

Response to the EU’s Public Consultation on the Future of the UHF TV Broadcasting Band: the Lamy Report

To make processing easier, our comments are organised according to the consultation response form at EUSurvey (<https://ec.europa.eu/eusurvey/runner/PublicConsultationLamyReport2014>).

However, instead of using that form, we are replying with a PDF document so we can merge answers from multiple individuals and add longer comments.

Section 1 – Respondents’ profile

We are responding as individuals in our personal capacities. Footnoted references to institutional affiliations and activities are purely for identification purposes and do not imply any institutional endorsement of the views expressed herein. Our email addresses and nationalities follow our names in alphabetical order:

- Corinna “Elektra” Aichele <onelektra@gmx.net> Germany¹
- Simon Forge <simon.forge@whsmithnet.co.uk> United Kingdom²
- Robert Horvitz <bob@openspectrum.info> other (USA)³
- Alexander List <alex@list.priv.at> Austria⁴
- Sascha Meinrath <sascha@thexlab.org> other (USA)⁵
- Ryszard Struzak <r.struzak@ieee.org> Poland⁶
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Section 2 - Confidentiality

Our contribution is non-confidential. It should be regarded as public or publishable. Please include it in the official summary of consultation results.

Section 3 - The citizens’ dimension

The last three questions in this section focus on the possible degradation of TV reception. They assume such degradation would be due to the presence of new in-band non-TV transmissions.

¹ Writer and hardware/software developer working with Freifunk Berlin. Freifunk has a German trial license to the end of 2015 for WLAN communications at 482 MHz, for which she is designing and building prototype equipment.

² Founder and proprietor, SCF Associates Ltd., a leading telecommunications policy consultancy.

³ Founder and Director of the Open Spectrum Foundation, Amsterdam.

⁴ President, Open Spectrum Alliance.

⁵ Founder and Director of X-Lab.

⁶ Professor at Poland’s National Institute of Telecommunications, former Vice-Chair of ITU Radio Regulations Board, former acting Assistant Director of CCIR-ITU.

⁷ Co-author of “Beachfront Commons,” cited in footnote 11.

However, the risk of degradation is due as much to the design and performance of DTT receiving systems. Currently there are no European standards – ETSI or CENELEC – setting minimum requirements for DTT receiver selectivity, interference rejection capability or overloading performance. As a result, measured differences among currently available DTT receivers are large, technical specifications tend toward the minimum necessary to avoid immediate complaints, and there is no guarantee that any new television’s performance will be better than older models. We believe that appropriately strict DTT receiver performance standards could reduce the risk of interference from new low-power UHF broadband devices, enabling more intensive band use without significantly increasing receiver prices. More to the point, the benefits to society of new Internet access options at UHF are likely to exceed the cost to end-users of more robust DTT receivers.

Section 4 - Potential repurposing of the 694-790 (“700”) MHz band

What long-term advantages and disadvantages do you see in using the 700 MHz band for wireless broadband services in the Union?

The social and economic benefits of broadband are widely recognised. At the micro level, they appear mainly as consumer surplus creation, labour productivity gains and improvements in operating efficiency for firms, leading to accelerated economic growth and new job creation. In this context, Koutroumpis’ finding that broadband’s contribution to economic growth in OECD countries increases as broadband penetration increases is particularly significant.⁸ We are not aware of any claim that broadcasting has similar self-augmenting economic benefits. So given a choice between broadband and broadcasting, more bandwidth for the former should be preferred.

The special advantage of providing broadband access around 700 MHz is that the cost of network infrastructure should be about 20% less than a similar network operating in the 800 MHz band, and about 78% less than a network in the 2600 MHz cellular band.⁹ Lower-UHF network deployments would thus be commercially viable in more sparsely populated areas, helping overcome the urban/rural “digital divide”. Greater cost savings also come from the use of technologies like Wi-Fi or WiMax rather than LTE or LTE-U. But the greatest socioeconomic benefit would come from making a large block of cleared UHF frequencies available for broadband on a license exempt basis, since that would minimise the spectrum access cost.

