Joint response by GSMA, ETNO, Small Cell Forum, DIGITALEUROPE and GSA

Key comments to the EC proposal of Implementing Regulation for SAWAPs

1 April 2020

Our organizations welcome the European Commission proposal to give effect to the SAWAP provisions of the EECC to allow harmonized light deployment regimes leveraging simple criteria such as volume, emission power and compliance of SAWAP installation with the applicable European Standards (EN50401 and EN62232). We welcome Recital 16 that allows Member States to adopt less restrictive approaches, noting that many Member States already permit larger volumes or higher powers than those defined in the proposed SAWAP regulation or provide for no restrictions at all indoor as opposed to the proposed SAWAP regulation.

Our objective is that the criteria defined in this Implementing Regulation (IR) support the fast deployment of SAWAPs to meet the criteria of broadband objectives of the European Commission. Therefore, we propose changes to strengthen the effectiveness of the proposed measures.

1. The current SAWAPs deployed outdoor or indoor in larger areas such as museums, stadiums, convention centres, airports, metro-transport stations, railway stations, or shopping centres, have an emission power of 10 W or more as defined in 3GPP specifications and as such belong to classes E100 or sometimes E+. Therefore, the criteria for applicability of the IR should be 10 W emission power so that it applies to a wide range of installations.
2. Installation classes E10 and below are generally dedicated to indoor applications and deployed very close to where people work and live. Therefore, limiting the applicability of the draft IR to class E10, corresponding to emission power 0.5 W, which is similar to a mobile phone, means that it will have very limited potential benefit for stakeholders in real world deployments.
3. The proposed volume of 20 litres applies to limited functionality SAWAP that can serve a single mobile radio access technology in a single sector, potentially across multiple bands, excluding the auxiliary equipment (for example, the power supply) that is not part of the 20 litres.
4. A minimum volume of 50 litres is required to support multi-technology or multi-operator SAWAP. Unless this is permitted, we will see a negative business impact on small cells deployment (and future synergetic usage of co-located technologies like cellular vehicle-to-everything) and an overall risk of Europe falling behind other regions.
5. The proposed IR will have to be updated shortly after the update of EN62232 in order to incorporate the simple deployment criteria for active antenna systems (AAS) for example those using millimetre waves. We recommend to review the provisions of the IR six months after publication of the updated EN62232.

The attached document sets out the proposed amendments.

A. Proposed amendments

Text additions or changes are marked in bold and underline. Deletions are marked with strikethrough.

Proposed Changes	Rationale
Recital (6) … Deletion ~~**The study for the Commission "Light Deployment Regime for Small-Area Wireless Access Points (SAWAPs)[3]" demonstrates that a volume limit of 20 litres should be sufficient to contain the main elements of a small-area wireless access point, while ensuring its unobtrusive character. This maximum volume should apply to any deployment of a small-area wireless access point serving one or more spectrum users, as well as of multiple small-area wireless access points sharing an infrastructure site of small surface, such as a light pole, a traffic light, a billboard or a bus stop, which due to its physical dimensions and/or dense replication in a given area is likely to generate visual clutter.**~~	As evidenced in our contributions to the SAWAP consultation in 2019 a volume of 20 to 30 litres (as mentioned in the study for the Commission) per SAWAP is not sufficient; in line with our proposals for Annex A.1 and A.2.
Recital (7) Small-area wireless access points, should comply with the European harmonised standard **EN 50401 and its related basic standard** EN 62232:2017 "Determination of RF field strength, power density and specific absorption rate (SAR) in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure", which provides (…).	The harmonised standard is EN 50401, which refers to assessment methods specified in EN 62232:2017.

Proposed Changes	Rationale
Recital (8) This standard applies to all type of base stations **~~divided into~~ including** five installation classes corresponding to different limits of their equivalent isotropical radiated power (EIRP) of a few milliwatt (Class E0), 2 Watt (Class E2), 10 Watt (Class E10), 100 Watt (Class E100) and above 100 Watt (Class E+) respectively. Out of these classes, considering the installation safety distances to be respected under this standard and since Directive (EU) 2018/1972 provides that small-area wireless access points should be low power equipment, this Regulation should only apply **to small area wireless access points having an emission power less than or equal to 10 Watt**. **~~the installation classes E0, E2 and E10. Table 2 of clause 6.2.4 of EN 62232:2017 requires that the lowest radiating part of the antenna of a Class E10 has a height of at least 2.2 meters above the general public walkway to ensure a distance of at least 20 cm between the main antenna lobe and the human body of a 2 m tall person5~~**.	Regarding the proposed power limits, we strongly believe that a maximum EIRP of 10W (associated with class E10) is too restrictive and would exclude the majority of outdoor small cells and medium coverage indoor small cells in larger areas such as museums, stadiums, convention centres, airports, metro-transport stations, railway stations, or shopping centres from the scope of this new regulation, which would make the benefit of the permit-free regime very limited. Hence, we propose a maximum emission power of 10W for SAWAP, instead of the 10W EIRP (corresponding to 2 x 0.5 W emission power, comparable to mobile phones) that E10 class would allow.

