Consultation on 870-876 MHz and 915-921 MHz

About Arqiva

Arqiva is the communications infrastructure and media services company operating at the heart of the broadcast and mobile communications industry and at the forefront of network solutions and services in an increasingly digital world. Arqiva provides much of the infrastructure behind television, radio and wireless communications in the UK and has a growing presence in Ireland, mainland Europe and the USA.

The company supports cellular, wireless broadband, video, voice and data solutions for public and private sector customers.

Arqiva is a founder member and shareholder of Freeview (Arqiva broadcasts all six Freeview multiplexes and is the licensed operator of two of them) and was a key launch technology partner for Freesat. We own Connect TV, the first company to launch a live IP streaming channel on Freeview. Arqiva is also the licensed operator of the Digital One – the national commercial DAB digital radio multiplex.

Arqiva operates shared radio sites throughout the UK and Ireland including masts, towers and rooftops from under 30 to over 300 metres tall as well as a number of international satellite teleports. In Arqiva WiFi we own one of the UK's largest WiFi hotspot providers that enables us to build a unique proposition for WiFi hotspot and outdoor WiFi provision in the UK.

Our major customers include the BBC, ITV, Channel 4, Five, BSkyB, Classic FM, the four UK mobile operators, the Metropolitan Police, Airwave and the RNLI.

Arqiva is owned by a consortium of long-term investors and has its headquarters in Hampshire, with major UK offices in London, Buckinghamshire and Yorkshire.

Introduction and summary

With the 870-876 MHz band having sat unused for many years and having been subject to a number of consultations we welcome Ofcom's desire to try to move the conversation forward. This is particularly important given the ongoing government Smart Metering programme.

The Home Area Network (HAN) is a high value, critical element in the rationale for smart meters. The HAN is the element that ensures that consumers and businesses can receive the information they need in order to justify investment in Smart Metering.

In order to work properly the HAN will need spectrum and the most suitable band that has been identified by DECC is at 870-876 MHz. Given the technical parameters DECC expect for the HAN our interference analysis shows that it is not possible for the HAN to operate if Ofcom adopt the technical conditions currently being considered in CEPT. The multi-billion pound benefits from the smart metering programme are dependent upon the HAN working effectively.

In particular, if the higher power services (including those being considered in the ETSI technical report and at CEPT) are allowed to operate in this band then it will lead to harmful co-channel and adjacent-channel interference to the HAN. Ofcom should not allow higher power services unless, and until, the technical analysis has been carried out to prove that such an authorisation will not lead to harmful interference to the HAN.

There are still significant uncertainties and unresolved issues relating to the 870-876 MHz spectrum. These include standards, technical conditions for the spectrum use and are both domestic and international. In light of these uncertainties Ofcom should, for now, allocate the 870-876 MHz band exclusively to the HAN given it is the most pressing, high value use for this spectrum. This still allows the 915-921 MHz spectrum to be allocated for RFID and other services. As far as possible, without delaying the availability of this spectrum for the HAN, Ofcom should seek to enable GSM-R to co-exist in the future.

Responses to the specific questions are as below

Question 1. What other developments, in addition to the international and public sector developments we have identified, are relevant to our identification and assessment of options for release?

Ofcom only identifies the HAN as an emerging use in its consultation. However the Smart Metering HAN is a high value use for a service with a short term deadline. As Ed Davey (The Secretary of State for Energy and Climate Change) recently confirmed to the House of Commons in November 2012 in his annual energy statement "we will be rolling out smart meters across Great Britain: 53 million new meters will be installed by 2019.[1]" and DECC states the national mass rollout timetable will run from 2014-2019[2]. As discussed DECC below does not expect the 2.4 GHz solution to meet the needs for 30% of homes and the most credible spectrum solution is the 870-876 MHz band has been identified by DECC for the HAN. Ofcom note that DECC are consulting on whether 870-872 MHz should be reserved for the HAN and therefore nothing should be done to preclude this. Therefore this high value use is a priority for this spectrum.

