Statement on 870-876 MHz and 915-921 MHz

Update and Way Forward

Statement

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Section 1

Executive Summary

1.1 Ofcom published an update on the release of the bands 870-876 MHz and 915-921 MHz in January 2013[1]. In that update we consulted on our proposal to release these bands for Short Range Devices (SRDs) and Radio Frequency Identification (RFIDs) on a licence exempt basis, whilst taking into account the requirements for access to those bands that the Government had identified[2].

1.2 Based on:

- the progress made in Europe with new harmonising measures for SRDs and RFIDs by the Conference of European Posts and Telecommunications Administrations (CEPT) and European Telecommunications Standards Institute (ETSI);
- confirmation from the Government that the Ministry of Defence (MOD) has released the bands 870-872 MHz and 915-917 MHz to Ofcom; and
- the 27 responses we received to our consultation[3],

we have decided, in light of our statutory duties, that the bands 870-876 MHz and 915-921 MHz will be made available on a licence exempt basis subject to the CEPT's harmonised technical measures so long as those include sufficient technical constraints to permit the efficient use of the spectrum.

1.3 We will hold a further consultation in Q4 this year following further CEPT work on these bands that will focus on the appropriate technical amendments to the Interface Requirement "IR 2030 - UK Interface Requirements 2030 Licence Exempt Short Range Devices".

1.4 Following that further consultation we will publish a statement and Notice of draft regulations and then, subject to responses to that Notice, make the necessary exemption regulations. We aim to complete this process in spring 2014. This timing will avoid the risk that technical requirements in the UK differ from those in the rest of Europe without good reason.

[1] http://stakeholders.OFCOM.org.uk/consultations/870-915/

[2] The Government's requirements for spectrum access included spectrum for the Home Office, the Department for Business, Innovation and Skills (for Met Office Wind Profiling radars), the Department of Energy and Climate Change (for Smart Metering, HAN), the Department for Communities and Local Government (for Fire and Rescue Service breathing apparatus telemetry) and the Department for Transport (for high speed rail – both for GSM-R and ER-GSM).

[3] http://stakeholders.OFCOM.org.uk/consultations/870-915/?showResponses=true

Section 2

Decision to release 870-876 MHz and 915-921 MHz

Introduction

2.1 Our January 2013 policy consultation on the release of 870-876 MHz and 915-921 MHz provided an update on developments relevant to the future use of these bands and set out our proposal to licence exempt SRD and RFID uses. We noted work by the CEPT and ETSI on the future use of these bands, national public sector requirements and moves to release 870-872 MHz and 915-921 MHz to Ofcom.

2.2 The primary purpose of this document is to set out our decision to release this spectrum on a licence exempt basis, taking account of national and international developments and responses to our January consultation. We also set out our next steps and note matters to be considered in a subsequent technical consultation later this year.

2.3 In this section we summarise the progress and outcome of consideration of UK public sector needs, international developments and set out our decision on how to release the 870-876 MHz and 915-921 MHz bands. Section 3 covers our next steps.

National developments and our conclusions

2.4 In this sub-section we confirm the release of 870-872MHz and 915-917 MHz by the MOD to Ofcom and set out how public sector spectrum requirements will be met.

2.5 In January 2013 the UK Spectrum Strategy Committee (UKSSC)[4] decided that the bands 870-872 MHz and 915-917 MHz should be released by the MOD to Ofcom. The UKSSC requested that Ofcom should take account of both existing and potential new public sector requirements. The existing requirements arise from the Met Office's use of wind profiling radars in the 915-921 MHz range and the Home Office, which makes use of a small part of the 870-876 MHz band for a mobile service. The UKSSC asked us to consider the requirements for new high speed rail networks with the Department for Transport (DfT) and use of the 873-876 MHz/918-921 MHz ER-GSM spectrum; the interest of the Department for Energy and Climate Change (DECC) in smart metering Home Area Networks and the Department for Communities and Local Government (DCLG) requirements for Fire and Rescue Services (FRS) breathing apparatus telemetry.

2.6 Ofcom has worked closely with the public sector to understand the requirements that exist and those new ones being considered; and responded to these by ensuring, as far as we are able, that they are taken into account in the CEPT studies[5]. We are satisfied that the CEPT's new harmonising measures for SRDs and RFIDs take our

[4] The UKSSC is the inter-departmental committee for spectrum policy and is co-chaired by the Ministry of Defence and the Department for Culture, Media and Sport.

[5] For example, the requirements for high speed train communications are currently met using GSM-R across Europe and the CEPT studies for SRDs and RFIDs have taken this into account. See for example CEPT Report 86 (http://www.erodocdb.dk/docs/doc98/official/pdf/REP086.PDF), but other technologies and other spectrum options have not been considered yet.

public sector requirements into account. The position in relation to each of the public sector uses is outlined below.

Wind Profiling Radars

2.7 The Met Office's response to our consultation[6] highlighted that it could not fully envisage how a license-exempt regime will provide sufficient assurance of the ability to protect its existing wind profiling radars (WPRs) from harmful interference; and thus believed that some form of licensing regime would be preferable in respect of maintaining a suitable separation distance. They also highlighted that WPR use currently focuses on the sub-band 915-917 MHz and that future requirements for WPR operation could expect to include an expanded network across the UK over a wider bandwidth.

2.8 The use of a geographical exclusion zone around each of the two existing WPRs[7] would protect these sites. However, it is still possible that the studies will demonstrate that exclusion zones are unnecessary. The timing of our further consultation allows for these studies to be finalised and for Ofcom to take the outcome into account when we make the regulations.

2.9 We have concluded with the Met Office that they will make every effort to design and implement an expanded WPR network across the UK that is compatible with licence-exempt SRD and RFID uses with the expectation of making it un-necessary to specify additional exclusion zones.

Home Office system

2.10 There is an existing use of the 870-876 MHz band by the Home Office which we reported to the CEPT in August 2012[8]. We published further information on the Home Office system in our Information Memorandum on the award of 800 MHz and 2.6 GHz spectrum[9].

2.11 The CEPT studies for SRDs have taken this existing use into account and therefore, subject to the outcome of our further consultation on amendments to the Interface Requirement (IR 2030), no further steps are needed to protect this existing use.

Smart Metering

2.12 A number of the responses to our consultation refer to the Department of Energy and Climate Change (DECC) gas and electricity smart metering initiative[10], its potential value to the UK economy, to technical and licensing issues raised by our consultation and to the need for Ofcom to expedite the release of the bands so that smart metering solutions can plan ahead with certainty. The implications of smart metering for how we release these bands are considered later in this section.

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[6] http://stakeholders.OFCOM.org.uk/binaries/consultations/870-915/responses/Met_Office.pdf

[7] These WPR sites are near Camborne, Cornwall and on the Isle of Man.

[8] 1SE24 Meeting M66, Montegrotto, 27-28 August 2012 (M66 07R0 SE24 WI41 UK Government Services)

[9] http://stakeholders.OFCOM.org.uk/binaries/consultations/award-800mhz/statement/IM.pdf

[10] https://www.gov.uk/smart-meters-how-they-work

Fire and Rescue Services

2.13 As part of the UK Fire and Rescue Service's (FRS) migration strategy for Breathing Apparatus Telemetry, the FRS has been considering a requirement for a 25 kHz channel in the band 870–876 MHz and a national allocation of 100 kHz to meet this. We published further information on FRS breathing apparatus telemetry in our Information Memorandum on the award of 800 MHz and 2.6 GHz spectrum[11].