Proposed Changes	Rationale
Recital (9): Deletion. ~~**For aesthetic reasons, the indoor installation of small-area wireless access points of Class E10, which are likely to utilise the maximum volume limit of 20 litres, should be limited to large indoor places with a ceiling height of at least 4 metres, such as museums, stadiums, convention centres, airports, metro transport stations, railway stations, or shopping centres**~~	Given the importance of effective in-building coverage we are of the view that the provisions dealing with visual impact in this regulation should not apply to indoor installations, where design matters it should be the responsibility of the building owner. This view also seems to apply in the Commissions own report where the consultants do not recommend a volume limit for indoor installations (Table 6.1 of the report referenced at footnote 3 in the draft Regulation). The 4 m height is not justified and would prevent the deployment of small cell and distributed antennas systems within standard offices and many other public and private buildings (i.e. train stations, see as an instance the COMMISSION DECISION of 21 December 2007 concerning the technical specification of interoperability relating to 'persons with reduced mobility' in the trans-European conventional and high-speed rail system providing for 2.30 m as minimum headroom). The inclusion of indoor installations might be a trigger for national modifications of this Commission Implementing Regulation. ~~I~~n addition, the assumption that class E10 indoor installations require a large volume is not supported by data. There are superior indoor coverage products with a small volume and EMF compliance distance of less than 2 cm, thus the reference to aesthetic reasons for this recital is not valid
~~**Recital (10) The weight of a small-area wireless access point and its shape should not impose structural reinforcement of the support structure used.**~~	Structural integrity should be responsibility of the infrastructure owner not of this regulation and there already exists national regulations to cover this point. In addition, the EECC allows for member states to ask for a permit for public safety reasons.

Proposed Changes	Rationale
Recital (11) As further development of the relevant standards is foreseen, if they are to cover small-area wireless access points employing active antenna systems, such access points should not fall in the scope of the permit-exempt deployment regime at this stage. **The present Regulation to be updated in order to incorporate small-area wireless access points employing active antennas in accordance with Article 3a.**	Recital (11) and (14): We note that IEC62232:2017 is currently under review with the aim to complete the update in 2020 and have it published in 2021. In order to ensure that updates are rapidly included in an updated SAWAP regulation we propose the amendment.
Recital (12) In order to allow supervision and monitoring by the competent authorities, in particular in cases of multiple co-located antenna systems, any operator which has deployed **outdoor E2 or above** small-area wireless access points in compliance with the characteristics laid down in this Regulation, should submit in due time a notification to the competent authority concerning the installation and location of those access points. **The notification should be standardised at the national level, be brief and submitted via a single information point and focus on a statement of compliance of the installation with the provisions of this Regulation.**	In our consultation response we proposed for transparency reasons to have a simplified notification requirement **for E2** and above for outdoor installations. The draft text provides for notification for all SAWAPS. Whilst we understand the objective, in our view E0 installations should be exempt given the low visual impact and the low EMF emission level (they are touch-compliant). Most importantly, the notification should be standardised at the national level, be brief and submitted via a single information point and focus on a statement of compliance of the installation with the provisions of the light deployment regime. The building owner should be responsible for indoor installations.
Recital (14) The implementation of this Regulation should be regularly monitored in order to facilitate its **review within 6 months after the publication of the updated EN62232 and as necessary thereafter**, taking into account national practice and developments in standardisation, in particular with regard to the inclusion of active antenna systems.	See our comment to Recital 11.
Recital (16): This Regulation is without prejudice to the application of **any** less restrictive regimes at national level for the deployment of small-area wireless access points, in order to facilitate commensurate density and low visual impact of small-area wireless access deployment.	In order to ensure that the present Regulation does not repeal the national regulations providing for less restrictive regimes for the deployment of small-area wireless access point.
Article 1: **This Regulation is without prejudice to the application of less restrictive regimes at national level for small-area wireless access deployment.**	In order to provide legal certainty, we propose to reflect the content of Recital (16) as a new third paragraph in Article 1. See our comments to Recital (16).

