Europe

GSMA Europe Response to the RSPG Draft Opinion for Public Consultation on

Spectrum Aspects of the Internet-of-things (IoT) including M2M

9 January 2017

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Register ID Number: 30988577529-37

About the GSMA

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with almost 300 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai, Mobile World Congress Americas and the Mobile 360 Series of conferences.

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Summary

The GSMA agrees that it is vital a clear roadmap is in place regarding spectrum access in Europe. The Internet of Things is a hugely important and rapidly growing market: The connectivity revolution powered by M2M and the emerging Internet of Things is one of the most important trends in modern technology and is set to transform countless industries.

Mobile services play an important role in the wide area IoT market and are rapidly evolving to meet a growing array of different requirements – from smart meters to connected cars. As a result, cellular IoT is becoming increasingly well placed to compete effectively with other IoT solutions thus helping to drive innovation. In this response we further elaborate on the important role that cellular IoT has to play in this area.

In relation to authorisation, we do not disagree with the RSPG's draft opinion, set out at paragraph 5, that *"a complementary mix of general and individual authorisation for spectrum access will be needed to ensure that IoT has access to spectrum. There is no single authorisation framework and no single set of technical conditions for access to spectrum, which would cater for all possible demands*". Ultimately, it is for the market to decide which technologies will best deliver current and future IoT customer requirements. It is vital that regulatory policy does not unduly favour one approach over another.

The GSMA also considers that the RSPG IoT Opinion should:

- highlight that ex-ante regulatory obligations (e.g. consumer protection measures) are no less important where providers are deploying IoT applications in licence-exempt bands;
- apply a technological neutral framework to support IoT;
- place more emphasis on the need for the European Commission and Member States to ensure harmonised availability of 800MHz and 900MHz authorisations for NB-IoT;
- recognise that deployment of SRD or DECT applications in the 1900 – 1920 MHz band would be premature, pending compatibility studies and future clarification of the appropriate licensing regime if licence-exempt use is not appropriate, and
- highlight the important role that regulators have to play in working with the mobile industry to support IoT in 5G spectrum planning.

Comments on Annex

Defining IoT

We agree with the RSPG's draft position that fixing a definition of M2M communications as distinct from IoT only makes a crucial difference if obligations explicitly depend on that distinction.

We would however note that different types of M2M/IoT services will fall under the scope of the ex-ante regulatory framework for electronic communications, irrespective

of the spectrum used to provide the service to the end-user (i.e. whether dedicated or shared). It is important that the regulatory framework does not unduly differentiate between operators based on spectrum use.

Predicted Growth of IoT applications

Cellular M2M connections are expected to grow from 256 million at the end of 2014 to 2.2 billion by 2024[1]. The key cellular IoT markets include utility meters, vending machines, automotive and medical monitoring and alerting. This is in addition to current consumer electronics devices which include e-book readers, GPS navigation aids and digital cameras. The deployment of Narrowband IoT (NB-IoT), a standards-based LPWA technology, will also enable a wide range of new IoT devices and services, which can co-exist with 2G, 3G, and 4G mobile networks. It also benefits from all the security and privacy mobile network features, such as support for user identity confidentiality, entity authentication, confidentiality, data integrity, and mobile equipment identification[2].

Multiple frequency bands, opportunities for both general and individual authorisation models

We note the draft opinion of the RSPG that "*different authorisation models for access to the spectrum aim to meet various use cases and operational requirements*". We would not disagree with this, but would however highlight that it is essential that governments provide a regulatory framework for licensed spectrum that facilitates the development and growth of IoT, and does not impose service or technological restrictions that hold back innovation.

We note that the RSPG's draft opinion, in this section, affirms that '*technologies such as Wi-Fi and Bluetooth may be particularly appropriate for consumer IoT services, such a health, fitness trackers or smart home devices, that do not have very high requirements for low latency communications and operate over a short range*" and that LPWA networks are given as an example category in this respect. The GSMA would highlight that NB-IoT technology, referenced above and as recognised later in the RSPG's draft opinion, is an example of a LPWA network that will also be relevant to consumer IoT services, such as smart home applications which require deep indoor coverage. With this in mind, the GSMA would ask that the word 'particularly' is removed from the statement reference in the paragraph above at page 5 of the Draft Opinion, as it may create a misleading impression that technologies such as Wi-Fi and Bluetooth are more suited to consumer IoT services than NB-IoT networks.

As further context, the latest cellular standard (3GPP Release 13) allows GSM and LTE networks to support LPWA IoT applications in almost all licensed mobile bands. This includes the ability to support personal and IoT connectivity in the same frequency band at the same time[3]. The regulatory environment should be designed to nurture this evolution in the capabilities of mobile networks and allow the market to decide

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[1] https://machinaresearch.com/news/machina-research-expands-the-scope-of-its-iot-forecasts-and-highlights-a-usd4-trillion-revenue-opportunity-in-2025/

[2] For more information on NB-IoT, see http://www.gsma.com/connectedliving/narrow-band-internet-of-things-nb-iot/

[3] IoT and non-IoT services can use different resource blocks within one frequency channel

which solutions thrive. Operators should not be prevented from deploying the latest cellular IoT technologies in their licensed spectrum bands due to technological restrictions and we very much support the RSPG's statement at paragraph 7 that *"frequencies allocated or identified for ECS (mobile networks) may be used for emerging IoT applications and services".*

An expected increase in demand for spectrum in the medium and/or long term

We note that some users, such as utilities and transportation are seeking dedicated spectrum for M2M, particularly when their systems are viewed as part of critical national infrastructure. It is entirely possible technically to support these applications over shared QoS enabled public networks as demonstrated in the recent Ericsson LTE Smart Metering trials[4] and we believe that running such M2M services over shared public networks would be more efficient than using dedicated networks. We would ask that the RSPG Opinion also reflects this activity.

