Invitation to Tender (ITT)

Independent study on the Future of the UHF band after 2034: an analysis of options

14 November 2024

Background

During WRC-23, mobile was given a secondary allocation within the UHF band (470 to 694 MHz) by many Region 1 national administrations. This band is allocated to the Broadcasting Service, typically Digital Terrestrial Television (DTT), on a primary basis. It is also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting and programme-making, more commonly referred to as Programme Making and Special Events (PMSE).

It is now also allocated to mobile on a secondary basis in 44 European Conference of Postal and Telecommunications Administrations (CEPT) countries, excluding Italy and Spain. The 614-694 MHz band is allocated on a co-primary basis to mobile and identified for IMT in 11 Arab countries. In this framework, the next opportunity to review the mobile/IMT allocation will be WRC-31.

In parallel, the Government tasked Ofcom with monitoring trends in audience behaviour and providing a list of options for the post-2034 landscape. The current UK DTT broadcast licences are set to expire in 2034, as mentioned in the Ofcom report to Government on these options.[1] With a review scheduled for WRC-2031, the UK retains the ability to decide domestically on the use of the UHF band, informed but not constrained by WRC-23 decisions.

In its report to Government, Ofcom noted that in recent years there has been a significant shift in viewing habits, with more people watching TV online due to widespread broadband adoption, device evolution, and new platforms for consuming content, including a shift from linear to non-linear viewing habits. Much of the remaining viewership will come from households that rely solely on DTT, which are more likely to include older, less affluent, or disabled individuals. Within this context, Ofcom provided a response to Government with three approaches to consider:

- **1. Investment in a more efficient DTT service** – a more efficient, but full DTT service could be an option if audience scale and investment could be sustained over the 2030s. This option may well include supporting audiences with new equipment for more efficient broadcast signals.
- **2. Reducing DTT to a core service** – the DTT platform could retain a minimum number of core channels – for example the main public service and news channels. This would mean viewers mainly using the internet to access TV services, while also maintaining infrastructure that could deliver radio or TV, including if there are internet outages. This could be done as a temporary transition to a fuller switch off or remain indefinitely as a provider of last resort.
- **3. Move towards DTT switch-off in the longer term** – a planned campaign to ensure people are confident and connected with internet services, so that DTT can be switched off. It would take careful planning to ensure universality of public service media, with support for people so that no-one is left behind. If carried out effectively, this could have wider benefits for digital inclusion in other areas of society.

[1] Ofcom, Report: future of TV distribution, 09 May 2024.

In 2022 the SPF commissioned Coleago to study current use, market, and technology developments, as well as potential changes in viewing and consumer habits, and their report proposed four potential regulatory scenarios for the future of 470-694 MHz frequencies[2]. The four scenarios were: - Scenario 1 'Status Quo' - Scenario 2 'Flexible Use' - Scenario 3 'IMT600 band plan' - Scenario 4 'Transition to IPTV'. In light of Ofcom's report and three approaches, it is timely to review the findings of this SPF study, along with other relevant considerations and factors now and in the period to 2034.

If the UHF band were to be reallocated for mobile use, the mobile sector argues that the spectrum can be particularly useful in providing means to avoid congestion and improve coverage and user experience, particularly in locations where low frequency spectrum is particularly suited to provide coverage (such as in-building or in rural areas). With the growing mobile data traffic, technological development in massive MIMO could create short-term capacity in higher bands, whilst small cells could enhance total network capacity in urban areas. Mobile network operators argue that additional low band spectrum is the most cost-efficient way to upgrade specifically rural sites towards more performance and capacity.

Programme Making and Special Events (PMSE), as an existing and extensive user of the band, will continue to require access to a significant amount of sub-700 MHz UHF band spectrum if large events and important production venues are to remain viable (as a secondary user to DTT). The PMSE harmonisation in the UK has made available the DME band above 960 MHz for PMSE to share with aero and other uses and this is becoming more used although other countries have yet to take this decision.

Given the wide-ranging impact of any changes to the use and allocation of the UHF band on both the markets and society, the study will gather evidence on the current spectrum usage for DTT and explore potential spectrum efficiency gains in each of Ofcom's three proposed approaches. All of the options Ofcom has proposed will need careful consideration about the potential impacts on costs to current users and the potential benefits of new users of spectrum in the UHF band, but also about overcoming barriers to broadband uptake, enhancing the usability of connected TV, and exploring greater spectrum compression in DTT. Additionally, considerable planning and coordination would be required to mitigate the distributional impacts on various stakeholders, ensuring a balanced approach to spectrum reallocation.

Scope

The research project will seek to understand how spectrum allocation of the UHF band would be best organised to achieve the most efficient use in each of the scenarios identified by Ofcom's response to Government on the future of TV distribution.

To deliver an impact within the resources of the project, its scope will be tightly controlled and work packages focussed only on unique spectrum subject matters. The objective of this study should be on ensuring views from all relevant industry spectrum parties are correctly represented, including the mobile sector, PSBs/broadcasters, and PMSE. Hence, the research should assess the potential technical and economic benefits of DTT spectral efficiency improvements to the delivery mechanisms.

