GSMA response to Ofcom consultation on WRC-19

The GSMA welcomes the opportunity to respond to Ofcom's consultation on UK preparations for WRC-19. Our response focuses in particular on Agenda Item 1.13, a successful outcome from which will be vital for the success of 5G. We also provide responses/comments on some other WRC-19 agenda items that are of potential relevance for the mobile industry.

Question 2 - Agenda Item 1.13 - IMT in bands above 24 GHz

The GSMA agrees with Ofcom's support for the following three bands/frequency ranges to be prioritised from within those being considered under Agenda Item 1.13, and believes that these should be identified for IMT on a global basis in the Radio Regulations at WRC-19:

- 24.25-27.5 GHz ('26 GHz band')
- 37-43.5 GHz (as global tuning range within which different countries/regions can select which portions to use in their parts of the world)
- 66-71 GHz

The following paragraphs consider each of these in more detail.

26 GHz band

We welcome CEPT's decision to support 24.25-27.5 GHz as a 'pioneer band' for 5G. In addition to Europe/CEPT, the 26 GHz band is also gaining increasing support in other parts of the world, including Africa, the Middle East, and parts of Asia and the Americas. The 26 GHz band is adjacent to the '28 GHz band' (27.5-29.5 GHz) which will be the first millimetre-wave 5G band in the US, South Korea, Japan and Canada, and the first for which equipment will be available. Initial equipment for the 28 GHz band will cover the frequency range 26.5-29.5 GHz, and this will help enable wide harmonisation, low handset complexity, economies of scale and early equipment availability for the top part of the 26 GHz band in Europe.

However, some of the technical conditions that have been proposed/adopted for the 26 GHz band will severely constrain use of the band for 5G. In particular, the unwanted emissions limit for IMT base stations that has been adopted in the ECC Decision for the 26 GHz band will make the lower part of the band unusable for outdoor 5G networks, and have significant negative impact on performance of 5G systems in other parts of the band. This will make it very difficult for Europe to compete globally with other countries that are giving themselves the conditions and flexibility needed to make their industries leaders in 5G, such as Korea and the US. Other countries that are supporting the 26 GHz band, including in Africa and the Middle East (as well as China and other countries outside Region 1) are also favouring less restrictive conditions than those that are being adopted for Europe. It is important that technical conditions for the 26 GHz band (and other 5G band) are not over-restrictive and do not stifle the development and implementation of 5G networks and services, and are aligned with other parts of the world to enable Europe to benefit from global economies of scale.

37-43.5 GHz

The GSMA also supports the identification of 37-43.5 GHz for IMT on a global basis. This would provide a globally harmonised frequency range for 5G, within which different countries/regions can select different portions to be used in their parts of the world. Identifying the whole of this band for IMT at

WRC-19 will allow flexibility for different countries/regions to choose which parts to implement, whilst providing for harmonisation of equipment to drive economies of scale and lower equipment costs.

We therefore support the position being promoted by Ofcom for 40.5-43.5 GHz to be identified for IMT on a global basis and used for 5G in Europe, as part of a wider global tuning range 37-43.5 GHz to be identified for IMT for use in different countries/regions as appropriate for them. This will enable Europe to use 40.5-43.5 GHz for 5G, and at the same time facilitate usage of other portions of 37-43.5 GHz in other countries/regions, both below 40.5 GHz (e.g. as in the case of the US) and in frequency ranges that extend both above and below 40.5 GHz (e.g. as being proposed in some countries in APAC). We believe this can create a mutually advantageous 'win-win' situation at WRC-19, providing flexibility for different countries/regions to achieve their required objectives whilst enabling harmonisation and economies of scale, as opposed to a situation where countries block each other as has sometimes happened at previous WRCs.

66-71 GHz, and other bands above 45 GHz

The 66-71 GHz band also holds strong interest for the mobile community. The FCC decision to use this band for 5G adds momentum to the existing support for this band in Europe, Africa and RCC. The GSMA supports the identification of 66-71 GHz for IMT, and that it should be available for use by 5G systems with flexibility to allow different licensing regimes, enabling both IMT and non-IMT technologies. The nature of 5G usage and licensing in this band is expected to be different than in other bands, and it represents a complement rather than a substitute for spectrum in the 26 GHz and 40 GHz bands.

We also believe that other bands above 45 GHz should also continue to be considered for possible IMT identification, in particular bands around 45/50 GHz, due to the large amounts of spectrum that will be needed for 5G services in the future. Studies should continue to investigate the feasibility of being able to use these bands for IMT.

Question 3 - Agenda Item 1.14 - HAPS (High Altitude Platforms)

Some of the frequency bands that are being considered for HAPS under Agenda Item 1.14 are also being considered under Agenda Item 1.13 as potential bands for IMT, in particular 24.25-27.5 GHz (in Region 2) and 38-39.5 GHz (globally). Any consideration of these overlapping frequency bands under Agenda Item 1.14 should not limit the possibility to identify these bands for IMT on a global basis under Agenda item 1.13, and should not lead to restrictions on possible usage of IMT in these bands. We therefore share Ofcom's view that the focus for the 26 GHz band should be as a globally harmonised band for 5G, and believe that a similar principle should also apply for 38-39.5 GHz (as part of a global 37-43.5 GHz tuning range).