[1] http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm121129/debtext/121129-0001.htm#12112958002050
[2] https://www.gov.uk/smart-meters-how-they-work

Ofcom also need to consider the impact that not ensuring the Smart Meter HAN can operate in the 870-876 MHz spectrum will have on the MoD's auction of 2.3 GHz spectrum. DECC's SMETs consultation noted that using 2.4 GHz spectrum would be required for the HAN (even though they state that is will not meet the needs of the HAN). It is also not clear whether operating the HAN in the 2.4 GHz band is compatible with the MoD planned auction of the adjacent spectrum at 2310-2400 MHz[3]. Any impact on the 2.3 GHz auction will clearly be a consideration for MoD when it decides how and if to release the 870-872 MHz spectrum to Ofcom.

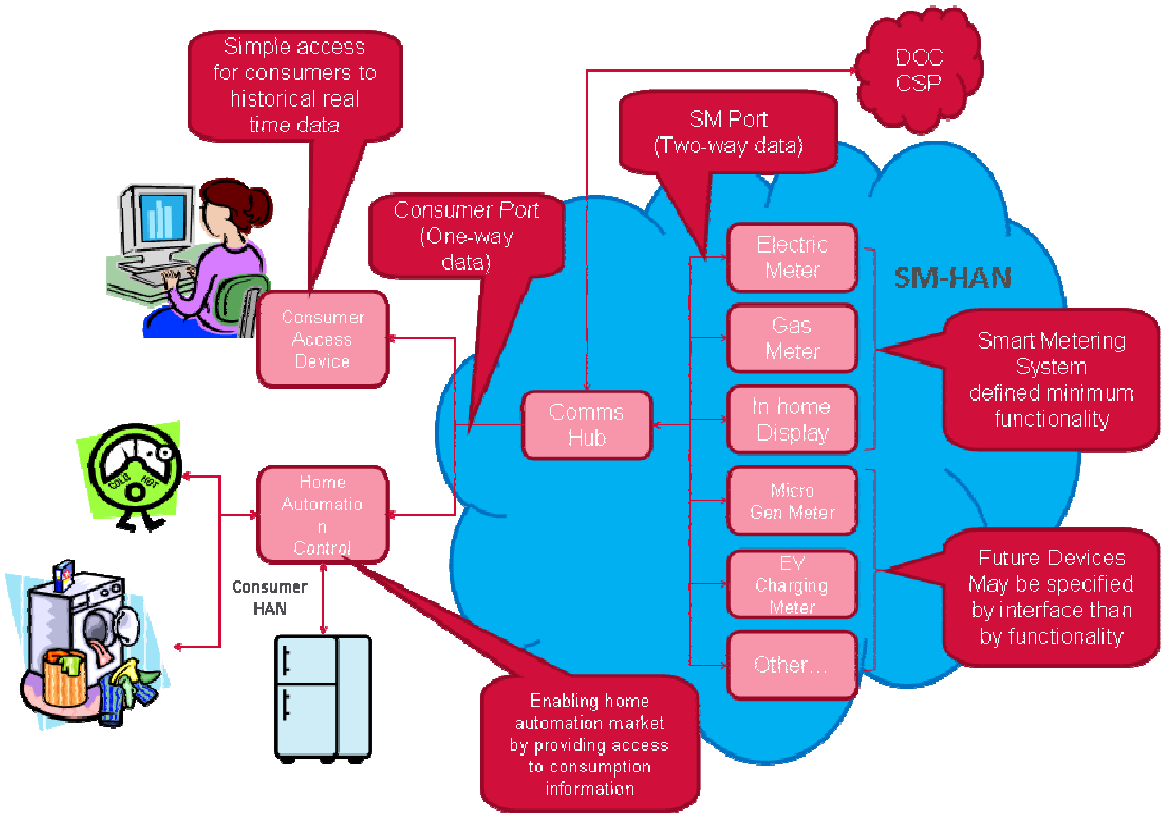
Question 2. Do you have any additional information or analyses that could help to inform our assessment of the value that could be created through different uses of the spectrum?

