EPCglobal response to Ofcom consultation Licence-Exemption Framework Review

Monday, 20 August 2007

EPCglobal and its members around the world appreciate the opportunity to comment on the proposed Ofcom approach to the management of spectrum used under licence-exempt conditions. In the following we would like to comment on questions 1, 2, 8, and 10.

Q1: Do you agree that the spectrum commons model should be the preferred approach for licence-exempt use of spectrum, and that application-specific allocations should only be considered where technical constraints or safety issues require this?

As users of RFID technology we are especially interested in the approach, because the deployment of RFID systems depends on the availability of harmonised appropriate radio frequencies under licence-exempt or collective use conditions.

Within the environment of today's global supply chains, harmonisation is necessary to build RFID hardware that is both appropriate and interoperable to ensure that data stored on RFID tags can be read and reread, regardless of the geographical location. This is especially imperative with the cross-border nature of supply and process chains, both within the EU and globally. In addition, harmonisation has the potential to provide a competitive environment, in which devices can become more affordable, thereby providing the potential for RFID readers and tags to become the corner stone of new information infrastructures.

A suitable collective use framework therefore, within which regulatory conditions can be determined is imperative. Such a framework will need to be based on the determined requirements of RFID applications enabling the provision of open supply chain operations via which companies can collaborate to exchange data, mutually benefit from enhanced visibility, and increase the effectiveness within their supply chains, on a global basis.

RFID stands for Radio Frequency Identification. The technology enables data to be transmitted via radio waves, from RFID transponders (tags), to an antenna / antennae,array across an air interface in compliance with a set of locally or globally agreed laws and standards,. Suppliers, manufacturers and retailers, as well as logistics providers equip their operational nodal points for goods moving from one operational zone to another, with antennae controlled by RFID readers. These readers emit radio waves via the antennae

which create a radio field which RFID transponders can use to transmit the data stored on the RFID tag across the air interface. Within the EPCglobal concept, the tag will contain a number code called the Electronic Product Code (EPC). The EPC gives each item or operational entity a unique serialised identity that can be related to operational information held within remote databases. Thus, an EPCglobal enabled supply chain will provide new forms of collaboration between companies and thereby offer numerous positive and / or additional benefits to operational users, (as well as to society in general) by improving the operational efficiency and effectiveness of supply and process chains through greater visibility of operational processes etc (e.g. reducing transport needs, enhancing productivity, increasing security etc.).

Furthermore, with regards to the economic potential of RFID applications, RFID enabled supply chains are only a starting point. Many value-added services or capabilities will potentially be possible if RFID technology were to become more widely adopted. In future operational processes, RFID applications such as “smart shelves” and fast track processing systems could bring multiple benefits to both internal and external stakeholders as track and trace capabilities provide numerous additional benefits in many different formats.

Similar to other innovative wireless technologies such as WIFI, RFID systems have the potential to constitute what can be described as ‘*disseminated network technologies’*. In contrast to mobile phone networks where providers cover large areas through wireless access points and the user’s own client devices (cell phones) use a network service, users in disseminated networks own the access points themselves. Each user essentially becomes his or her own network provider and, directly contributes to the propagation and provision of information on the network as a whole. This is a key difference with important implications for spectrum regulation.

In addition, the radio communication between the reader and tag across the air interface can be defined as part of an information infrastructure whose value for users depends on coverage. Thus, as a disseminated network technology in which users have to invest in their own part of the collaborative network, RFID technology will need to have a logical regulatory approach such as the license-exempt approach outlined in the consultation document.

By definition, it is difficult if not near impossible for individual users of disseminated network technologies to be charged with licensing fees, because it is not obvious who would be the licensee – the hardware provider, the user, the network provider etc., and this technology depends on collective use conditions in order to underpin the value added applications and services that it enables.

The efficient use of radio spectrum allocated under collective use conditions for RFID is therefore in the best interest of users and equipment manufacturers. In the case of RFID

equipment operating in the UHF band, current developments in ETSI show that users of shared bands are capable to develop sharing methodologies and “traffic regulations” (e.g. polite protocols) in order to use the allocated bands effectively.