Even at this late date, CEPT has not yet formulated a European Common Position on WRC-15’s Agenda Item 1.3 (frequencies for PPDR). CEPT FM PT49 is expected to deliver a report evaluating the options for implementing PPDR broadband in a limited number of candidate bands by the middle of this year and compatibility studies for bands near 400 MHz and 700 MHz are now underway. Apparently there are difficult but not insurmountable challenges in both frequency ranges.¹⁰ In countries that choose to use part of the 400 MHz band for PPDR broadband, spectrum space at 700 MHz could be released for other purposes - not just commercial LTE, but

⁸ Pantelis Koutroumpis, "The Economic Impact of Broadband on Growth: A Simultaneous Approach," *Telecommunications Policy*, volume 33, issue 9 (2009), pages 471-485, <http://www.sciencedirect.com/science/article/pii/S0308596109000767>

⁹ Simon Forge, Robert Horvitz and Colin Blackman, *Is Commercial Cellular Suitable for Mission Critical Broadband?* European Commission study report 2013-0016 (2014), http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=8211

¹⁰ See “Draft ECC Report: Compatibility and sharing studies for BB PPDR systems operating in the 700 MHz range”, meeting document SE7(15)Temp008, 8 April 2015, [http://www.cept.org/Documents/se-7/24030/SE7\(15\)Temp008_Draft-ECC-Report-on-PPDR-at-700-MHz](http://www.cept.org/Documents/se-7/24030/SE7(15)Temp008_Draft-ECC-Report-on-PPDR-at-700-MHz), and “Draft ECC Report: Compatibility studies regarding Broadband PPDR and other radio applications in 410-430 and 450-470 MHz and adjacent bands”, meeting document SE7(15)Temp007, 9 April 2015, [http://www.cept.org/Documents/se-7/24033/SE7\(15\)Temp007_Draft-ECC-Report-on-PPDR-at-400-MHz](http://www.cept.org/Documents/se-7/24033/SE7(15)Temp007_Draft-ECC-Report-on-PPDR-at-400-MHz)

broadcasting or a license exempt commons for longer-range Wi-Fi-like networks, as suggested here and in earlier studies.¹¹

Section 5 - Ensuring regulatory certainty for current users of spectrum

Should there be a common EU deadline for safeguarding primary use of the 470-694 MHz band for DTT and further use for wireless microphones and other wireless audio equipment? (Yes/No) Please provide justification of your answer on a common EU deadline to safeguard existing uses.

This question invites answers justified by a false assumption: if the primary aim of spectrum management were to “safeguard existing uses”, we would still be watching analogue television (probably without colour) and sending text messages via Morse Code. Future use of the UHF band has become a subject of intense interest and debate now precisely because technology and the public’s communication preferences have changed dramatically in recent decades and are sure to continue evolving in the decades ahead. The primary aim of spectrum management must be to adjust the balance between supply and demand so that sufficient wireless bandwidth is allocated to the most highly valued and socially productive purposes - not to preserve the status quo.

We think more UHF spectrum should be made available for Internet access and two-way data communication as quickly as possible. The specifics would have to be negotiated with the countries committed to continuing the use of DVB-T. However, the current trend of video delivery migrating to cable, satellite and the Internet should be encouraged by gradually reducing the wireless bandwidth available for DTT. PMSE might continue operating in TV white spaces or seek accommodation in license exempt spectrum.

Section 6 - Flexibility of use of sub-700 MHz (470-694 MHz) spectrum

Do you support flexible downlink-only use of the 470-694 MHz band also for wireless broadband services, which safeguards primary use of this band for DTT according to national circumstances?

Most Internet use is interactive, based on two-way communication, though the upstream and downstream data traffic can differ greatly in volume. Plans for developing new broadband Internet access technologies for deployment in TV white spaces have been the subject of intensive investigations in Europe and elsewhere for nearly a decade. Those plans have generally not assumed that only downlinks would be allowed. So we question this consultation’s (and the Lamy report’s) emphasis on a downlink-only solution - after CEPT, ETSI, IEEE, ECMA, OFCOM UK, the FCC and other responsible bodies, working in close cooperation with the broadcast industry, have put so much time and effort into formulating rules and standards to enable two-way Internet data traffic in TV white spaces on a no-interference license-exempt basis. The downlink-only

¹¹ For earlier and more detailed discussions of the benefits of license exempt broadband in cleared UHF spectrum, see Simon Forge, Robert Horvitz and Colin Blackman, *Perspectives on the Value of Shared Spectrum Access*, European Commission study report SMART 2011/0017 (2012), https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/scf_study_shared_spectrum_access_20120210.pdf or Jens Elsner and Arnd Weber, “Beachfront Commons”, *Telecommunications Policy*, volume 38, issue 8-9 (2014), pages 709-714, <http://www.itas.kit.edu/pub/v/2014/elwe14a.pdf>

option for broadband should be considered only in countries not implementing EN 301 598,¹² ECC Report 159,¹³ ECC Report 185¹⁴ or ECC Report 186.¹⁵

We propose instead to allocate a significant part of the spectrum between 470 and 694 MHz for license-exempt bi-directional broadband communications (*e.g.*, 100 MHz near 500 MHz), with a power limit of ~ 0.5 W, mandatory state-of-the-art politeness protocols, and mutual/cooperative power control in case of several users present. This should be implemented as soon as possible, *e.g.*, by 2020.