2.14 Subject to the identification of a suitable allocation[12] for fire and rescue authorities in UHF 450-470 MHz DCLG and the FRS are no longer considering a reservation of 100 kHz for breathing apparatus telemetry in the 870-876 MHz band in recognition of the progress made by Europe to introduce SRDs into this band.

High speed rail

2.15 In April 2013 the UKSSC considered whether spectrum from within the 870-876 MHz and 915-921 MHz bands could be used for high speed train communications and whether all other spectrum options had been explored. The Committee noted that Europe was likely to designate the 870-876 MHz and 915-921 MHz bands as licence exempt and that other Member States had implemented communications services for high speed trains; The requirements for train operational communications are currently met using GSM-R in the UIC[13] bands 876-880MHz paired with 921-925MHz across Europe and the CEPT studies[14] for SRDs and RFIDs have taken this into account. These studies have considered a range of compatibility and mitigation scenarios including:

- adjacent band interference from SRD to GSM-R around 876 MHz
- adjacent band co-existence around 921 MHz
- in-band co-existence of proposed SRD and ER-GSM in 870-876 MHz: including mitigation techniques
- in-band co-existence of proposed SRD/RFID and ER-GSM applications in 915-921 MHz : including mitigation techniques
- Compatibility between LTE and WiMAX operating within the bands 880-915 MHz / 925-960 MHz and GSM-R.

2.16 The CEPT study is currently out for public consultation. Although the study[15] concludes that co-frequency sharing with ER-GSM is possible, it has not explored the option of using alternative technologies in the band for the control of trains or the operational impact of interference. It recommends implementing additional mitigation in countries where the ER-GSM band may be used to support GSM (2G) with circuit switched data. These mitigations may not be sufficient to allow the use of GPRS or next generation radio systems for high speed rail services in the band. We will

[11] http://stakeholders.ofcom.org.uk/binaries/consultations/award-800mhz/statement/IM.pdf

[12] This allocation to be identified through the UK Frequency Allocation Table under a "UK3" footnote, which says that responsibility for assigning frequencies in this band in accordance with the Allocation to Services rests with Ofcom and the Scottish Government for emergency services. See http://stakeholders.ofcom.org.uk/binaries/spectrum/spectrum-information/UKFAT_2013.pdf

[13] UIC: Union Internationale des chemin der fer (The world wide association of railways)

[14] See CEPT Report: 41 and Report 200

[15] See CEPT Report 200.

consider the protection of potential future ER-GSM services and their compatibility with SRD/RFID use when we consult further on the technical arrangements later this year. Our current expectation is that we will specify the requirements for SRDs and RFIDs and the mitigation arrangements in the manner recommended by the CEPT for countries which may use ER-GSM.

Long term requirements for high speed rail and how they might be met using this or other spectrum

2.17 The licence exemption regulations for 870-876 / 915-921 MHz and Interface Requirement (IR 2030) will include protection for GSM-R services, which are already licensed under the Wireless Telegraphy Act, 2006. However, GSM-R as a technology is likely to be life expired before new high speed rail services commence in the UK. We have also noted that whilst the use of GSM-R in the bands 876-880MHz/921-925 MHz is currently mandated within European law[16]this may not allow for migration from one technology to another.

2.18 Further, the spectrum requirements for high speed rail services may include those for train movements and the train control system, for voice communications for railway staff including operational and maintenance staff at trackside and for passenger communications. The mix of low bandwidth, low data rate services to support safety-related requirements and high bandwidth services including those for general passenger communications suggests that the bands 876-880MHz/921-925 MHz may not be sufficient to support a long-term solution for high speed rail for all these communications requirements and that other technologies and spectrum bands need to be considered.

2.19 One option for the safety related requirements could be the bands 873-876/918-921 MHz provided the technology deployed was able to co-exist with SRDs/RFIDs in the band. As noted above, with the appropriate mitigation SRDs/RFIDs use can be compatible with ER-GSM and therefore could potentially be compatible with a future rail communication technology (this would be dependent on the details of its operation). However, in the long term there are a number of bands that could in principle be suitable for meeting the safety-related and passenger communication requirements for high speed rail.

2.20 Ofcom will continue to provide advice to Government on the use of the 870-876 MHz and 915–921 MHz spectrum bands in relation to a long-term solution for high speed rail communications, which support the Government's programme for high speed train services.

International developments

2.21 Since the publication of our consultation in January 2013, there have been significant developments in the CEPT work streams and we are pleased to note that the CEPT's roadmap remains on course with the Working Group on Spectrum Engineering

[16] See ECC Decision on the designation and availability of frequency bands for railway purposes in the 876 - 880 MHz and 921 - 925 MHz bands: http://www.google.co.uk/search?sourceid=navclient&ie=UTF-8&rlz=1T4ADFA_enGB481GB482&q=european+law+for+GSM-R+in+the+bands+876-880MHz%2f921-925+MHz

(WGSE), Work Item 41 (WI-41)[17] scheduled for completion in September 2013. A project plan to deliver a European Recommendation for SRDs in the bands 870-876 MHz and 915-921 MHz is scheduled for Q2 of 2014.

2.22 The inclusiveness of the European processes to give the widest possible opportunity to all SRD technologies, especially those associated with standards that are still under development, was a theme in several of the responses. These responses imply that some SRD technologies emerging from standard's-making bodies that may not have been considered, or considered fully.

Our response

2.34 We consider that the European processes for standards making and spectrum harmonisation are open and transparent and we note that the CEPT's roadmap for new harmonising measures for SRDs and RFIDs includes two public consultations. We encourage stakeholders to participate in these processes if they wish to see specific technologies considered by CEPT and ETSI.

2.35 When Ofcom consults in Q4 this year our focus will on the appropriate technical amendments to the Interface Requirement (IR 2030) for Licence Exempt SRDs. This further consultation will take full account of the outcome of the European processes in ETSI and the CEPT and we will consider adopting additional national measures if there is evidence that the European processes do not permit the efficient use of the spectrum.

2.36 Further information on international processes and developments is given in annex 1 of this statement.

Options for releasing spectrum

2.37 We examined the options for the release of the bands in our consultation. In our analysis we considered:

- licence exemption, with the expectation of aligning UK technical conditions with those to be recommended by CEPT;
- individual licensing; probably national in scope, to use the spectrum at a higher power level than permitted by licence exemption; and
- a 'light licensing' regime, where users of a band are awarded non-exclusive licences which are typically available to all and are either free or only have a nominal fee attached to them.

2.38 Most of the responses agreed with our proposal that the bands 870-876 MHz and 915-921 MHz should be released on a licence exempt basis and the CEPT's harmonising measures adopted for these bands; so long as they include sufficient technical constraints to permit the efficient use of the spectrum and are based on the principles of application neutrality. However, Arqiva, the JRC and one confidential response made alternate proposals.