However, the example of a disseminated network technology like RFID also shows that the diversity of users in a band regulated under a *spectrum commons model* increases the complexity of the necessary deliberations in standardisation bodies, and more importantly, that the unrestricted addition of new users that fulfil the regulator based *politeness rules* jeopardises the service quality of existing users if the standard-based *polite protocols* are not equally binding for a given band.

Hence, although we fully support Ofcom’s initiative to develop an innovative framework for managing spectrum used by licence-exempt devices, we can not agree with the proposed general preference for the spectrum commons model in comparison with applications-specific allocations. As demonstrated above, technologies like RFID depend on the commons model for structural reasons. Those technologies nevertheless need guaranteed level of service in order to deliver the added value. In particular RFID applications in supply chain management also require delay-intolerant real-time communication in order to ensure that data capture in goods handling processes can be guaranteed to be accurate. Accordingly, standards development processes need to take specific requirements into account to develop sharing methodologies that maximise the efficiency of shared spectrum use. But since users engage in multi party deliberation processes to develop suitable operating standards with the aim of dealing with inter-application interference, those standards need to be obligatory for all users of such a common band.

Thus, we propose that OFCOM considers **standard-based allocations** to strike a balance between an open commons model based on *politeness rules* and application-specific allocations. For standard-based allocations, regulator defined *politeness rules* as well as standardisation-based *polite protocols* would both be compulsory. For RFID users, because the technology depends on a commons model for structural reasons, such a pragmatic approach is necessary in order to achieve a sufficient guarantee of service.

Q2: Do you agree with the proposal for multiple classes of spectrum commons?

As explained in our answer to question one, EPCglobal favours a **standard-based allocation** for licence-exempt bands. This approach is similar to the concept classes of spectrum commons as outlined in the consultation document which we regard as promising.

However, EPCglobal would like to stress that the standard development process is an act of self-regulation that increases in complexity as more parties are involved. In addition, a standard is an important anchor of certainty for all stakeholders involved. Thus updating a standard or the authorisation of a new standard in a band in principle jeopardises this certainty. It will therefore be necessary to define *single standard* commons classes for specific bands. Thus in effect, regulators should be capable of allocating commons bands under *politeness rules* to applications that comply with the respective standard, while the development and maintenance of the standard would be the responsibility of standardisation bodies. In addition, it is important to note that a *single standard* does not mean that only one technology can use the bands in question. On the contrary, standards are the means by which sophisticated sharing mechanisms or channel plans can be agreed upon among users with different requirements. The four-channel plan developed for RFIDs and SRDs in the UHF band is a case in point.

Q8: Do you think it could be desirable for transmissions at levels below certain power spectral density limits to be exempt from licensing?

Yes, this approach should also be considered in bands below 1 GHz in order to make under utilized broadcasting spectrum available to new technologies. The maximum power density limits currently envisaged for UHF RFID transmitters are 4 W e.r.p, in a channel width of 400 kHz. In order to enable a efficient reuse of broadcasting spectrum it will be useful to allow users of low power devices in principle to waive their right to receive broadcasts in the their own premises, as long as other recipients of the broadcasts are not affected.

Q10: Do you agree with the harmonisation strategy discussed above in the context of licence-exempt devices?

Yes, especially for RFID applications in the supply chains European and indeed global harmonisation is very important. Two aspects lead to concrete requirements in this matter: the cross-border nature and the importance of low equipment cost.

Because modern supply chains – almost by definition – extend over different borders and connect several regulatory territories, international coordination is of utmost importance to ensure the global interoperability of RFID systems. It is therefore necessary that innovative

approaches to utilise collective use approaches to spectrum management – as laid down in the consultation document – are promoted in Europe. Since the European Commission is already engaged in the topic, EPCglobal would like to point out that licence-exemption as a concept does not exist on the ITU level. As beneficiaries of such an approach, we sense that this fact inhibits the global uptake. We would therefore welcome any activity that raises global awareness for licences-exemption as an innovative and effective approach to spectrum management.

In addition, as building open supply chains requires large numbers of readers, equipment cost play a decisive role in RFID implementation. The disseminated nature of the technology leads to a situation where the infrastructure investment of each RFID user is directly related to the network's capability to include more objects and thus – in accordance with Metcalf's law – create exponential growth. For this reason, RFID tags and readers must be kept as simple and affordable as possible. The best route to achieve this leads through economies of scale which are underpinned by harmonization.

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