

Q1. Do you agree that regulations should be made to enable the licence exempt use of SRDs in the 870 to 876 MHz and 915 to 921 MHz frequency bands, in line with the amendment of ERC Recommendation 70-03?

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1 Our Recommendation

SCF Associates Ltd strongly supports the decision to allocate these frequencies to licence exempt use and recommends that this be carried out as soon as possible.

2 Our supporting rationale is based on the economic and social benefits

Our response to Ofcom's previous consultation on 870-876 MHz and 915-921 MHz¹ explained the reasons behind this recommendation. We presented evidence that significant social and economic benefits would flow from the licence exempt applications proposed for those frequencies, as demands for spectrum access are growing from industries which could contribute to the UK's prosperity.

In particular, spectrum is in strong demand for short range devices (SRDs). Using a short signal range reduces the risk of interference, making it possible to eliminate licence requirements while allowing frequency re-use by large numbers of devices. Large numbers of devices provide economies of scale, making communications technology affordable.

One of the most striking phenomena of recent decades is how much creativity is released when designers and entrepreneurs are free to develop applications not pre-defined by regulators. Allocating spectrum to specific and nonspecific SRDs, for a variety of uses is likely to be most advantageous. These applications include:-

- Management of electricity demand with 'smart grids' requiring wireless smart meters and data relay devices. This will enable far more efficient use of existing generating and distribution plant, cutting overall demand while increasing supply efficiency and reliability. In other countries where it has been rolled out, smart grids have cut peak demand by as much as 11% to 33%. Translating this to the UK, a minimal 3% cut in peak demand would enable the UK to avoid constructing 24 new mid-range power stations (as illustrated in our previous submission). Since April 2013, EU emission regulation has placed new limits on generation sources for the UK the electricity supply. According to the Chief Executive of Ofgem, the industry is forced under two European Directives to reduce total generating capacity from coal and oil-fired generating plants. This will progressively cut the surplus margin from 14% to 5%. In such circumstances the need for more reliable and efficient management of the electrical energy supply over the next decade will be increasingly critical to the UK economy. Moreover, a study by Ernst & Young (again cited in our response to last year's consultation) suggests that developing a "smart" nationwide electrical grid in the UK would yield significant benefits (£146 billion between now and 2050) by lessening fuel

¹ "Update and Way Forward" (23 January – 28 March 2013). Our response to that consultation is online at <http://stakeholders.ofcom.org.uk/binaries/consultations/870-915/responses/SCF.pdf>

price increases and preventing power blackouts while achieving the carbon reduction targets mandated by the EU². Our own previous submission also noted the impact of lowered fuel demand on fuel prices in the global market, creating a leverage effect in reducing the UK balance of payments.

- Unlicensed spectrum can trigger the next major advance for networking globally - machine-to-machine (M2M) communications, supporting innovation in applications, from wireless sensor networks to taming forest fires to pacemaker monitors that relay the vital heart signs to health carers. By 2020, the economic potential of M2M and the Internet of Things (IoT) could generate benefits of more than \$1.4 trillion per year³ globally as the number of devices connected reaches 100 billion. That economic contribution is 5 times greater than the Internet today. And because unlicensed technologies are cost-effective, power-efficient and robust, they are likely to provide over 95% of these IoT connections.
- Logistics and manufacturing increasingly depend on SRDs, be it for parts identification and tracking by RFID or for the automation of factory processes. RFID is likely to contribute the largest number of devices to these bands and some assert that it is the most economically productive use of spectrum.⁴
- For the automotive industries, SRDs are used for applications ranging from tyre pressure monitoring and proximity radars to in-car entertainment
- For the alarms market, SRDs for fire and intrusion detection are crucial assets as well as for social protection and personal safety, etc
- Wireless audio systems (assistive listening devices, wireless microphones) are today an important asset for individuals and the public entertainment industries
- Building automation systems for the control and monitoring of 'smart buildings' to manage energy consumption and other services is a new sector of development
- Looking to the future, we may anticipate an increasing category of "non-specific" short-range devices. This open-ended category allows for unanticipated progress in new directions. It is vital for new industrial development in the UK, because licence exemption encourages innovation. Indeed, that is one of the most important benefits of licence exempt regimes – the Wi-Fi 'industry' is one magnificent case in point.

Social needs and benefits also justify increased allocations of licence exempt spectrum for SRDs:-

² Ernst & Young, *Smart Grid: a race worth winning? A report on the economic benefits of smart grid*, SmartGrid GB (April 2012), available from <http://www.scribd.com/doc/94198144/Smart-Grid-A-Race-Worth-Winning-a-SmartGrid-GB-Report>

³ R. Thanki, "The Power of the Unlicensed Economy", July 2012 - <http://allthingsd.com/20120710/the-power-of-the-unlicensed-economy/>

⁴ Ofcom commissioned research by Indepen, Aegis and Ovum in 2006 which found that retail uses of RFID were likely to contribute about £620 million per MHz to the UK economy over the next 20 years, while broadcasting and mobile telephony would each contribute less than £30 million per MHz. See *The economic value of licence exempt spectrum* – <http://www.aegis-systems.co.uk/download/1818/value.pdf>

- To reduce emissions of greenhouse gases (GHGs) and total energy consumption, by integrating renewable energy sources (RES) while cutting the generating capacity required for the nation, responding to the EU Directives
- To support smarter cities and transport which are not only greener and more economically efficient but which enable new services to citizens, from 'joined up' emergency services to streamlined travel payments – eg London's Oyster card - which may all use SRDs, if permitted to
- Telecare of the elderly and infirm in sheltered housing, using forms of social alarm, that may be extended in the future to remotely managed healthcare in the home, robotics and safety devices.