2.39 In its response, **Arqiva** said Ofcom should, for now, allocate the 870-876 MHz band exclusively to the HAN because it is the most pressing, high value use for this

[17] The outcome of this WI-41 is ECC draft Report 200.

spectrum. This view was supported by the **Federation of Communications Services (FCS)**.

2.40 The **JRC**'s response:

- highlights the importance [imperative] that this spectrum is put to productive use as quickly as possible;
- notes that there is an element of risk in releasing spectrum for licence-exempt use in that, once authorised, it is very difficult to reverse or tighten control if subsequent events make that desirable;
- highlights the importance of securing safety critical services such as ER-GSM;

and offers a 'middle way' in using the light licensing process outlined in the consultation. The JRC said that light licensing would enable use of the band at an earlier date, but the licensee could assume obligations to maintain records in order that any interference reports could be investigated and, if necessary, remedied. The JRC said that light licensing would enable early use of the band in the UK, followed by the removal of the light licensing regime to be replaced by a complete full licence exempt regime at a later date if subsequent European harmonisation facilitated such a move.

2.41 One confidential response suggested some benefits in awarding an individual licence, probably national in scope, and potentially using the spectrum at a higher power level than permitted by licence exemption.

Our response

2.42 We have carefully considered the option for allocating the 870-876 MHz band (or a part of it) exclusively for HAN applications and the potential for incompatibility between high and low-power licence exempt uses. We have also carefully considered the JRC's proposal for a 'middle way' and light licensing to facilitate early release for HAN use and the protection of ER-GSM.

2.43 With respect to HAN applications, the co-existence studies[18] that have been undertaken indicate that the CEPT channel plan and technical parameters for SRDs using the band 870-876 MHz will address HAN compatibility with other SRD uses and with GSM-R and ER-GSM. For this reason we do not think that allocating the bands exclusively for HANs, even in the short-term, is needed. We also expect that SRD equipment will be placed on the market and freely circulated throughout Europe and therefore any attempt to allocate exclusively for HAN applications in the UK would not be effective in practice.

2.44 With respect to light licensing, we said in our consultation that the types of systems now envisaged by the CEPT studies include a number of mitigation or politeness techniques. These techniques can diminish the coordination distance or the time interval of any interference. In view of the increased scope to address the risk of interference, our view is that there is no longer a case for light licensing for all SRD and RFID uses, as opposed to licence exempt use. Nonetheless, a light licensing

[18] See pages 74 to 84 (Section 5) of the draft ECC draft Report 200.
http://www.cept.org/files/1051/Tools%20and%20Services/Public%20Consultations/2013/Draft%20ECC%20Report%20200.docx

approach could in principle be considered in the future for additional 'overlay' higher power, longer duty cycle applications if there were a demand for these that was not permitted by the technical parameters for licence exempt use.

2.45 We will consider these points further when we consult on the technical details of how to implement our decision to licence exempt the 870-876 MHz and 915-921 MHz bands.

2.46 With respect to individual licences we received only one (confidential) proposal that supported a requirement for a national licence for vehicle-based mobile broadband services. However, our conclusion remains that the value of the 870-876 MHz and 915-921 MHz bands for national mobile broadband services is likely to be greatly limited because:

i) these bands are not harmonised internationally for mobile broadband use, and

ii) technical constraints on the spectrum would severely limit the power at which it could be operated.

2.47 In addition, since we anticipate a Europe-wide adoption of licence exemption for this spectrum, based on a CEPT recommendation, a licensed approach would also face issues of interference from equipment roaming from elsewhere in the EU. Stakeholders interested in developing technologies for the 870-876 MHz and 915-921 MHz bands may therefore wish to consider introducing these through the European processes for standards making and spectrum harmonisation so that they are taken into account through these processes.

Licence exempt approach

2.48 As noted above, most of the responses we received agreed with our proposal that the bands 870-876 MHz and 915-921 MHz should be released on a licence exempt basis. The key points expressed in relation to this proposal were:

i) There was a widely held view (evidenced in responses to our consultation by SCF Associates Ltd for example[19]) that the UK economy and consumers will benefit from releasing these bands for a wide range of SRD uses, but especially for machine-to-machine uses and in particular for smart metering, provided this can be achieved based on the principles of application neutrality and the efficient use of spectrum.

ii) Some responses noted that there are some SRD technologies emerging through standard-making bodies that may not have been considered, or considered fully, by the European processes or our national process. This point is discussed further above (under International developments).

iii) Several responses highlighted the importance of consulting further on the technical details of the appropriate amendments to the Interface Requirement (IR 2030) for Licence Exempt SRDs.

iv) Some responses indicated that we should still release the 872-876 MHz and 917-921 MHz bands even if the bands 870-872 MHz and 915-917

[19] http://stakeholders.ofcom.org.uk/binaries/consultations/870-915/responses/SCF.pdf

MHz are not released by the MOD to Ofcom (although this is no longer relevant given that release of these bands has now been confirmed).

v) There was some support for Ofcom releasing the spectrum as soon as practical, on the timescales we set out, or even earlier.

2.49 All the above points are consistent with our proposed approach. Further, a licence exempt approach will allow a range of potential uses we have previously identified, and the many more identified in the responses to our consultation, to access these bands. Indeed it appears likely that a licence exempt approach would be consistent with most or all of the major potential uses of the bands.

2.50 Therefore, with the decision by the MOD, endorsed by the UKSSC, to release the 870-872 MHz and 915-917 MHz to Ofcom, the overwhelming support for our proposal to licence-exempt these bands and the progress made by the CEPT with a channel plan[20], we have decided that the bands 870-876 MHz and 915-921 MHz should be released on a licence exempt basis.

Other issues arising from the responses

2.51 Although not a general theme of the responses, Telefónica's response does identify a residual concern for ensuring that the actual interference impact of SRDs into GSM900/UMTS900 continues to be monitored; and ask Ofcom to confirm what monitoring / study activities it plans to undertake to assess the interference impact of SRD deployments going forward; and Great Circle Design questioned the veracity of SEAMCAT for modelling.

2.52 Ofcom has not yet considered whether monitoring SRD deployments will be needed, but we will seek evidence for this when we hold a further consultation in Q4 this year. At the same time we will seek views on the validity of SEAMCAT analyses, how this might impact on the conclusions drawn by the CEPT in Report 181 and whether we should consider adopting additional national measures in our regulations if there is evidence that the European studies do not lead to an efficient use of the spectrum.

The rest of this document

2.53 Section 3 covers our next steps. In Annex 1 we summarise the response to each of the questions posed by our consultation. In Annex 2 we give further information on the progress in the international radio-technical fora and Annex 3 summarises the legal and regulatory framework.

[20] The CEPT's channel plan is based on principles that should ensure that it is as application neutral as possible, while having sufficient technical constraints to permit the efficient use of spectrum. See CEPT Report 44 http://www.erodocdb.dk/Docs/doc98/official/pdf/CEPTREP044.PDF and is based on the ECC Report 181 http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP181.PDF

Section 3

Next Steps

3.1 First, we note that there are potential significant benefits in making this spectrum available in a timeframe that is consistent with the Smart Meter Implementation Programme, with mass roll out of smart meters expected from late 2014.