Any use of HAPS, if identified in bands being considered for IMT under Agenda Item 1.13, or other bands used by mobile networks, should not impact IMT identification or in any way limit the potential of mobile 5G networks. There must not be any constraints on IMT in the Radio Regulations related to sharing with HAPS, and HAPS should not cause interference to or claim protection from IMT. It is thus necessary to establish technical and regulatory provisions for HAPS to be able to avoid interference to IMT and other applications in the mobile service.

In addition to future use for mobile/5G, many of the fixed service bands being considered for HAPS under Agenda Item 1.14 are also used by mobile operators for fixed links/services. These include the bands 24.25-26.5 GHz and 38-39.5 GHz mentioned above, and also the bands 6440-6520 MHz, 6560-6640 MHz and 27.9-28.2 GHz where there are already some provisions for HAPS usage but the extent and scope of such usage is being considered to be expanded. Any such measures to expand possible

HAPS usage in these bands should ensure protection of and not restrict usage of these bands by mobile operators under the fixed service.

Question 4 - Agenda Item 1.16 - RLANs in 5 GHz bands

The GSMA generally supports the usage of RLANs/WiFi in the bands between 5150 and 5925 MHz that are being considered under Agenda Item 1.16. Regarding some of the particular bands within this range that are being considered on a band-by-band basis, we support the following:

- 5150-5250 MHz: RLAN operation is currently restricted to indoor use only. We support removal of the indoor only restriction in order to permit outdoor use.
- 5725-5850 MHz: There is already fairly widespread use of this band by RLANs/WiFi in many countries, without any DFS, indoor or low power restrictions. We support that there should be no new restrictions on RLAN operation in this band in countries where such operation is already permitted.
- 5850-5925 MHz: We support no change to the Radio Regulations in this band, where there is already a primary mobile allocation.

Question 5 - Issue 9.1.5 - ITU-R Recs referred to for 5 GHz bands

Further to our response regarding Agenda Item 1.16 above, we believe that any updating of versions of relevant ITU-R Recommendations referenced in the Radio Regulations must not introduce retrospective limitations on existing RLAN devices.

Question 6 - Issue 9.1.8 - Machine-type communications

We agree with UK's support for 'No Change' to the Radio Regulations for this agenda item, and believe that development of an ITU-R Report or ITU-R Recommendation would be sufficient (to be developed by the responsible ITU-R Study Group outside the WRC process).

Mobile networks / IMT technologies should be able to provide MTC (machine-type communications) / IoT services within any mobile/IMT band. MTC/IoT services are a major focus for the mobile industry, and it is vital that there is a supportive regulatory environment that enables the use of mobile/IMT bands for such services, without unnecessary constraints.

Agenda items such as 1.11, 1.12 and Issue 9.1.8 risk setting a precedent for additional requests for dedicated spectrum for specific applications, which is something we believe would be undesirable, and would lead to inefficient use of spectrum / lack of flexibility.

Question 8 - Agenda Item 1.5 - ESIM (Earth stations in motion)

The GSMA believes that careful consideration is needed for all aspects of this agenda item, given the importance of the spectrum bands under consideration to the mobile industry for existing allocations to both fixed and mobile services in different parts of the world. ESIM must be designed and operated so as to be able to accept the interference caused by terrestrial services and not cause unacceptable interference to terrestrial services operating in accordance with the Radio Regulations. Any regulatory

provisions that are adopted under this agenda item must ensure that ESIM do not cause interference to or claim protection from terrestrial services.

It is necessary to break down the different types of ESIM in order to do this. Maritime and Aeronautical ESIM may be able to share with FS/MS under appropriate technical and operational conditions, such as limiting maritime operations to certain distances from the coast and aeronautical operations to a pfd limit. Land-based ESIM, however, present a more complex sharing scenario, given their ability to be present at any geographical location within the FS/MS network, which means that site/geographical coordination would not be possible. Given the likelihood of harmful interference in cases of operation in close proximity to terrestrial stations, land-based ESIM should only be considered on a non-interfering basis.

Unlike 19.7-20.2 GHz and 29.5-30.0 GHz, the bands being studied under Agenda Item 1.5 (i.e. 17.7-19.7 GHz and 27.5-29.5 GHz) are allocated to fixed and mobile services and their protection needs to be guaranteed. Within Europe, the use of ESIM within the frequency bands 17.3-20.2 GHz and 27.5-30.0 GHz is harmonised according to ECC Decision (13)01. Under this ECC Decision, in conjunction with ECC Decision (05)01, the 27.5-29.5 GHz band is effectively segmented into portions that can be used for FS and those that can be used for uncoordinated FSS earth stations (including ESOMPs), as follows:

- 27.8285-28.4445 and 28.9485-29.4525 GHz are designated for the use of FS systems;
- 27.5-27.8285, 28.4445-28.9485 and 29.4525-29.5 GHz are designated for the use of uncoordinated FSS earth stations.