The HAN is the element that connects smart meters to the communications hub and the In Home Display. It is therefore critical to ensuring that information from the meters pass to consumers in the household and it is also the critical first step in the process to ensure that the information from the meters can get back to energy retailers.

The HAN is a critical part of the rationale for smart meters. DECC's 2011 Impact assessment on "Smart meter rollout for the domestic sector"[4] identified £15.83bn of total benefits from smart meters. Of this just under a third (£4.63bn) was consumer benefit. That impact assessment identifies the consumer benefit coming from "a reduction in overall energy consumption as a result of better information on costs and use of energy which drives behavioural change." As shown in Figure 1 below, this information will only be able to be provided if the HAN functions as expected.

[3] MOD: Sharing defence spectrum. https://www.gov.uk/sharing-defence-spectrum
[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42740/1485-impact-assessment-smart-metering-implementation-p.pdf

Figure 1: The HAN



DECC have determined that the HAN will operate wirelessly, therefore, in order to work properly the HAN will need spectrum. The most suitable band that has been identified by DECC is at 870-876 MHz. DECC's SMETs consultation suggests that the 2.4 GHz spectrum will have to be supplemented with at least 868-870 MHz, probably 870-872 MHz and potentially all of 870-876 MHz.[5] Therefore Ofcom need to ensure that the 870-876 MHz band is allocated in a way that ensures that the HAN can operate effectively and reliably.

Technical analysis suggests that under the current proposal to allocate the frequency bands 873-876 MHz and 870-873 MHz to higher power services on a licence-free or light licence regime for use in line with ETSI TR 102 886 V1.1.1 (2011-07) will cause harmful interference to the HAN, because:

a) Ofcom and ETSI have introduced standards for the band 868-870 MHz, which will prevent the HAN from operating normally in that band due to interference from other permitted devices. In particular, if the HAN is based on ZigBee-868 MHz then it will be interfered significantly by other permitted devices operating in the 868-870 MHz. frequency band Therefore in order to protect HAN from interference and thus allow it to be deployed in a sub-GHz band sufficient spectrum will be required to be made available for its use outside of 868-870 MHz. The prime candidates for this would be the 873-876 MHz and 870-873 MHz bands. However, if they were to be made available for use in line with the ETSI Technical Report noted above, this would create significant and unacceptable harmful interference from services operating on

[5] Para 51 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42953/6129-consultation-second-version-smets.pdf

the parameters in ETSI Technical Report to the HAN making the deployment of the latter impossible.

c) Finally, if the HAN is not deployed in a sub-GHz band, and instead is only working on 2.4 GHz, then this will lead to significant problems in coverage inside the home area as well as loss of connectivity to water and gas meters, especially (but not only) in hard-to-reach cases.

In light of the quantified value that will be delivered by the HAN to consumers Ofcom must demonstrate that allowing an alternative higher power use that precludes this service will deliver a greater benefit.

We welcome Ofcom's position that a licence exempt approach should have the ability to co-exist with ER-GSM. As the work being done in CEPT suggests, there is likely to be a demand for this service in this band in the future. We also note that Ofcom has no current plans to allocate spectrum to this service therefore it is important to ensure that the Smart Metering HAN is not delayed for this reason.

Question 3. Do you agree with our proposal to release 870-876 MHz / 915 -921 MHz for licence exempt SRD and RFID applications if Government releases 870-872 MHz / 915-917 MHz?
Question 4. Do you agree with our proposal to release 872-876 MHz / 917-921 MHz for licence exempt SRD and RFID applications if Government does not release 870-872 MHz / 915-917 MHz?

The MoD has not yet publicly stated what they will do with the spectrum at 870-872 MHz and 915-917 MHz (although they expected to decide during Q1 2013). Equally it is not clear what conditions will be associated with that spectrum, for example Ofcom has not provided any detail on the technical conditions, any service or technology restrictions, duration of access etc. In particular it is not clear what the band edge conditions would be either at 870 MHz or at 872 MHz regardless of whether the MoD release this band or not. Given the potential impact on their 2.3 GHz auction from the HAN at 2.4 GHz, MoD may wish to mitigate that impact.

