



Silver Spring Networks (UK) Ltd response to Ofcom's 870/915 UHF spectrum release consultation

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?

Silver Spring Networks (UK) Ltd (SSN) welcomes Ofcom's deliberations in the release of the 870-876/915-921MHz bands, the upper parts (above 872MHz and 917MHz) of which have lain fallow in the UK for a considerable period of time now. SSN has been closely involved with work within ETSI and CEPT and is pleased to help the community to release the spectrum with sensible and useful technical parameters for the benefit of society and the UK economy.

The consultation document provides a comprehensive and balanced narrative on the work that has gone on within CEPT since Ofcom last consulted on these bands. SSN would like to emphasise two further points, however.

A questionnaire on the current use of these bands was issued to all CEPT administrations most of which responded. A report summarising the responses was presented to WGFM at its 74th meeting in Minsk in August 2012. The responses showed that, in half of CEPT countries the bands are completely vacant and in just 11% of countries are the bands completely occupied by military systems (this is not a NATO band). E-GSM-R is planned to be deployed in less than 20% of European countries. Therefore, there is potential for the band to be widely exploited across Europe, particularly for fixed applications (that cannot be 'accidentally' carried into other jurisdictions' territories).

Spill-over of energy from LTE systems likely to be operating in 790-862MHz and from 880-915/925-960MHz is a concern for any systems operating in the band, and so considerable effort is being invested in investigating the likely effects. It is unlikely, therefore, that the spectrum will be attractive for an operator of traditional communications services, but makes the band ideal for licence-exempt applications that are designed for operation in ISM bands.

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.

Smart Energy applications are but one of the sets of applications that could be deployed in the band, and indeed, where suitable spectrum is available, utilities have overwhelmingly chosen sub-GHz wireless mesh for Smart Grid communications over alternative technologies.

Utilities representing over 40 million homes in the US and Australia are now implementing wireless mesh-based communications platforms for Smart Grid, almost all in the 902-928 MHz ISM band. These networks have been expressly designed to meet the Smart Grid communications requirements described above. UK utilities have shown strong interest in having wireless mesh as an option for UK Smart Grid. In countries where licence-exempt spectrum was previously unavailable for the aforementioned applications, regulatory entities have taken steps to allocate sub-GHz spectrum (i.e., Japan, China).

Smart Grid standards have been developed at IEEE, TIA, ETSI and IETF, which will create a worldwide ecosystem, expanding choice and driving down cost. Unlike some technologies proposed for the DECC Smart Metering Implementation Programme, ETSI wireless mesh standards have been earmarked as valid technologies in both EC M/441 Smart Metering and the EC M/490 Smart Grids reference architectures. UK consumers, energy suppliers and distribution network operators would benefit if they had access to this ecosystem.

Current frequency allocations and rules do not permit a practical, cost effective use of ubiquitous wireless mesh as an option for Smart Grid in the UK. The 870-876 MHz and 915-921 MHz frequency bands, at reasonable power levels and duty cycles, are ideally suited for Smart Grid, in terms of range and penetration. The proximity of these bands to the ISM band used in the Americas and Australia offers the potential for the UK to benefit from substantial economies of scale, since it should be possible to use the same radios across all markets.

The European Commission's, Information Society and Media Directorate-General, Electronic Communications Policy, Radio Spectrum Policy (Unit B4) recently published a study¹ 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). The study's was to contribute to a better understanding of the socio-economic value of shared spectrum access, including its impact on competition, innovation and investment.