3.2 Second, the details of the CEPT recommended position will not be finalised until Q1 2014 although there will be progressively more certainty about the CEPT's harmonisation measures in the run up to that point. In particular, we anticipate that the CEPT will finalise any changes to Recommendation 70-03 in the autumn of 2013 and seek to approve these in January 2014. Given that there could be material benefits from aligning a UK licence exemption with that adopted in other CEPT countries, we will not implement the UK regulation until the CEPT position is clear.

3.3 Third, we are now clear that the 2x2 MHz of spectrum at 870-872 and 915-917 MHz which was managed by Government, can also be released with the 2x4 MHz of spectrum at 872-876 MHz and 917-921 MHz.

3.4 Taking these factors into account, our subsequent steps will be:

- a further consultation on the technical details of implementing licence exemption for 870-876 MHz and 917-921 MHz in the UK in (calendar) Q4 this year. This would be timed to take into account both CEPT reports, ECC Report 189 and the SE24 Report, following their completion;
- a statement on the technical details of UK implementation together with a Notice of draft regulations that implement the licence exemption in Winter 2013/4; and
- make the exemption regulations in Spring 2014.

3.5 Our current timetable is summarised below.

Table 1.1. Our current timetable

	Date
Consultation on technical details of exemption	(calendar) Q4 2013
Publish Statement and Notice of draft regulations	Winter 2013/4
Make regulations	Spring 2014

Test and development licences

3.6 In the time up to the implementation of release in 2014, the spectrum will continue to be available for non-operational uses. Non-operational licences aim to promote the development and trialling of innovative uses of the radio spectrum in the UK, including the testing, development, trials and demonstration of radio equipment. They

do not allow commercial use. This licensing may be particularly relevant in this case given that the spectrum is largely unused at present and because there are new applications (as discussed in this consultation) that might benefit from development and trialling ahead of the spectrum being released. We will therefore continue to make non-operational licences available for the 870-876 MHz and 915-921 MHz bands.

Annex 1

Summary of Responses

A1.1 We received 27 responses to our consultation[21]. Of these, three were either confidential or included separate confidential responses and we have not published these.

A1.2 In this annex we summarise the responses to each of the questions we asked in our consultation.

Question 1:

A1.3 We asked: 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.

A1.4 In their response **Analog Devices, Inc**., helpfully identified progress in various standards-making bodies and the extent to which work is ongoing investigating the potential effects of LTE adjacency to the 870-876 and 915-921MHz bands. They identify that license-exempt ISM-focused products should find the band to be ideal and that license-free spectrum, which provides for higher transmit power and higher data rates has seen considerable success in other areas of the world, for example in the US, Australia, and Japan. They also identify that sub-GHz wireless mesh technology can provide means for IP-based wireless applications and extend the plausibility of the "Internet of Things"

A1.5 **Arm Holdings** in its response, welcomes the release of unlicensed spectrum to help stimulate the development of machine to machine connectivity, including Internet of Things, Arm Holdings says that the release has huge potential to deliver benefits in a variety of fields including: smart energy, remote health monitoring, smart cities etc., and that the UK has a chance to help lead the way through its decision on spectrum release.

A1.6 **Arqiva** highlights the UK Government's position and plans that have been announced by DECC for rolling out smart meters across Great Britain. Arqiva's response refers to DECC's view that it does not expect access to the 2.4 GHz band will meet the needs for 30% of homes for smart metering and that the most credible spectrum solution is the 870-876 MHz band for the Home Area Network (HAN). Arqiva supports the view that nothing should be done to preclude this solution, which it says is a priority for this spectrum.

A1.7 In addition, Arqiva says that Ofcom needs to consider the impact on other spectrum releases announced by Government[22] if smart meter HAN cannot operate in the 870-876 MHz spectrum.

A1.8 **BT** confirms that Ofcom has correctly identified all relevant developments for consideration in this consultation, but identifies that many of these developments

[21] http://stakeholders.ofcom.org.uk/consultations/870-915/?showResponses=true

[22] http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm121129/debtext/121129-0001.htm#12112958002050

are actually "work in progress"; and therefore that the full implications of these cannot be assessed at present.

A1.9 **Cambridge Silicon Radio (CSR Plc)** helpfully provides a very detailed commentary on many aspects of our consultation, but especially on value for UK citizens and consumers that might flow from licence-exempt use and on specific aspects of the international technical studies. CSR supports the specific inclusion of Spread Spectrum technologies; and sees significant potential particularly in low power, long range and low data rate applications.

A1.10 In its response, the **Department for Transport** seeks comprehensive consideration to putting the necessary controls into place for licence exempt applications to operate without interference to railway operations.

A1.11 **E.ON** endorse the submission from Energy UK to our consultation and the view that the availability of spectrum is very important to the operational efficiency of their smart metering roll out programme.

A1.12 **Energy UK** say that they strongly believe that if Smart Metering were additionally able to make use of the 870 –876 MHz bands through these being released for licence exempt for SRD applications, rollout of smart metering would be more effective.

A1.13 The response from the **Federation of Communications Services (FCS)** highlights that the 870-921MHz band could well represent a potential opportunity to derive considerable value for the UK with the deployment of SRD, RFID and later, ER-GSM or other replacement mission-critical or safety-related radio communications providing suitable arrangements for joint occupancy can be defined. It also makes clear that one of the most challenging considerations involved in the opening the band could be the specification of interference control mechanisms, especially because interference avoidance measures may themselves be the cause of inefficient use of spectrum if specified in a sub-optimal way; whilst trying to balance this against the priority of any rail applications that are deployed.

A1.14 The FCS further notes the recent work from DECC indicating the high value of HANs in their role as a critical part of the smart metering policy objective.

A1.15 **Great Circle Design** says that there is now a greater understanding of sharing arrangements between SRDs and references ECC Report 181[23], but casts doubt on the validity of some results from SEAMCAT[24] simulations and urges caution when using this tool as a basis for spectrum planning.

A1.16 The response from **Intellect** highlights several independent marketing reports predict considerable market growth for both RFID and SRDs applications including many of those mentioned in other responses, but also highlights Assistive Listening Devices (ALDs), new Social Alarms and Alarms.

A1.17 The value of opening the 870-876 MHz and 915-917 MHz band for both RFID and SRDs applications including many of those mentioned in other responses, but also Assistive Listening Devices (ALDs), new Social Alarms and Alarms is highlighted

[23] http://www.erodocdb.dk/doks/filedownload.aspx?fileid=3906&fileurl=http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP181.PDF

[24] http://www.seamcat.org/

other responses including **Qualcomm's**, which identifies the need for the CEPT's plans to include the IEEE 802.11ah bandwidth requirements and power limits.

A1.18 **Intellect** says that it is expected that the current designations of spectrum for RFID and SRDs will be inadequate to meet their future needs and that a designation of 870-876 MHz and 915-921 MHz to RFID and SRDs should help to meet the demand from a number of industries over the next 10-15 years.