Even if MoD does not decide to release 870-872 MHz it is important to know what services will be deployed in that band in order to ensure that there is no harmful interference to the adjacent services. DECC have made it clear that 868-876 MHz will, or is likely to be needed for the HAN. It is critical that the HAN is able to operate without harmful interference, and this is not currently possible with higher power services. In particular if the standards being considered in the ETSI report are allowed in 870-876 MHz then they may render the HAN inoperable (as per the analysis above) and so should not be allowed.

Therefore until the technical issues are resolved Ofcom should allocate this spectrum in a way that ensures that the HAN can operate in this spectrum. Once the technical constraints and the compatibility studies are complete it will be clear whether services other than the HAN can operate in this spectrum.

Question 5. Do you have a view on the sequencing and timing of Ofcom's next steps if the spectrum is released for licence exempt SRD and RFID applications?

There are still significant uncertainties and unresolved issues relating to the 870-876 MHz spectrum, many of which Ofcom highlight themselves in the consultation. We have addressed a number of them in the preceding discussion but in summary:

- MoD have not yet publicly stated what they will do with the spectrum at 870-872 MHz and 915-917 MHz but expect to decide during Q1 2013[6]
- DECC is currently carrying out work looking at access to 870-872 MHz for the HAN and plan to give their view on this in Spring 2013[7].
- Further to this the Communication Hub Technical Specification is planned to be notified to the European Commission in autumn 2013 and this will finalise the outstanding matters relating to the design and operation of communications hub.[8]
- In light of this uncertainty over the spectrum and technical specifications of the communications hub, it is too early to assume, as Ofcom does[9], that the Smart Metering deployment in 870-872 MHz would be in line with the relevant technical standards.
- Ofcom note that the European CEPT technical compatibility report will not be available in draft until March 2013[10]. Even after this draft is published CEPT will not finalise these recommendations until autumn 2013[11]. Therefore it is not possible to know now whether or not some of the proposed services are technically possible. In particular until the trade offs that need to be made[12] are understood it is unclear which services may be deployed and how. However as we have noted already, unless there are significant changes adopting the current ETSI report will prohibit the HAN from operating.

Given this uncertainty described above, at this stage Ofcom should allocate the 870-876 MHz band exclusively to the HAN given it is the most pressing, high value use for this spectrum. In light of the consumer benefits of the HAN identified by DECC Ofcom must ensure it is accommodated to ensure that the specific quantified benefits of the Smart Metering programme can be realised. The HAN is of critical importance to the success of the whole smart metering project and, as Ofcom note, licence exemption decisions are unlikely to be easily reversible[13]. Therefore, the correct decision must be made first time. In particular the higher power alternative services that are considered in the ETSI report will cause harmful interference to the HAN and should not be authorised at this stage.

Allocating the 870-876 MHz band exclusively to the HAN has the added advantage that it also allows the 915-921 MHz spectrum to be allocated for RFID (which Ofcom suggest is the highest value services for this band).

There will be significantly greater clarity on all of the international and domestic issues over the next year at which point Ofcom can consider whether other services can also be accommodated in a way that does not stop the HAN from operating. A policy consultation in autumn 2013 on the basis of greater certainty and further technical analysis will not delay any services as Ofcom do not intend to implement this until Spring 2014.

[6] Ofcom Consultation Para 5.2
[7] Paras 131 and 51 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/68902/smart_meters_equipment_technical_spec_2_consultation_response_part_1.pdf (the "SMETS Statement")
[8] SMETS Statement Para 26
[9] Ofcom Consultation Para A5.39
[10] Ofcom Consultation Para A5.40
[11] Ofcom Consultation Para 5.2
[12] Ofcom Consultation Para A5.46
[13] Ofcom Consultation Para 4.10