences without extra expenditure to watch free to view content on their device i.e. without the need for a SIM card.

In other countries we see this change already occurring. French broadcaster TDF presented at the IBC Show in Amsterdam in September 2023 a plan for a step-by-step migration from DVB-T/T2 to 5G Broadcast. The underlaying demographics are very similar to the UK market. The younger audience is on the move and not sitting in front of a fixed TV set at home. This is why it is seen as mandatory to extend the audience of broadcast distribution to this growing part of the population.





At the same time, introducing an IP based 3GPP Standard to the existing broadcast infrastructure will provide a sustainable means of distribution of large data volumes to mobile users and devices.

Q2. What do audience trends mean for the financial prospects and sustainability of TV distribution platforms, and what are the key decision points over the next ten years?

The most important decision point is to give certainty in the continuation of the existing use of the UHF DTT spectrum post 2034.

Certainty in continuation allows for network refresh to go ahead in confidence and to a greater extent. That technology refresh would bring with it further gains in transmission power efficiency thereby reducing total carbon emissions with the associated environmental gains. It is important to mention that new generation broadcast transmitters can already be prepared for future/new broadcast standards, as with the above mentioned 5G Broadcast. By this, upgrades installed in the next few years to come in the DVB-T/T2 network are preparing the infrastructure already for possible future adaptions, should they be seen as beneficial/required.

Overall, the UHF broadcast platform then becomes sustainable to a higher degree for the foreseeable future with increased environmental benefits for all.

Additionally, continuation certainty allows technology suppliers to confidently plan R&D budgets further ahead to sustain research and bring new efficiency and sustainability improvements yet to be realised.

As there is no sight of any alternative for efficient and sustainable use of the same spectrum area, it would then seem far too early to think now of any major change to UHF TV spectrum use. An early decision therefore to continue with the existing broadcast use of the UHF TV spectrum post 2034 would likely bring the greatest benefits to a UK audience.

This is an important consideration as the broadcast of content in both the UHF and VHF spectrum is still the most efficient way of reaching a target audience compared to other methods, even without technological refresh for efficiency gains mentioned above

Evidence from BBC R&D Blog on energy used to distribute and watch TV programmes (update October 2021) helps to highlight this point.

https://www.bbc.co.uk/rd/blog/2020-09-sustainability-video-energy-streaming-broadcast

*The total energy use across all four platforms of terrestrial, satellite, cable and iPlayer for 2016 was **2,000** GWh which was 0.6% of total UK electricity use.*
*We found that the energy use of streaming video per hour (**0.19** kWh/device-hour) is similar to that of satellite (**0.16** kWh/device-hour) and cable (**0.15** kWh/device-hour); terrestrial television uses less than half of the other platforms (**0.06** kWh/device-hour). (Updated and revised figures in bold, June 2021)*

For every platform, we found that the devices in the our audiences' homes used more energy in total than in our distribution chain. Overall, the home equipment (including mobile phones) accounted for over 90% of the total energy use. We found this surprising as often TV transmitters are thought of as being big power hungry sticks on hills compared to TV sets and set-top boxes, but it turns out that when you add them all up together, they massively dominate.

In terms of audience reach, the existing UHF spectrum supports this with its longer wavelengths and lower re-use of frequencies across a national scale. This is why a relatively small number of high-power broadcast sites reach very high numbers of households viewing content on fixed devices or, in the future, including new mobile users.

Q3. How do broadband networks and supporting infrastructure need to evolve to support resilient delivery of TV over the internet in the future?

Cabled broadband networks work for fixed devices or those within close reach of a connected router and not via an independent fixed or mobile antenna

Broadcast provides the original and alternative secure delivery platform for greater public reach. In being less reliant on multiple commercial vendors in a distribution chain, either as the delivery platform or content provider, means that services can continue to be broadcast to all with a lower risk of those services being interrupted.