In summary, there are strong economic and social arguments for licence exempt use of these bands.

3 Progress on authorisation over the year has modified the actual question being asked in the consultation

A year ago the question was:-

Should Ofcom authorise licence exempt use of 870-876 MHz and 915-921 MHz?

A positive answer seems to have emerged from the earlier consultation, leading to a more complex question:-

Can the diverse applications seeking to use these bands co-exist?

That second question is made challenging by:-

- The different bandwidths, power levels and duty cycles needed to implement each application
- The way each family of devices deals with interference;
- The presence of licensed activities in these bands (railway communications based on GSM-R and weather profiling radars).

CEPT has spent a year studying and debating these co-existence issues, finally producing two in-depth technical reports⁵ and a set of draft amendments to ERC Recommendation 70-03 (Relating to the use of Short-Range Devices).⁶ These documents contain viable solutions to the various contention problems. However, Ofcom's proposals differ from the CEPT recommendations on Network Relay Points (NRPs, also called Network Access Points, NAPs)⁷. The consultation document suggests that Ofcom might deny higher duty cycle NRPs authorisation altogether, which is not a CEPT recommendation:-

⁵ ECC Report 200 ("Co-existence studies for proposed SRD and RFID applications in the frequency band 870-876 MHz and 915-921 MHz") and draft ECC Report 189 ("Future Spectrum Demand for Short Range Devices in the UHF Frequency Bands").

⁶ <http://www.cept.org/files/1051/Tools%20and%20Services/Public%20Consultations/2013/Draft%20REC%2070-03.docx>

⁷ ECC Report 200 uses a different terminology, referring to NRPs as Network Access Points (NAPs) and noting that they "include various types of infrastructure devices that may be referred in various SRDocs and standards as gateway devices, Coordination Group devices, eBridges, relays, etc."

Paragraph 1.5: "...We will review whether we should permit higher duty cycle NRP devices to use the bands should evidence of demand for these support this".

This departure from the CEPT recommendations deserves a clearer explanation or reconsideration.

4 CEPT has examined NAPs/NRPs

ECC Report 200 explains: *"the nature of smart metering and smart grid applications may call for establishing a certain network infrastructure, i.e. a small number of access gateways to sink data collected from across various terminal nodes into fixed infrastructure maintained by a utility company. Due to acting as traffic aggregators, the activity on these nodes will be higher than on the terminal nodes. The industry therefore requested to define separate SRD device type that may be referred to as 'Network Access Point (NAP)' and described as follows:-*

*"Devices deployed by professional organisations, such as utilities, to support wider operations, and thereby restricted in their deployment. Such devices will not be made available to the general public/consumers."*⁸

*"Even Network Access Points (NAPs) with up to 10% DC may be easily accommodated in most typical coexistence situations, because their higher DC may be compensated by lower deployment figures. However, in the case of NAPs, there is a probability that the density may potentially be found to exceed assumptions, subject to market growth, spectrum access and competition issues. Therefore, some form of review mechanism should be considered as necessary, within the regulatory framework for SRDs with additional mitigation mechanisms, such as APC [Adaptive Power Control]..."*⁹

Draft ECC Report 189 also comments on the findings of ECC Report 200:-

*Such equipment [NAPs, which Report 189 calls NRPs] can be operated by various providers in the same metropolitan area. This means that it may be difficult to maintain the low deployment figure. To address this issue, one possibility may be to monitor the deployment of NRP. This possibility has been investigated and the result is that this could be done by defining a notification procedure as part of a general authorisation framework. However, such a registration process is difficult to implement and the efficiency of such procedures is not proven (see experiences on light licensing regime). If the situation becomes critical (maximum deployment figure is reached and the likelihood of interference increases significantly), it may be too late to introduce new restrictions in order to mitigate interference. Therefore, it is recommended that NRPs are subject to individual authorisations or alternative frequency opportunities*¹⁰

Here, issue may be taken with the claim that registration is *"difficult to implement and the efficiency of such procedures is not proven"*.

⁸ ECC Report 200, page 17.

⁹ ECC Report 200, page 4.

¹⁰ Draft ECC Report 189, page 43-44

Registration requires a regulator simply to receive and store information in case a problem arises. And should a problem arise, responsibility for finding a solution is usually delegated to the licensees. This should be much less burdensome than the processing of license applications, deciding the merits of each application and specifying technical conditions which must remain appropriate for the full duration of the license. Many CEPT administrations use registration in the Fixed Service bands for point-to-point links where this approach has proven effective and efficient – indeed almost effortless, now that online registration is replacing the use of paper forms.¹¹ In the UK, the 5.8 GHz, 65 GHz, 70 GHz and 80 GHz bands are available on a self-coordinated “light licensed” basis through link registration.

5 In conclusion

At no point does CEPT conclude that the risk of interference from high duty cycle NRPs into other users of the 870 to 876 MHz and 915 to 921 MHz bands is so great that they should be denied use of these bands. Indeed, the CEPT reports explains clearly how and why NRPs are necessary for the geographic coverage which utilities and M3N need to fulfil the promise of “smart grid” and “smart city” services. So we hope that the results of this consultation will not be to deny authorisation to NRPs.

Such an extreme measure has not been justified either by CEPT or by Ofcom.

¹¹ ECC Report 173: “Fixed Service in Europe – Current use and future trends post 2011” – <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCRep173.PDF>