In relation to LPWA, we note that some solutions are proprietary. Some of these are dedicated to integration of (traditional) vertical markets; others are more suited to horizontal markets. This is a sector subject to market and technological disruption and likely to change in the short term.

Spectrum resources under a general authorisation model

Opportunities to open the band 1900-1920 MHz for IoT

We note that the draft Opinion states that there are opportunities to open the band 1900-1920 MHz for IoT and that there is an opportunity to define, in a harmonised approach, technology neutral conditions for the use of the band 1900-1920 MHz that would allow for both DECT and SRD, in the framework of the general authorisation model.

The GSMA notes that the 1900-1920 MHz band is widely licensed for use by public mobile networks in Europe (94 operators in 32 countries according to ECO Report 03). In many cases the licences are tradable and with varying degrees of technology neutrality. Whilst there is currently very limited use of the spectrum amongst these licensees the GSMA is aware of some definite interest to do so if the licences are sufficiently flexible to accommodate latest technologies. The GSMA notes that in this respect, as reported in the minutes of the June 2016 ECC meeting, a licence variation has been requested in the UK.

The GSMA considers it important not to take forward harmonisation measures that could lead to interference between licence-exempt devices and licensed uses of the spectrum. In this regard the compatibility of the currently licensed public mobile network use (or potential use as systems are commonly not yet deployed) with licence-exempt use by DECT or other similar systems has not been demonstrated to be feasible (to our knowledge). We therefore consider it imprudent to promote harmonised introduction of such devices

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[4] For further information see https://www.ericsson.com/news/150809-ericsson-telefonica-and-rwth-demonstrate-lte-optimization-for-smart-meters_244069646_c

The GSMA considers that harmonised definition of new technical conditions for the use of SRD or DECT applications in the 1900 – 1920 MHz band would be premature, pending compatibility studies and future clarification of the appropriate licensing regime if licence-exempt use is not appropriate.

Spectrum resources under an individual authorisation model

Licensed spectrum is uniquely able to provide high quality of service guarantees over wide areas, as operators are not at risk of interference and can control usage levels. As a result licensed cellular IoT may be the only choice for services which require concrete assurance levels such as for security and medical applications amongst others. Licensed spectrum also encourages sustainable, long-term investment in networks as access and quality levels are assured.

Contrastingly, licence-exempt spectrum is intrinsically less suited to wide-area IoT applications, especially those requiring higher quality of service levels. This is due to the fact that permitted power levels are generally low and interference risks over long distances are high - especially as the number of service providers and usage levels scale up. As a result regulators should ensure the IoT market can be allowed to benefit from the unique benefits licensed spectrum brings, which will be relevant to the individual authorisation model.

Licensed spectrum also has the capacity and coverage capabilities to support rapid IoT growth. There is a good, and growing, amount of licensed mobile coverage (i.e. sub-1 GHz) and capacity (i.e. above 1GHz) spectrum to support the rapid growth of IoT if regulators support service and technology neutrality. In practice, most of the bands that will be used for cellular IoT will be sub 3 GHz or more likely sub 1-GHz. Mobile services in these bands are well established worldwide in mature networks and can be employed to support IoT as well as personal mobile services relatively easily. Crucially, the IoT technologies in the latest mobile standard, Release 13, significantly build on the coverage capabilities of existing spectrum. For example, initial trials have demonstrated that 2G networks require only a software upgrade to enable a seven-fold improvement in the range of low-rate IoT applications and extended device battery life (up to 10 years).

It is also vital that spectrum usage is harmonised. We note the RSPG's draft Opinion that "*It appears there are no regulatory barriers to deploying NB-IoT in the 800MHz band (as long as the technical conditions are met)*" and also that "*The current regulatory framework does not allow deployment of NB-IoT in the 900MHz band*" (given the 900MHz authorizations require compliance with specific ETSI harmonised standards, which do not currently cover NB-IoT). We very much agree with the RSPG's draft opinion that Member States should ensure harmonised use in these bands - in fact we believe that the emphasis on this point should be stronger than in the current draft opinion.

We are surprised to see that the band 2570 – 2620 MHz is suggested for consideration as a PMR band even though it is licensed to mobile network operators in many European countries. This band should continue to be considered as a band for public

mobile networks, whilst recognising that those licence holders could choose (if desired) to operate IoT within the band.

5G spectrum planning

Finally, it is important that the European Commission (in consultation with the RSPG as appropriate) takes any necessary action to implement a technology neutral approach, as envisaged by its recent C-ITS Masterplan which highlights that the Commission will consider, where appropriate, making use of its mandate under the ITS Directive to adopt delegated act(s) by 2018… on ensuring a forward looking hybrid communication approach. CEPT ECC Decision (08)01 should also be updated as required.