Broadband networks have been in a catch-up mode since the beginning. Starting with dial-up modems, demand for higher data rates has driven innovation up to today's broadband internet connections. While full fibre at home might seem sufficient from our current point of view, it might not be in 10 years from now. The usable data rate for the consumer is always depending on the demand in a certain cell (fibre or cellular). In other words, if many households are picking up fibre to home, the available data rate will be reduced for everyone in a certain area. To overcome this limitation, the backbone infrastructure would have to be massively expanded. It would never be reasonable however for a broadband network to build the capacity for peak demand times that occur only for a limited time. These are the moments when a reliable Quality of Service is required e.g. big political or sports events, disasters etc.

The broadband internet connectivity for average households has a lower degree of resilience built in compared to the broadcast networks. Services can be interrupted for a multitude of reasons, even for extended times. In many cases a simple power outage in the area of the cellular tower is sufficient to mute a whole cell. Quite often you also see in the news that an excavator has ripped a cable in the ground, leaving a large area without power/phone/internet. Such interruptions are usually not fixed in minutes or hours, but rather days.

For a reliable and resilient delivery of TV over internet, these very basic weaknesses would have to be addressed before moving services permanently to IP.

In contrast to that, broadcast transmitters are usually placed on elevated ground and not in danger of flooding. The most important stations are backed up by alternative power supplies. They receive redundant input signals via diverse RF based platforms that are not reliant on any cables in the ground. This resilience of the broadcast infrastructure is particularly important in times of emergencies or disasters. It is the most reliable way to reach the population with important messages and advice. This is independent of the transmission standard, let it be FM, DVB-T/T2 or possibly 5G Broadcast in future. Bringing the resilience of broadband internet services to a comparable level will be a very difficult task.

Q4. In what ways might different types of 'hybrid' terrestrial and internet services deliver benefits for audiences and what risks may arise?

Hybrid, in terms of content delivery across various delivery platforms, is the model for the future.

Broadband networks will continue to reach out and evolve, thereby becoming the dominant delivery platform for fixed devices or those within easy reach of a connected router.

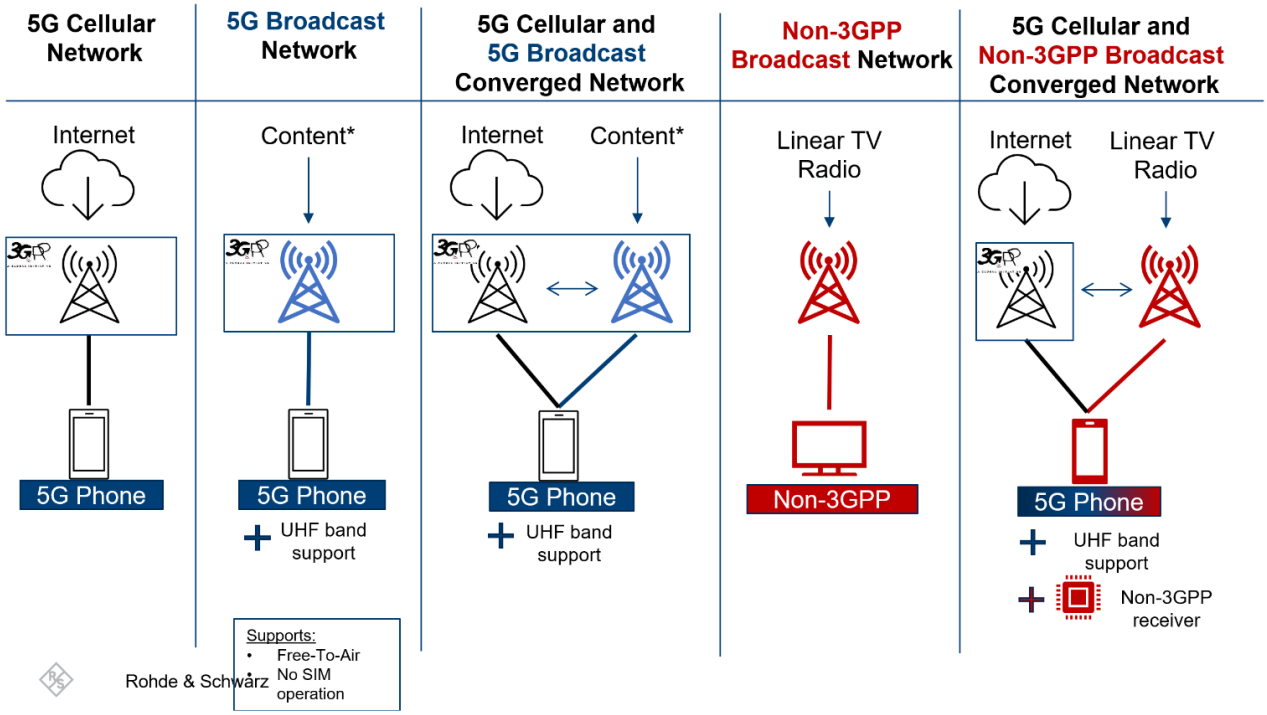
They cannot reach the mobile user though, especially where the user is distant or travelling and, as in our response to Q3, are not necessarily resilient in being available in cases of importance or emergency.