Reasons: License-free data communication is a proven market success delivering substantial benefits to private users and businesses. Currently, however, such networks are limited in power and thus in range, due to regulations and the use of GHz frequencies. Interference from Industrial, Scientific and Medical (ISM) devices, which share Wi-Fi's current allocations, are another problem our proposal addresses: the band we suggest would be license exempt but not open to ISM. We believe users would benefit from the availability of more and better bandwidth for Internet access in spectrum managed as a commons - particularly in spectrum that enables communication across hundreds of meters, with mesh configurations enabling even longer ranges. This approach is likely to reduce the cost of Internet access and other types of data communication for many European citizens, especially outside the major cities, while at the same time supporting offloads of traffic from mobile devices. Band congestion ("tragedy of the commons") would be avoided with protocols ensuring that a minimum capacity for communicating with peers is always available. Such an innovative proposal could revive Europe's lead in wireless technology: cleared UHF spectrum offers a lower risk environment for developing cognitive radio techniques than TV white spaces.

Alternatives: The whole band between 470 and 790 MHz could be used for broadcasting or for downlink-only services, but we think it makes more sense for such services to be delivered via satellite or cable. (Note that our proposal would retain some 130 MHz for one-way links.) However, if the use of 470-694 MHz for broadcasting continues, other applications would necessarily be confined to the DTT white spaces. Our proposal is for 100 MHz of cleared (non-interleaved and non-ISM) spectrum below 694 MHz for license exempt bi-directional broadband.

Section 7 - Harmonisation of use of sub-700 MHz (470-694 MHz) spectrum in the long-term, the European approach and the International Telecommunication Union (ITU) context

What should be the EU position with regard to the 470-694 MHz band for World Radiocommunication Conference 2015? What should be the EU position with regard to the 470-694 MHz band for World Radiocommunication Conferences beyond 2015?

¹² "Final Draft ETSI EN 301 598 v1.0.9 (2014-02): White Space Devices (WSD); Wireless Access Systems operating in the 470 MHz to 790 MHz frequency band; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive", http://www.etsi.org/deliver/etsi_en/301500_301599/301598/01.00.09_30/en_301598v010009v.pdf

¹³ "Technical and operational requirements for the possible operation of cognitive radio systems in the 'white spaces' of the frequency band 470-790 MHz" (January 2011), <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP159.PDF>

¹⁴ "Complementary Report to ECC Report 159 - Further definition of technical and operational requirements for the operation of white space devices in the band 470-790 MHz" (January 2013), <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP185.PDF>

¹⁵ "Technical and operational requirements for the operation of white space devices under geo-location approach" (January 2013), <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP186.PDF>

If the EU and its member states do not enable the development of bi-directional wireless broadband under a license-exempt spectrum access regime at 694-790 MHz, it will be even more important to permit such development in the 470-694 MHz frequency range. Of course interference to incumbents must be avoided. But a total ban on other uses of these frequencies is no longer a politically acceptable solution. Broadcasting's continued use of prime UHF spectrum may hinge on whether the industry can coexist with a growing number of other economically productive and desirable applications. The Commission should take these facts into account in setting common European policy goals for WRC-15 and beyond.

What measures would be needed at national and/or EU and/or ITU level to safeguard flexible downlink-only use in the 470-694 MHz band?

Support at the national, EU and/or ITU level for bi-directional broadband links at 470-694 MHz would automatically safeguard downlink-only uses while affirming the greater flexibility and value of bi-directionality. Downlink-only networks should be considered only where and when bi-directional links are not permitted.

Section 8 - Market review of the state-of-play of broadcasting and wireless broadband services

Should there be a common EU deadline for conducting a review exercise regarding market developments?

Yes

Which date would you propose for such a deadline [The Lamy report proposes a deadline of 2025]?

Regulators need to be pro-active as UHF usage evolves, so reviews and decisions should be made as early as possible. We suggest a scoping study in 2016 followed by a market review and impact assessment in 2017. That will leave sufficient time to consider the implications of changing market conditions during preparations for WRC-19.

What objectives, scope and method should such a review exercise pursue?

The requirements for spectrum and role of TV broadcasting must be reassessed in light of current and emerging market conditions and alternative content delivery possibilities. Various video delivery options (real-time, on demand, mobile, residential, occupational, etc.) must be analysed from the perspectives of content producers, distributors and viewers: which delivery mode is the most popular, the most cost effective, the most technologically stable or rapidly evolving? New estimates and comparisons of the socioeconomic value of other UHF applications and TV broadcasting will be needed. The review must, at a minimum, answer these questions:

- Given the unique physical characteristics of UHF, what are the best uses for wireless links at these frequencies?
- If current uses differ from the best uses, how time-consuming, difficult or expensive would it be to get from where we are to where we should be?