A1.19 Intellect also highlights the UK Government's plans and the obligations placed on energy suppliers to complete the GB-wide rollout of smart meters by 2019 and notes that smart metering is "expected to have a £6.7 billion NPV benefit to UK"'. It supports the view that Ofcom should ensure suitable technical conditions for the proper operation of the HAN in 870-876 MHz on a long term basis and ensure that licence-exempt applications being considered by CEPT, including those for smart metering, SRDs and RFID are not delayed by other requirements such as those for ER-GSM.

A1.20 The **JRC** in its response highlights the increasing communication demands faced by utilities as recognized in the European Radio Spectrum Policy Programme (RSPP)[25]; and the requirement to make spectrum available for wireless technologies with a potential for improving energy saving and efficiency of other distribution networks such as water supply, including smart energy grids and smart metering systems.

A1.21 The **Met Office** identifies its use of the 915-917 MHz band for wind profiling radars (WPRs) and the need for access to a wider bandwidth for new WPRs.

A1.22 **FCS Associates Ltd** generally agree with the conclusion of ECC Report 181 and says that the technical details of implementation should be left for a later consultation.

A1.23 **Silver Springs Networks (SSN)** said that our consultation provided a comprehensive and balanced narrative on the work that has gone on within CEPT since Ofcom last consulted on these bands, but makes further points, which are summarised below:

- the extent to which the bands are used throughout Europe suggests their potential for exploitation for fixed applications (that cannot be 'accidently' carried into other jurisdictions' territories);
- compatibility between license exempt uses and licensed services (including LTE and E-GSM-R). The spectrum will be attractive for an operator of traditional communications services, but ideal for licence-exempt applications;
- Europe lacks a UHF licence-exempt band equivalent to the highly successful 902-928MHz band where, in many parts of the world, higher transmit powers are permitted. These bands are ideal candidates to fill that void for a range of applications including those for Smart Energy and wireless mesh for Smart Grid communications; and

[25] https://ec.europa.eu/digital-agenda/en/rspp-roadmap-wireless-europe

- implementation world-wide for Smart Grid applications using 902-928 MHz supported by harmonised standards[26] and the potential for the UK to benefit from the economies of scale that these standards are creating.

A1.24 The SSN response references the European Commission's, Information Society and Media Directorate-General, Electronic Communications Policy, Radio Spectrum Policy (Unit B4) recently published a study[27] to provide support for the preparation of an impact assessment to accompany the European Commission's Initiative on the Shared Use of Spectrum (SMART 2011/0017) as a source of information on the socio-economic value of shared spectrum access, including its impact on competition, innovation and investment.

A1.25 **Telefónica** said that Ofcom's analysis and proposals reduce and potentially remove the considerable residual uncertainty it has had over the potential future interference environment arising from this spectrum that is adjacent to the 900MHz mobile band and agree with the approach proposed in our consultation as a much more proportionate proposal than licensing the relevant band for a single national high power user.

A1.26 Telefónica's response mentions, in particular, that:

- harmonisation benefits are high;
- Ofcom can leverage the substantial technical analysis undertaken by CEPT when arriving at its proposals;
- the value of shared spectrum use for applications such as home access networks (HANs);
- future co-existence with ER-GSM is addressed; and
- co-existence with Telefónica's GSM900 and UMTS900 – that Ofcom's proposals to make this band available for shared low power use substantially reduce interference risks.

A1.27 Telefónica's response does identify a residual concern that relates to ensuring that the actual interference impact of SRDs into G900/U900 continues to be monitored; and ask Ofcom to confirm what monitoring / study activities it plans to undertake to assess the interference impact of SRD deployments going forward.

A1.28 The response from **Ultra Energy** fully supports Energy UK's consultation response regarding the use of the 870–876 MHz for GB smart metering HAN (Home Area Network) applications and agrees that 870-876 MHz should be released for SRDs and 915-921 MHz for RFIDs. The response highlights the various benefits for consumers in the use of 870–876 MHz band from smart metering (and HAN use).

A1.29 In its response **Vodafone** said that the use of 870-876MHz and 915-921MHz spectrum with appropriate technical parameters is essential to provide a cost-effective mechanism for providing data communications to energy smart meters.

[26] IEEE, TIA, ETSI and IETF standards quoted.

[27] https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/20120210_scf_study_shared_spectrum_access.pdf

A1.30 Vodafone also notes that in order to utilise this spectrum on release for smart metering purposes as part of a commercial proposition, an amendment to the established statutory instrument SI 2003/74 could additionally be required. Vodafone urges Ofcom to progress this amendment concurrently with other release activities to mitigate the risk of any delay in order to avoid cost impacts and to keep to the timeline proposed in the consultation, and in parallel to develop contingency plans to cope with the scenario of the CEPT output being delayed.

A1.31 **WHP Wilkinson Helsby** said that Ofcom had identified the majority of current and future developments at high level within this and previous Ofcom consultations. A long list of further specific applications and developments could be compiled but they could be adequately categorised under one of the machine-to-machine applications.

A1.32 Ofcom also received a confidential response that highlighted the need for spectrum from within the bands for high speed rail communications.

Question 2:

A1.33 We asked: whether 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.

A1.34 **Analog Devices, Inc** provide further information on the need to solve range and coverage issues; addressing link margins and providing sufficient contiguous bandwidth for interference avoidance techniques which can be placed in the higher layers of the protocol. They draw attention to new standards as a better means for addressing gas and water applications using spectrum below 1 GHz for protocols such as ZigBee. They also highlight developments in semiconductors that can now provide key features like Gaussian filtering and transmit power control (TPC), which in combination with other new techniques can provide cleaner and more efficient transmitters and more sensitive, robust and spectrally efficient receivers.

A1.35 **Arqiva's** response highlights a specific concern for harmful interference from high power applications to Home Area Networks that are based on ZigBee-868 MHz and says that Ofcom must demonstrate that allowing an alternative higher power use that precludes this service will deliver a greater benefit.

A1.36 Arqiva's analysis also highlights that if the HAN is not deployed in bands below 1 GHz, and instead is only working at 2.4 GHz, that 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.

A1.37 **Energy UK's** response to question 2 focuses on smart metering and the increased coverage, capacity and interference immunity for the Home Area Network system that using 500mW rather than 25mW transmit power might bring if it were made available in the right timescales and with the right spectrum access rules.

A1.38 The **FCS's** response highlights that its members have differing views, but does note that DECC have recently produced information in relation to smart metering. In particular we note that the FCS concludes:

- That Ofcom should allocate the 870-876 MHz exclusively to the HAN and says that this is the most pressing, high value use for this spectrum.

- The HAN is of critical importance to the success of the whole smart metering project and that because licence exemption decisions are unlikely to be easily reversible the correct decision must be made at the first attempt.

- In light of the consumer benefits of the HAN identified by DECC, Ofcom should ensure it is allocated sufficient radio spectrum to ensure that the specific quantified benefits of the Smart Metering programme can be realised.

- 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.

A1.39 The response from the **JRC** highlights European Utility Telecom Council (EUTC) study on "The Socio-Economic Value of Radio Spectrum used by Utilities in support of their operations; January 2012[28]" and that this analysis supports that part of the consultation which proposes designating this spectrum for use in intelligent energy networks.

A1.40 **Robert Bosch GmbH** highlight the importance of applications like alarms and social alarms and that these have a higher socioeconomic value than others (like e.g. remote controls, gaming purposes, non-critical data transfer) because it deals with safety of human life aspects.