Considering previous studies have delved into the potential use of Single Frequency Network (SFN) and Multi Frequency Network (MFN) designs and the impact on multiplexes, within the current approaches the aim is to expand on the precise re-engineering that would be required of the DTT network, choices of coding and modulation rates, alternative

[2] Future Utilisation of the 470-694 MHz Band in the UK, • Coleago Consulting

multiplex licensing models, and use of guard intervals for SFNs and MFNs and the impact of these choices on coverage, capacity available, ease of transition, complexity of network and compatibility with DTT plans of neighbouring countries. The present study should outline impacts on overall spectrum needs and on the cost of migrating to more efficient video codecs, particularly MPEG-4, HEVC and VVC (and in the case of these latter two codecs the level of support for DTT reception in current TVs in the UK market).

The aim is to support the future work of the UK Government and regulators to identify potential efficiencies and means to use the UHF band. Due account needs to be taken on PMSE and broadcasting as part of the overall solution. Along with requirements for any potential new users of the band.

Expected deliverables

1. A report detailing the findings including:

    a) Potential options for updating DTT in scenarios 1 and 2 from Ofcom's review, including a preamble and examples for each scenario, which considers:

        i. Detail the spectrum efficiency upgrades potentially required (such as upgrading to DVB-T2 and implementing up-to-date coding – including MPEG-4), SFN and MFN, etc.
        ii. Provide estimates for the transition and ongoing costs and timescales involved, considering the installed base of devices.

    b) Identify the effect of each of the scenarios on incumbent users, such as PMSE, along with alternative frequency bands or delivery channels, considering localised licensing for IMT, and geographic protection of PMSE events and production venues.
    c) The spectrum and capacity impact of scenario 3, for instance, for video traffic / Wi-Fi in indoor environments.
    d) The amount of DTT spectrum that could be reallocated for new users and considerations on the requirements for new users of the band.
    e) The potential added benefits of new services considering mobile broadband requirements from 5G and future 6G (coverage, capacity/quality, cost savings) in these bands, as well as any specific spectrum requirements technology neutral mobile services may have in the UHF band. Accounting for changes in broadband generations and adopting a long-term view with the potential refarming of existing mobile standards.
    f) In the event of a reallocation of some or all the band for mobile use, what would be the potential value for mobile use of spectrum and mitigation costs (net value), considering international benchmarks and past auctions provide insights into the market value of the 617-694 MHz band.

2. By integrating insights from expert interviews in TV technology and thorough desk-based research on R&D capabilities, this study should identify key drivers and assumptions that may impact the value of spectrum, particularly through 2034. Additionally, it should conduct a preliminary scoping exercise to clarify Ofcom's proposed scenarios, such as using "night light" as an interim or permanent measure and the impact various options for a night-light could have on spectrum use.

Cost:

- Total budget is of the order of £25,000 (+VAT)

Timetable:

- ITT issued: 14 November 2024
- Deadline for clarification of questions[3]: 05 December 2024
- Deadline to submit your tender: 12 December 2024

Duration:

- Expected duration of the study: approximatively three months, including delivering the report.
- To enable transparency and more efficient delivery management, it is suggested, at the time of commencement of the report, to establish monthly checkpoint meetings, during which UK SPF could provide updates on the progress and the findings of the research as well as to invite for a mid-point peer review of the final report.

Evaluation:

- The scoring system is as follows:

Criteria	Weight
Understanding the requirements	20%
Relevant experiences	20%
Methodology and approach	20%
Project management	10%
Resources allocated (CVs)	20%
Price	10%

Notes for bidders:

- Individual bidders are not discouraged however given the data requirements we will prioritise organisations/group submitters
- Unsuccessful bidders will receive their scores to help inform future tenders
- The successful contractor will be required to meet (in person or virtually) with the UK SPF drafting group to provide regular updates and feedback
- The successful bidder is expected to work with the UK SPF secretariat to create a press release and publicise the report and its findings
- Interested companies should contact Tales Gaspar at tales.gaspar@techuk.org for Terms and Conditions. Any contract or order awarded as a result of this ITT shall be subject to these Terms and Conditions. Any reference to your own conditions of contract/conditions of sale in your standard bid documentation shall be specifically withdrawn.
- Interested companies should submit one electronic copy of their quotation per proposal –including financial and technical proposals – to Tales Gaspar at tales.gaspar@techuk.org by 17.00 BST on the date stated in the Timetable. Your quotation is expected to include all required information, or clearly state the reason for being unable to do so. Any assumptions used in preparing responses should be clearly stated.

[3] If the bidder(s) may wish to seek clarifications concerning the invitation to tender (ITT), please get in touch with Tales Gaspar by by 17.00 GMT on the date stated in the timetable

- The technical response, covering aspects such as understanding the requirements, relevant experiences, methodology and approach should be limited to a maximum of 5 pages. Your quotation shall be firm, fixed and capable of acceptance.
- Please direct any questions relating to clarification of the ITT by email to Tales Gaspar (tales.gaspar@techuk.org).
- By submitting a response, you accept that you understand the requirement and have sufficiently addressed all aspects of the tender and information provided and that you have checked all stated details, such as prices, to be correct and as intended.