Mobile networks do reach out further but those networks are constrained in that they are not broadcast. Anybody wishing to get the half time updates at a major league sporting event via a mobile network can attest to just how long it takes to get even the most basic textual based information. A broadcast overlay on top of a mobile unicast or multicast model can help solve that problem

Continuing with linear TV in the existing UHF platform still makes the best, and most sustainable, use of that spectrum as in our response to Q2.

There are other uses though for co-existence within that same spectrum area where broadcast transmissions using other technologies can deliver new benefits to the same audiences or reach out to other demographics as pointed out in our response to Q1.

The below helps to illustrate where we already see hybrids emerging in broadcast where there is convergence with new 5G Cellular networks and Broadcast content.



Other advantages of using such a hybrid model to bring new technology to co-exist in the UHF spectrum area are as follows.

- Distribute public and commercial linear TV, radio services as well as live content, FTA or encrypted, to 3GPP-compatible devices such as smartphones, smart TVs or in-car infotainment systems. The main aim of 5G Broadcast is to complement existing cable-provided services namely in the areas where cable connections are not well established

- Enabling personalised media offers by delivering linear broadcast content along with catch-up or on-demand services using the same family of standards (3GPP). With such options, 5G Broadcast is aiming at bringing both broadband and broadcast closer. This can create new business incentives between the broadband and broadcast worlds.

- Enable broadcast distribution of linear TV and radio services integrated into existing media applications with 3GPP-defined APIs.

- Enable seamless integration with Public Safety broadcast services (like emergency broadcast messages) with integrated text / multimedia and possibility of add-on interactivity via broadband connectivity

- Flexibility of deployment with high-power high-tower (HPHT), low-power low-tower (LPLT) and medium-power medium-tower (MPMT) depending on the scenario, application, and geography under consideration.

- 5G Broadcast is endorsed by ITU-R (WP6A and SG6) considered as a new worldwide digital terrestrial broadcast (DTT) standard and labelled as “System-L”.

- Austria is the first European country to officially consider 5G Broadcast as a new DTT standard in the country, in addition to the already exiting DVB-T2 services:
https://www.ris.bka.gv.at/eli/bgbl/II/2023/61

- European Space Agency (ESA) is seriously considering 5G Broadcast as a potential GNSS background-based solution: https://navisp.esa.int/news/article/Resilient%20PNT%20based%20on%205G%20broadcast

- 5G Broadcast is a broadcasting technology designed with hardware reuse of cellular modems in mind.

- Features needed for broadcasters (high-power deployments, operation without SIM card, support of UHF spectrum, support of fixed reception) are supported by 5G Broadcast.

- Integration with the 3GPP stack allows for advanced features such as emergency notifications, interactive broadcast, etc.