A1.41 **SCF Associates Ltd** have provided a very comprehensive and detailed economic case for smart metering and an analysis of the socioeconomic benefits that could be derived from a wide range of SRD applications and RFIDs from the release of the 870-876 MHz and 915-921 MHz bands. Their response also identifies a 'future vision' that includes Metropolitan Mesh Machine Networks and M2M.

A1.42 SCF Associates Ltd say that their analysis is in line with previous valuations of unlicensed spectrum, which far exceed the value of licensed spectrum; and that the number of intelligent connected devices is likely to exceed 100 billion by 2020, potentially generating an economic contribution of more than $1.4 trillion per year — five times greater than the Internet today.

A1.43 **SSN's** response to question 2 provides some quantification of the likely scale of the benefits of making this spectrum available immediately to the energy sector and highlights independent evidence for this[29], but it also highlights a demand for higher power licence-exempt sub-GHz spectrum.

A1.44 **WHP Wilkinson Helsby** response uses the examples of Smart Grid and Smart Metering to demonstrate that without the availability of this spectrum it is possible that UK consumers could either be denied access to Smart Grid technology (resulting in higher energy bills) or charged for the implementation of a more expensive, non-ideal technology solution and that the UK would be competitively disadvantaged if access to this spectrum is not made available.

[28] http://jrc.co.uk/sites/default/files/Socio-economic%20value%20of%20Spectrum%20used%20by%20utilities-v1.1.pdf

[29] The economic value of licence exempt spectrum, Aegis and Ovum, December 2006 (http://www.aegis-systems.co.uk/download/1818/value.pdf)

Question 3:

A1.45 We asked: whether 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.

A1.46 **Analog Devices, Inc**. agrees with this proposal and supports this with its view that 12 MHz would be enough for good interference avoidance, collocation strategy and channelization options for higher data rates. Analog Devices, Inc. also says that releasing 12 MHz would not put restriction on a choice of system architecture: Mesh, tree or star systems would benefit from the additional spectrum and take full advantage of the three modulation options described in an ETSI technical standard[30].

A1.47 **ARM Holdings** agrees with our proposal and says that RFID for asset tracking ideally should be a globally harmonised approach to facilitate logistics tracking and widespread use. Short Range Radio is interesting in this band as 800MHz gives nice propagation characteristics (e.g. goes through walls etc) and so will reduce the overall cost of deployment for unlicensed short range devices.

A1.48 **Arqiva** says that it is important to know what services will be deployed in the 870-872 MHz 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. Arqiva says that 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 and so should not be allowed.

A1.49 Therefore until the technical issues are resolved Arqiva says that Ofcom should allocate this spectrum in a way that ensures that the HAN can operate in this spectrum. Arqiva also says that 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.

A1.50 **JRC** highlights the importance of spectrum to support smart grid technologies and that this will require a range of solutions, supported by a mix of radio frequencies, powers and bandwidth. JRC also highlights that the European Utilities Telecom Council (EUTC)[31] has identified a portfolio of spectrum to meet these requirements:

- VHF spectrum (50-200 MHz) for resilient voice comms & distribution automation for rural and remote areas. [2 x 1 MHz]
- UHF spectrum (450-470 MHz) for SCADA & automation. [2 x 3 MHz]
- Lightly regulated or deregulated shared spectrum for smart meters and mesh networks (870-876 MHz).
- L-band region (1500 MHz) for more data intensive smart grid, security and point-to-multipoint applications. [10 MHz]

[30] TS 102 887 -1 is cited.
[31] http://www.eutc.org/

- Public microwave & satellite bands (1.5-58 GHz) for access to utilities' core fibre network or strategic resilient back-haul.

A1.51 The JRC says that within this portfolio, 870-876 MHz constitutes a block of spectrum for smart meters and certain smart gird functions and that using licence-exempt spectrum provides a valuable communications technique without consuming scarce and more valuable licensed high power spectrum. The JRC supports releasing the band for licence-exempt or light licensing and the exploitation of a currently underutilised natural resource.

A1.52 The **Met Office** says in summary that it cannot yet fully envisage how a license-exempt regime will provide sufficient assurance of the ability to protect our existing WPR use from harmful interference and thus believe at this time that some form of licensing regime would be preferable in respect of maintaining a suitable separation distance. However, we welcome further discussion with Ofcom in order to scope the facilitation of this requirement.

A1.53 **SCF Associates** Ltd. agrees with our proposal, but says that the primary questions are:

- are these the best uses of these bands?
- can they coexist with ER-GSM, in the 873-876 and 918-921 MHz ranges?

A1.54 SCF Associates says that ER-GSM might only be needed in a few large switching centres and along the high-speed rail line to continental Europe and suggests that co-existence with ER-GSM should not be a decisive test for the 'deployability' of SRDs and RFID throughout the UK.

A1.55 **SSN's** response also highlights that the bands have lain fallow for too long and goes on to identify a number of sectors that would benefit from the release of 2x6 MHz.

Question 4:

A1.56 We asked: if 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.

A1.57 Analog Devices, Inc. agrees that some spectrum is better than none, but notes that this is a 33% reduction in the release and that there may be technical ramifications regarding a need for higher co-channel rejection, given this scheme. Analog Devices Inc. says that while there is possibly the consequence of a relaxed low-end Adjacent Channel Rejection (ACR), there is, likewise, a possibility of even more stringent limits on Adjacent Channel Power (ACP) and phase noise, for example.

A1.58 In the event that this option is pursued, Analog Devices would like to understand the Government's technical basis for not releasing the spectrum. If, for instance, there are major differences in the speed and ease with which 8 MHz can be released versus the full 12 MHz, then Analog Devices more favourably implores this approach, especially if the 8MHz release is a true stage in an overall plan where the entire 12MHz is ultimately released.

A1.59 **Arqiva** says that it is important to know what services will be deployed in the 870-872 MHz band in order to ensure that there is no harmful interference to the

adjacent services; particularly to HAN. Until the technical issues are resolved Arqiva says that Ofcom should allocate this spectrum in a way that ensures that the HAN can operate in this spectrum. Arqiva also says that 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.

A1.60 **Energy UK** agree that 872-876 MHz should be allocated for licence exempt SRDs and 917-921 MHz for RFID, but they would prefer the scenario of the full 6 MHz becoming licence exempt.

A1.61 The **FCS** considers that whilst it is obvious that the denial of 2x2MHz from the overall opportunity would be disappointing, the remainder still represents a worthwhile amount of spectrum that might provide considerable value.

A1.62 However, The FCS does note that the loss of the government 870-872MHz // 915-917MHz segment means that the proportion of radio spectrum that must be heavily protected in the event that ER-GSM is deployed is correspondingly greater; and that this could affect services that would employ a back-off strategy, treating parts of the overall range differently. The FCS considers it likely that areas of the band where ER-GSM will not be deployed could have lesser interference mitigation requirements than those areas where ER-GSM may be deployed in the future. The services that could be supported in those bands could well be different.

A1.63 In its response to question 4 **Intellect** says that Ofcom should ensure that the technical conditions set for systems using the MOD bands (870–872 MHz and 915–917 MHz) are consistent with the proper operation of smart metering applications, SRDs and RFID systems across the entire (two) bands.

