Wi-Fi Alliance Response to the Ofcom Licence-Exemption Framework Review

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Responses to specific questions

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?

A1: We do agree that the spectrum commons model should be the preferred approach for licence exempt use of spectrum

The spectrum commons model has drawn fire for the risk of collapse when too many users would try to access the spectrum (Tragedy of the Commons). What has been observed in heavily saturated usage as occurs in urban deployments of 2.4 GHz Wi-Fi systems, voice over Internet Protocol (VoIP) and other service dependant application types may encounter latency issues, but other applications such as security monitoring, dispersed data collection, and even the most common application – email, often continue to operate. To avoid such high latency conditions, a user may decide to shift to a 5GHz spectrum technology or to jump to a 3G or other alternative technology for voice operations when 2.4 GHz can no longer support it.

With regard to application specific allocations, we note that Ofcom should proceed with caution: we believe there is a risk of technical and economic factors invalidating such allocations more rapidly than foreseen - and spectrum lying fallow as a result. More effective ways of tailoring spectrum usage are the class specific commons and light licensing. These two policy means allow spectrum usage to be limited to broad classes of usage, e.g., “rural” wireless infrastructure, RFID, wireless telemetry, etc. Notably, light licensing provides the means for users to coordinate their use of spectrum prior to actual deployment. The choice between these two means should be driven by the risks and consequences of interference caused: more risk requires a more controlled regime.

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

A2: The WFA supports the concept of multiple classes of spectrum commons. Assuming carefully chosen class specifications, the commons classes could be of great benefit in that they help prevent the predicted failure of the spectrum commons model.

Class rules require careful consideration even though they may have to be based on informal notions about the undesirable behaviours of the users of that spectrum class. A simple example is a wireless TV “extender” that continuously transmits at high power. This behaviour conflicts with behaviour based on “listen-before-talk” rules and thus the former is best excluded from a commons class for the latter. This example suggests that commons classes could be separated along lines of inherent incommensurables: e.g., long range/short range, bursty/continuous use, centralized versus distributed control. Although this may be intuitively obvious, actual rulemaking should proceed with great care: mistakes may be difficult to correct.

The Wi-Fi Alliance Spectrum and Regulatory Committee will be pleased to assist Ofcom with detailing this further

Finally, we do not subscribe to the notion that spectrum commons rules will stifle innovation. The fact is that the IEEE 802.11 suite of standards has been very successful in creating a whole new market, and it is still being extended to cover new applications – all the while maintaining backwards compatibility with the original framework of listen-before-talk procedures established in the early 1990’s.

Q3: Do you agree with the distinction made between the licence-exemption and light-licensing regimes?

A3: Assuming light licensing means registration of location and other relevant system data, the answer is yes.

Systems differ in their potential to cause significant interference or to accept interference, and these differences should decide the choice of licensing regime.

Just as the spectrum commons model can be improved by differentiating different classes of device or usage, light-licensing regimes can vary in the means employed to achieve regulatory goals. In some cases, a simple registration scheme – e.g., as established by Ofcom for the 5.8 GHz band - may be considered adequate. In other cases, a beacon based approached – e.g., as formalized in the IEEE802.11y draft standard – may be called for. Cognitive Radio technology will continue to evolve and facilitate new approaches to specific frequency management cases, whether these concern licence exempt or lightly licensed spectrum.

Q4: Do you agree with the view that the licence-exemption and light-licensing regimes will converge in the future?

A4: Given different applications of radio technology and given that different operational requirements will persist, we think it unlikely that this convergence will take place. Presumably, in theory, light licensing could be abolished if all spectrum management policies could be distributed to and embedded in RF devices. This is the long term perspective of Cognitive Radio (CR) technology.

Until such time as CR technology has proven its effectiveness in the many different conditions and situations occurring in the real world, light licensing is a preferable method of organizing the use of spectrum in a generally useful way. As noted above, light licensing can be used in many ways, including letting users coordinate their deployment before installation, to create protection zones around certain objects and to provide for a time limited use of a given piece of spectrum. Given that flexibility, we see light licensing being used for a long time.

Q5: Do you agree with the proposed mixture of licence-exempt and light-licensed use of the 105−275 GHz spectrum? Do you agree with the bands that have been identified for such use?

A5: In general we agree with Ofcom's proposal. Light Licensing can be used to differentiate the parameters for the use of spectrum e.g., allowing high to very how power levels only in a part of the above spectrum range.

Q6: Do you agree with the view that the use of the 275−1000 GHz spectrum should be licence-exempt?

A6: Given the very large range of frequencies concerned, one could argue that there is no need to constrain the use of these frequencies and therefore licence exempt usage is appropriate. However, consideration should be given to the introduction of certain commons classes - for much the same reasons as given above: preventing incompatible systems from interfering with each other.

Q7: Do you agree with the view on the levels of future demand for licence-exempt usage in the 40−105 GHz spectrum? Do you agree that the Group-A bands identified above should be considered for licence-exempt use? Do you agree that licence-exempt and light-licensed use of the Group-C bands identified above should only be considered when there is evidence of demand for such use?

A7: We agree with the proposal to make the group A frequencies available on a license exempt basis. However, we note that in the US, the 70 and 90 GHz bands have been allocated for short range fixed access under a light licensing regime. Technology has been developed that delivers multiple Gbps

throughput combined with good spectrum re-use. We recommend that Ofcom follows the same approach as the FCC so as to create a large market for this technology

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

A8: We agree that this would be desirable, e.g., to reduce the regulatory burden associated with such low power devices. On the other hand, assuming that the intent is to allow unrestricted use of such devices across any frequency band, such a policy may invite misuse that is harder to catch than the misuse of more conventional transmitters which are restricted to a certain frequency range. As with CR technology, both the industry along with the regulatory policies and means have to prove the feasibility of this approach before it is broadly applied.

Q9: Do you agree with the transmission limits proposed in this document?

A9: UWB has become very controversial and so far has seen less use than its proponents have promised. Further regulating this type of technology should wait until greater experience with the practice of ultra-low power devices is gained.

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

A10: We certainly agree with the broad need for harmonisation of spectrum regulations so as to assure a broad market for wireless technology and to facilitate cross border use of wireless equipment. Ofcom has been a leading player in the international spectrum arena and we recommend it continues to play that role.

Q11: Do you agree with the view that no additional regulatory instruments, beyond those available today, are required for the protection of licence-exempt equipment?

A11: Considering the above and assuming the intended instruments include the concept of multiple, class specific spectrum commons, our answer to this question would be affirmative.

The last ten years have seen the emergence of Wi-Fi technology as a major tool for private and public networking. The economic value generated by Wi-Fi related products and services probably compares well with the economic value generated by cellular telephony systems. This fact by itself suggests that protection is desirable against making these systems useless through the emergence of new but spectrally inefficient applications in the same frequency bands. This is happening today in the 2.4GHz ISM band.

CEPT has recognized this and committed efforts to open up the 5GHz band for RLANs under the heading of the “mobile service” at WRC 2003. Here RLAN technology could further develop without threats from “sundry” applications. In effect, this has become an example of a class specific commons. As new wireless applications and technologies are developed, the appropriate regulatory instrument can be selected. Conversely, the creation of a given common class may well create a new technology or application.