- The 5G Broadcast system, apart from its ease of integration in handsets, inherits features of cellular systems such as support of multiple antennas, carrier aggregation, etc.

- New band definition work underway in 3GPP for introducing 6/7/8MHz channel bandwidth. This is a Rel-18 independent WID.

- The 5G Broadcast system has seen continuous evolution during the last few releases and may be further enhanced if new use cases / requirements arise.

- There are also models for offloading content from the broadband network to a broadcast infrastructure, not only for distribution of linear TV, but also other content e.g. new software releases, whenever the demand for the same content passes a certain threshold in a dedicated area. However, it must be clear that this would have to be realised in non-broadcast spectrum in order not to jeopardise the further existence of traditional broadcast.

Q5. Given the sharing of infrastructure, what would the implications for other sectors be if there was a change to the use of digital terrestrial television (DTT)?

As in our response to Q1, a change to, or loss of DTT could be automatically seen as a degradation of a general public service with a loss of a 'free to air' broadcast distribution method.

Should such a decision consequently impact the continuation of other free to air services within the VHF radio spectrum, this direction should be viewed as not acting within the wider public interest.

Placing other broadcast platforms in direct risk of continuation with the loss of DTT could bring an early closure to services which require continuity and certainty over longer notice periods for commercial reasons.

If those closures are not planned, or foreseen for spectrum reasons, then empty spectrum could suddenly become available without a new use or identified operator.

There should also be a view to protect certain spectrum bandwidths for future as well as current use.

We already see alternative uses for the same spectrum area in the near future as mentioned elsewhere.

These are all generally for free to air or free to receive content and for other services that benefit the population as a whole. They are however also reliant on the existing shared broadcast structure remaining as it currently is.

Sustainability should also remain a consideration.

The broadcast networks, sites and stations that we currently operate have taken many years to create with substantial buildings and structures at key positions within the UK. All of that construction created substantial carbon emissions at the time and should therefore be maintained and used for the best possible purposes into the future.

Any possibility of losing that critical infrastructure and replacing it with new build elsewhere, with associated new carbon emissions, would not seem to be the correct direction of travel as regards environmental protection.

Changes to the DTT network could also have a big impact on future public alert systems. Considering the climate change we are facing, severe winds, flash flooding or hail storms can be expected more often. Many such crisis situations have shown in the past that they can wipe out large portions of infrastructure in an area. Reaching out to a widely distributed population in such cases would then become very difficult, potentially causing life threatening situations.

Any changes to the DTT network should always have the goal to keep the existing network relevant for the changing market. There are ways to re-connect the audiences currently leaving DTT behind. Spectrum efficiency can be enhanced with additional services that can be located within the broadcast spectrum. Even a merger between TV and audio broadcast is possible, as shown in the "BBC 5G Rural First" project (https://www.bbc.co.uk/rd/blog/2019-03-5g-rural-first-network-orkney).

Having the essential initiative of reducing the general carbon footprint will demand maximising the efficient use of the broadcast network rather than moving to a broadband only infrastructure.

Q6. What coordination and planning across the value chain might be necessary to secure good outcomes for audiences and key providers over the long term?

The best outcome for the wider public, and audiences in general, in looking at TV distribution in the future is to keep open as much choice as possible without closing down or significantly changing content delivery platforms.

Each delivery method, plus new methods yet to be realised, bring with them their own specific benefits. Having as much choice as possible for audiences helps to drive not just commercial competition for audiences but also new technological benefits. It also helps to reach out to as wide and diverse as possible an audience as each demographic may choose which delivery method works best for them, most likely with a use of multiple delivery methods by any given person on any given day.

Besides the continued regulation of spectrum use, Government appointed bodies and commercially supported associations should also be seen to encourage cooperation in delivery methods between key providers. This is to ensure the most efficient use of available spectrum and bandwidth in each case and always to the public benefit.

As such we would encourage and support such organisations to bring together as many as possible significant stakeholders to model together what the future possibilities are and how they can bring benefits to the widest audience possible.