A1.64 The LPRA says that if the bands 870-872 MHz and 915-917 MHz are unavailable, they would nevertheless support the release of the bands 872-876 MHz and 917-921 MHz to SRDs/RFID. At the same time it should be realized that this restriction will reduce the benefits that can be gained by the use of this spectrum.

A1.65 In its response **SCF Associates Ltd**. says that the extra 2 MHz at 870 MHz and at 915 MHz is most useful but does not eliminate the value of applications likely to come to market in the remaining spectrum although SCF Associates Ltd. notes that the promised benefits of new applications on licence exempt bands could be reduced if less spectrum were made available.

A1.66 **SSN's** response confirms that the technologies under consideration by CEPT for operation in the band are capable of sharing co-channel with one another and although not releasing the lower 2 x 2 MHz spectrum would be less than ideal, much of the benefit of the spectrum would still accrue.

Question 5:

A1.67 We asked: whether 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

A1.68 **Analog Devices, Inc.** favours Ofcom moving quickly and that they believe that releasing the full spectrum now will provide the UK and Europe with a strong option that is consistent with successful deployments in other regions. Rapid release will provide more time for the assignment and completion of critical work around coexistence and interoperability.

A1.69 **Arm Holdings** is open-minded, but says that speed is important if the UK is to seize an opportunity lead the way in this area.

A1.70 **Arqiva** says that there are still significant uncertainties and unresolved issues relating to the 870-876 MHz spectrum and list these.

A1.71 Given this uncertainty described above, Arqiva says that, at this stage Ofcom should allocate the 870-876 MHz band exclusively to the HAN and that doing so has the added advantage that it also allows the 915-921 MHz spectrum to be allocated for RFID.

A1.72 Arqiva's view is:

- that 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; and

- 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.

A1.73 **Mr N Bolton** says that the sooner the better, for the purposes of leveraging commercial and technical benefit through technology exploitation in this field of rapidly developing opportunities.

A1.74 In its response **BT** says that whilst it is understood that it is premature to try to conclude on the details of the operating parameters, they would support the proposal from Ofcom that:

- The lower band (870 / 872 – 876 MHz) is identified in principle for smart metering Home Area Networks (HAN), as a short range (i.e. low power), very low duty cycle application, and

- The upper band (915 / 917 – 921 MHz) is identified in principle for RFIDs.

A1.75 BT also say that they would support Ofcom continuing to engage with the appropriate bodies (CEPT, ETSI, DECC and MoD) to resolve the outstanding questions, and to develop appropriate regulatory measures in accordance with the provisional timetable laid out by Ofcom in the consultation document.

A1.76 **Energy UK** says that they are happy with the proposed for technical details of the exemption to be consulted on by autumn 2013. In order that the equipment can be available for Smart meter rollout we would not like to see it slip much beyond that.

A1.77 The **FCS** proposes that the release time-scale be developed around the creation of suitable, mitigation strategies for this band. If this matter is left unresolved, no one can place any realistic values on the services that can be supported except for those services that, by their very nature, are expected to be able to tolerate interruptions which may be of significant duration.

A1.78 In the likely event that a suitable interference avoidance specification is not forthcoming, the FCS proposes that the policy is re-considered. In the meantime, important deployments are considered on a case-by-case basis.

A1.79 **Intellect** notes a range of uncertainties relating to the 870-876 and 915-921 MHz spectrum bands that Ofcom identified including the planned MoD decision on the future use of 870-872 MHz and 915-917 MHz spectrum, the anticipated CEPT/ECC technical recommendations in autumn 2013, and DECC's HAN strategy in Spring 2013.The timing of these is unfortunate, but Intellect says that Ofcom's strategy can be made contingent on CEPT agreeing spectrum access conditions that are consistent with smart metering applications, including ensuring suitable operating conditions for the HAN and Ofcom should also engage proactively in CEPT to ensure this.

A1.80 Intellect mention that some of its member companies believe that ideally Ofcom should allocate 870 -876 MHz and 915-921 MHz to both RFID and SRDs as soon as possible and identify that there is a clear demand for this spectrum for these services and the value to business will be very high. Intellect refer to the CEPT's roadmap towards a spectrum allocation for SRDs and RFIDs for the bands 870-876 MHz and 915-921 MHz and that it is expected to be compatible with the existing Government and public sector uses. Intellect say attention should be paid to the potential interference potential between RFID and SRD systems and one possibility being considered in CEPT is for RFID applications to be facilitated in the 915–921 MHz band only.

A1.81 Intellect to the studies to identify sharing conditions for both intra and inter-services are in progress in ECC and CEPT fora such as CEPT WG SE 24 and says that in the absence of an EU mandate to CEPT, any reports and conclusions will not be binding on member states. Intellect says Ofcom should continue to engage closely with these studies with a view to ensuring that UK perspectives are properly addressed. When authorising the use of the band, Intellect says Ofcom should ensure that that UK candidate applications (including HAN and WAN) are not precluded.

A1.82 **JRC** says in response to question 5 that because of the Government's intentions on smart meter roll-out, and the energy policy objectives driving forward smart grid deployment, it is imperative that this spectrum is put to productive use as quickly as possible. However, the consultation recognises that there may be issues with access to the spectrum for ER-GSM, and that the timetable for European harmonisation might not align with UK timescales.

A1.83 JRC also notes that the consultation recognises that there is an element of risk in releasing spectrum for licence-exempt use in that, once authorised, it is very difficult to reverse or tighten control if subsequent events make that desirable.

A1.84 JRC says that if this situation should become an impediment to rapid progress in the UK, there might be a 'middle way' in using the light licensing process outlined in the consultation, but rejected for various reasons. Light licensing would enable use of the band at early date, but the licensee could assume obligations to maintain records in order that any interference reports could be investigated and, if necessary, remedied. JRC says that this may be especially important in relation to the introduction of safety critical services such as ER-GSM.

A1.85 JRC suggests that a light licensing approach would enable early use of the band in the UK, followed by the removal of the light licensing regime to be replaced by a complete full licence exempt regime at a later date if subsequent European harmonisation facilitated such a move.

A1.86 **The LPRA** supports the sequencing and timing proposed by Ofcom for the planned release of the spectrum to SRDs/RFID for license exempt use. The LPRA says that these fit well with the timings in the CEPT roadmap covering this topic in ECC and the plans for the completion of revisions to existing ETSI standards for SRDs/RFID.

A1.87 The **Met Office** says that depending on the form of mitigation required in order to protect Met Office WPRs, a sufficient lead time should be provided for in implementation of new regulations to ensure continued operation. The Met Office reserves its position in terms of the proposed spring 2014 implementation date in view of the need to finalise discussions with Ofcom on conditions for mitigation and use of the band.

A1.88 In its response to question 5 **SCF Associates Ltd**. say that it is most important not to let the schedule proposed in Table 1.1 of the consultation document slip. Indeed, they say it should be accelerated if possible. SCF Associated Ltd note that this spectrum has been under-utilised for more than a decade and that the benefits foregone – and opportunity cost incurred – are huge. SCF Associates Ltd say that had the spectrum been released earlier, vast amounts of societal value could have been unlocked in the areas of smart metering and the other smart applications described in this response and that further delay or deliberation regarding this band will postpone the innovations that will surely occur by exploiting 870 / 915 MHz.