The above FS bands are heavily used by operators for fixed services, and this usage needs to be protected.

It should also be recognised and due account taken of the fact that, unlike other FSS earth stations, ESIM terminals are not 'fixed' but 'in motion', and may move across international borders.

Question 9 - Agenda Item 1.6 - Non-GSO FSS in 40/50 GHz bands

The GSMA does not have strong views on the establishment of regulatory provisions for non-GSO FSS systems per se. However the bands being considered under Agenda Item 1.6, namely 37.5-39.5 GHz, 39.5-42.5 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz, are also being considered under Agenda Item 1.13 as potential bands for IMT. This could potentially lead to additional complexity for Agenda Item 1.13 when considering these overlapping frequency bands, and it is important that this does not cause additional complication and confusion. Furthermore, there is extensive existing usage of some of these bands for fixed links, and this usage needs to be protected. Any actions that may be taken under Agenda Item 1.6 in relation to the possible operation of NGSO FSS systems in these frequency bands should not lead to additional constraints on terrestrial usage of these bands, and should not restrict the possible use of IMT in these bands. Existing use of these bands by terrestrial services should not be impacted, and existing regulatory provisions for such use should remain unchanged.

Question 11 - Issue 9.1.1 - Coexistence between IMT and MSS in S-band

We do not believe this Issue is one that CEPT should be getting involved in, since it does not affect CEPT countries. The MSS uplink band (1980-2010 MHz) will not be used for transmissions from IMT base stations in Europe, and hence Scenario A1, which concerns interference from terrestrial IMT stations into satellites, will not occur with IMT base stations in practice. We do not believe that CEPT should use political capital by engaging in this Issue, which is controversial for some countries outside Region 1 but should not be of concern to CEPT.

Notwithstanding the above, the GSMA supports 'No Change' to current regulatory conditions in the Radio Regulations in relation to this Issue.

Question 12 - Issue 9.1.2 - Coexistence between IMT and BSS in 1452-1492 MHz

The GSMA supports the specification of a pfd limit for BSS (sound) in the frequency band 1452-1492 MHz in accordance with the results of sharing and compatibility studies to protect IMT stations, and supports no change to the Radio Regulations with respect to protection of BSS (sound) receivers. This applies for Regions 1 and 3 (Region 2 is out of scope of the agenda item and no change should be made to the regulatory conditions currently in force for Region 2).

Question 20 - Agenda Item 1.11 - Railway track-to-train communications

The GSMA agrees with the view that there should be 'No Change' to the Radio Regulations for this agenda item. We do not believe that specific identification in the Radio Regulations for such applications of the Mobile service is necessary or desirable. Development of an ITU-R Report or ITU-R Recommendation would be sufficient (to be developed by the responsible ITU-R Study Group outside the WRC process).

Agenda items such as this risk setting a precedent for additional requests for dedicated spectrum for specific applications, which is something we believe would be undesirable, and would lead to inefficient use of spectrum and lack of flexibility.

Question 21 - Agenda Item 1.12 - ITS (Intelligent Transport Systems)

The GSMA agrees with the view that there should be 'No Change' to the Radio Regulations for this agenda item, since development of an ITU-R Report or ITU-R Recommendation would suffice.

Mobile networks / IMT technologies should be able to provide commercial ITS services within mobile/IMT bands, as well as safety-related ITS applications in spectrum that has been set-aside for ITS (e.g. 5850-5925 MHz in many countries). Intelligent Transport Systems are a major focus for the mobile industry, and it is essential that there is a supportive regulatory environment that enables the use of mobile/IMT bands for commercial ITS services, and the use of the 5.9 GHz band for non-commercial, safety-related ITS applications (which has been set-aside for this purpose in many markets).

Question 32 - Agenda Item 10 - Agenda items for WRC-23

The GSMA supports the Agenda Item 2.5 that is already included in the preliminary agenda for WRC-23 that was agreed at WRC-15 "to review the spectrum use and spectrum needs of existing services in the frequency band 470-960 MHz in Region 1 and consider possible regulatory actions in the frequency band 470-694 MHz in Region 1 on the basis of the review in accordance with Resolution 235". This agenda item was part of a delicate compromise and agreement that was made at WRC-15 between different parts of Region 1, and this agreement should be respected.

Furthermore, we believe that also other bands should be considered under WRC-19 Agenda Item 10 as the identification process is complex and time-consuming. The GSMA is reviewing the bands below 24 GHz globally to be proposed for consideration under this Agenda Item, taking into account different situations in the various regions. In particular, special attention in Europe should be given to the 3.8-4.2 GHz band due to the proximity to the 3.4-3.8 GHz priority 5G band.