The report focussed on spectrum for broadband applications, but also noted the scarcity of sub-GHz spectrum for low data applications such as those being considered for this band. The report also highlighted the need to, *'... move radio regulation in a new direction, gradually shifting responsibility for frequency and interference management from administrators to users. The fundamental principle should be that everything is permitted which is not forbidden, rather than the principle which has ruled radio since its inception: that everything is forbidden except what is authorized by the state. If there is to be a transition from one mode of thinking to the other it must be evolutionary. Regulating shared access to spectrum, with progressively less restrictive technical conditions, is the way.'*

Further, *'There is, unfortunately, a conflict of interest between the protection of incumbents and the accommodation of new spectrum users. To resolve this conflict it is not necessary to abandon the existing licensees, to throw open their channels and flood them with noise. What is needed is mutually agreed incremental expansion of allocations, in which interference-free channels are not guaranteed, where users accept responsibility for dealing with interference on their own, and where equipment suppliers have incentives to develop more "polite" protocols and robust equipment.'*

Finally, the EC recently published² a communication highlighting the benefits of shared spectrum and its plans to release more such spectrum over the coming years. The paper highlighted how, *"The trend towards a connected society demonstrates the added value of low spectrum access barriers in licence-exempt shared bands as the breeding ground for wireless innovation that stimulates the development and deployment of more resilient wireless technologies."*

The paper also acknowledges that, *"Research has enabled access to spectrum to be opened up on a shared basis while ensuring that primary services are protected. Cognitive radio technologies are developing today with the support of mandates for harmonised standards and trials in European research projects. More progress can be expected in the area of sensing and use of small cell base stations."*

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?

In the energy sector, alone, availability of this spectrum has the potential to greatly expand the benefits of the UK's Smart Metering Implementation Programme, by allowing use of communications technologies beyond those currently open to the market. Specifically, based upon proven scale deployments of existing technology in the Americas and Australia, and the DECC Smart Metering Impact Assessment; we project an additional **£6.9bn in net benefits** if this sub-GHz spectrum is made available immediately.

Ofcom's own analysis³ underlined that additional harmonised spectrum could be worth up to £4.5 billion **per annum** to the UK, or 0.35% of the country's current GDP.

¹ Perspectives on the value of shared spectrum access: Final Report for the European Commission, Simon Forge, Robert Horvitz and Colin Blackman, February 2012

² 'Promoting the shared use of radio spectrum resources in the internal market', Brussels, 3.9.2012 COM(2012) 478 final

³ The economic value of licence exempt spectrum, Aegis and Ovum, December 2006

DECC's concerns over the availability of a radio solution for Home Area Networking associated with the Smart Metering roll out highlights the lack of suitable licence-exempt spectrum available to industry. The restrictions that European regulators place on transmit power for data modems in the 2.4GHz band and popularity of the 500mW channel in the 868MHz band are testament to demand for higher power licence-exempt sub-GHz spectrum.

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?

The bands 872-876/917-921MHz have lain fallow for too long and are ideal candidates for the applications that are currently under study by the CEPT. By immediately allocating these bands on a licence-exempt basis, Ofcom can enable - in the energy sector alone - the rapid deployment of cost-effective, standards-based communications technology that will place the UK among the worldwide leaders in deployment of Smart Grid, with substantial benefits to UK consumers, the energy sector and the environment. In the longer term, the band will be able to support many new applications, such as Alarms, Home Automation and Automotive.

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 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 2MHz spectrum would be less than ideal, but much of the benefit of the spectrum would still accrue.

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?

The value of the spectrum in these bands is high – whatever the final decision for their use – and it has been unused for almost a decade. This haemorrhaging of value needs to be brought to an end as quickly as possible for the benefit of society and the UK economy. SSN applauds Ofcom's decision to move as quickly as possible, which we believe to be the most effective way of releasing the spectrum whilst minimising the risk to industry, and sees no reason to delay the process.

Furthermore, releasing the spectrum on timescales that are propitious for their use in rolling out DECC's smart metering/Smart Grid network will provide the UK with a technology option that has been overwhelmingly chosen by utilities in other countries where suitable licence-exempt spectrum is available. Early release of the spectrum would also accelerate the development of other licence-exempt applications in the UK, putting the country at the forefront of the roll out of these wider SRD applications.