Annex 2

International processes and progress

A2.1 In this annex we provide some further insight into the progress currently being made toward harmonisation of the 870-876 MHz and 915-921 MHz bands for SRDs and RFIDs.

CEPT

A2.2 There are two work streams within the CEPT that have been working towards an allocation for SRD in the bands 870-876 MHz and 915-921 MHz:

- WGSE have a work item to develop the technical compatibility analysis, providing guidance on the technical parameters necessary to ensure there is a low probability of interference to primary services both in-band and adjacent to this spectrum. This is Work Item 41 (WI-41). WI-41 was started in 14/10/2011 and is scheduled for completion on 02/09/2013. The outcome of this WI-41 is ECC Report 200.

- WGFM have a work item to develop an ECC Report detailing the demand for spectrum access and developing a firm proposal for the allocation of SRD in the bands 870-876 MHz and 915-921 MHz. This second report is dependent on the outcome of the WI-41 Report.

A2.3 There is a project plan to deliver a European Recommendation for SRD in the bands 870-876 MHz and 915-921 MHz in Q2 of 2014.

A2.4 Since the publication of our consultation, there have been significant developments in the CEPT work streams. WGSE Project Team WGSE PT24, have met three times (7-8 January 2013 Dublin, 12-14 March Karlsruhe and 22-24 April Helsinki). They have also held several electronic virtual meetings to complete the final draft and to ensure the project plan remains on schedule. The draft ECC Report 200 has developed from version 16 to version 20 over this period. The draft report was approved for public consultation by WGSE on 17 May 2013.

A2.5 Following the completion of the technical compatibility analysis within the final draft of ECC Report 200, WGFM have on 24 May 2013 endorsed the plan to develop proposals for SRD spectrum allocations in the 870-876 MHz and 915-921 MHz band. These proposals are to be based on the principles set out in CEPT Report 44 and as such should be as application neutral as possible, while having sufficient technical constraints to permit the efficient use of spectrum. These proposals will be published in ECC Report 189.

A2.6 By agreeing the draft ECC Report 200 for public consultation, WGSE have ensured the CEPT project remains on schedule. For the subsequent stage of the project, the first draft of the ECC Report 189 will be discussed at a WGFM sub-group (SRDMG) meeting on 21 June and approval of the final draft for public consultation is envisaged at the October meeting of WGFM.

ETSI

A2.7 The technical specification for the physical characteristics of smart metering, were published late in 2012. For other SRD technologies these technical specifications

have been known for much longer. However, it is envisaged by all relevant industry sectors that Harmonised Standards (HS), as listed in the official Journal of the EU (EUOJ), will need to be developed. There are a number of New Work Item (NWI) requests for new HS that are likely to be approved at the June 2013 ETSI ERM TG28 meeting. The development of these HS has also been dependent on the delivery of the draft ECC Report 200 proposals.

Annex 3

Legal and regulatory framework

A3.1 We set out in Section 2 and Annex 7 of the 2009 consultation the regulatory and spectrum management framework within which our decision on the approach to release of the spectrum will be made. Those sections explained the duties applicable to Ofcom's decision making process, and Ofcom's regulatory principles.

A3.2 In particular, we referred to Ofcom's powers under the WTA to grant licences for wireless telegraphy and also to make regulations exempting the establishment, installation or use of wireless telegraphy stations or apparatus from the need for a licence. In relation to the making of exemption regulations the WTA provides:

- Ofcom may by regulations exempt such activities either absolutely or subject to such terms, provisions and limitations as may be so specified;
- Ofcom may not make regulations specifying terms, provisions or limitations in relation to the establishment, installation or use of wireless telegraphy stations or wireless telegraphy apparatus for the provision of an electronic communications network or electronic communications service unless the terms, provisions or limitations are of a kind falling within Part A of the Annex to Directive 2002/20/EC of the European Parliament and of the Council;
- Terms, provisions and limitations specified in regulations under 8(3) of the WTA must be (a) objectively justifiable in relation to the wireless telegraphy stations or wireless telegraphy apparatus to which they relate; (b) not such as to discriminate unduly against particular persons or against a particular description of persons; (c) proportionate to what they are intended to achieve, and (d) in relation to what they are intended to achieve, transparent; and
- In making exemption regulations Ofcom must be satisfied that the use of stations or apparatus described is not likely to: (a) involve undue interference with wireless telegraphy; (b) have an adverse effect on technical quality of service; (c) lead to inefficient use of the part of the electromagnetic spectrum available for wireless telegraphy; (d) endanger safety of life; (e) prejudice the promotion of social, regional or territorial cohesion; or (f) prejudice the promotion of cultural and linguistic diversity and media pluralism.

Licence Exemption

A3.3 Under section 8(1) of the WTA), it is an offence to establish, install or use equipment for wireless telegraphy without holding a licence granted by us, unless the use of such equipment is exempted. Ofcom is able to make regulations exempting the use of equipment by using powers conferred by section 8(3) of the WTA.

A3.4 Based on the responses received we have therefore decided to proceed with a second consultation on amendments to the licence exemption regulations to include SRD and RFID devices using the 870-876 MHz and 915-921 MHz bands. Following that second consultation the changes to the licence exemption will be implemented through making Wireless Telegraphy exemption regulations.

A3.5 However, because the CEPT studies are not yet finalised our second consultation will include proposals for the appropriate technical amendments to the Interface Requirement "IR 2030 - UK Interface Requirements 2030 Licence Exempt Short Range Devices" (IR 2030). The changes will be finalised when the regulations come into force.

Equality Impact Assessment

A3.6 Ofcom is required by statute to assess the potential impact of all our functions, policies, projects and practices on race, disability and gender equality. Equality Impact Assessments (EIAs) also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers regardless of their background or identity.

A3.7 The SRD family of technologies that could be implemented in the 915-921 MHz band includes Assistive Listening Devices (ALDs), which are used by citizens who are hard of hearing or partially deaf.

A3.8 ALDs enable citizens who are hard of hearing or partially deaf to hear speech and music. ALDs work by taking the speech or music, amplifying it by placing a microphone near the sound source and using wireless to transmit the sound to the listener.

A3.9 ALDs are used by both groups and individuals. Devices aimed at group use broadcast the sound to more than one person; examples include induction loop, infrared and frequency modulation (FM) systems. Devices designed for personal use are generally configured to work with a single speaker; examples include wireless personal FM systems and wireless headphones.

A3.10 Our decision to licence exempt the 870-876 MHz and 915-921 MHz spectrum is likely to bring increased access to ALD services and increase the choice of technologies and devices available to the hard of hearing or partially deaf because we are adding a further 2x6 MHz of spectrum to supplement what has already been made available for licence exempt services. We have seen no evidence that this decision will be detrimental to any other group of society. Neither have we seen any evidence that the introduction of a small exclusion zone to protect the Met Office's wind profiling radar, should it prove necessary, will have a detrimental impact on the benefits to citizens and consumers generally.