Proposed Changes	Rationale
Article 2(3) 'active antenna system (AAS)' means an antenna system of a small-area wireless access point, where the amplitude and/or phase between **more than two co-polar** elements with **overlapping radiation patterns** is continually adjusted resulting in an antenna pattern that varies in response to short term changes in the **user distribution and the** radio environment. This excludes long-term beam shaping such as fixed electrical down tilt. In a small-area wireless access point equipped with an AAS, the latter is integrated as part of the small-area wireless access point.	Article 2(3): We propose amendments to the definition of Active Antenna Systems (AAS) as the current definition would encompass the vast majority of existing 3G and 4G small cells which use closed loop MIMO. The basis of which is to adjust phase and/or amplitude in response to changing channel conditions. We understand the intention is to exclude array type antenna systems with potentially high beamforming gains which are the subject of ongoing study. We propose the additional text to distinguish between basic MIMO which exploits orthogonal polarisations to increase spectral efficiency, and massive MIMO which can form beams across multiple co-polar elements.
Article 3(3) Operators which have deployed **outdoor E2 and above** small-area wireless access points, which comply with the characteristics laid down in paragraph 1, shall notify the competent authorities about the installation and location of those access point**s. The notification should be standardised at the national level, be brief and submitted via a single information point and focus on a statement of compliance of the installation with the provisions of this Regulation.**	See our comments to Recital (12).
Article 3a Review Clause **Annex B and the related recitals shall be reviewed within 6 months of publication of the updated EN 62232:2017, and as necessary thereafter, to account for developments on standardised small cell deployment rules compliant with EMF thresholds recommended by ICNIRP.** **Annex A and the related recitals shall be reviewed at least 4 years after the coming into force of the Regulation, and as necessary thereafter, with a view to adapting visual impact and volume requirements to the evolution of small cell technologies.**	See our comments to Recitals (11) and (14). We propose a new Article 3a to ensure that the regulation is updated consistent with developments in technology and standards.

Proposed Changes	Rationale
Annex A.1: The total volume of the visible part of a small-area wireless access point serving one ~~**or more spectrum users for a given**~~ **mobile radio access technology** shall not exceed 20 litres.	Consistency with deletion of Recital 6. A 20 litre volume would support a limited functionality SAWAP that can serve a single mobile radio access technology in a single sector, potentially across multiple bands, excluding the auxiliary equipment, for example, the power supply, is not part of the 20 litres.

Proposed Changes	Rationale
Annex A.2: The total volume of the visible parts of multiple separate small-area wireless access points sharing the same infrastructure site of small surface, such as a light pole, a traffic light, a billboard or a bus stop, shall not exceed ~~20~~ **50** litres. **This 50 litre volume shall also apply for multi-technology and multi-operator small-area wireless access points.**	As evidenced in our contributions to the SAWAP consultation in 2019, we are concerned that the 20 litre volume limit is too small and as illustrated below, may limit the potential positive impact in the diffusion of 5G services by a timely small cell deployment. In particular, we are advised that a limit of 20 litres for multiple SAWAPs will not allow an additional technology or most cases of multi-operator small cells even if the auxiliary equipment is non-visible. We already have experience of blending the small cell equipment into the surroundings, and recognise that the aesthetics are an important element of small cell deployment. Nevertheless, a minimum visible volume is required to achieve a proper balance between deployment costs and visual impact. A limit of 20 L visible volume will in our view imply that, given the technology currently available, only a few high-cost alternatives will benefit from the light regime. One of them would be nearly full integration of the small cell in the supporting infrastructure, something only achievable in practice by the manager of the supporting infrastructure at a high incremental cost, possibly requiring a re-design of supporting infrastructures such as lamp posts or bus stops that would slow down the diffusion of 5G services and interfere with the compliance with the coverage obligations contained in the rights to use frequencies and would increase the total development costs. The other one would be a scenario of single operator/single technology deployment, which in our view would be extremely inefficient and require a disproportionately high number of small cells to achieve the required overall capacity. Unless the volume limit is 50 L for multiple separate small-area wireless access points sharing the same infrastructure site and for multi-technology and multi-operator sites, we see a risk of Europe falling behind, as MNOs face higher costs and fewer alternatives to host small cells than other regions, and only a small set of players are eventually able to benefit from the light regime.

Proposed Changes	Rationale
Annex A.3: In the cases where the antenna system and other elements, such as a radiofrequency unit, a digital processor, a storage unit, a cooling system, power supply, cabling connections, backhaul elements or elements for earthing and fixation, of the small-area wireless access point are separately installed, any portion thereof in excess of ~~**20 litres**~~ **the volumes specified in point 1 and point 2 above** shall be made invisible.	Consistency with Annex A.1 and A.2.
Annex A.5: Deletion	Structural integrity should be responsibility of the infrastructure owner not of this regulation and there already exists national regulations to cover this point. In addition, the EECC allows for member states to ask for a permit for public safety reasons.
Annex B.1: **Small area wireless access points shall have an emission power of less than or equal to 10 Watt and deployment** shall be in accordance with the installation classes E0, E2, ~~and~~ E10, **E100 and E+** of Table 2 of clause 6.2.4 of the European standard EN 62232:2017 "Determination of RF field strength, power density and specific absorption rate (SAR) in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure".	Consistency with Recital 8.
Annex B.2: Deletion.	Consistency with Recital 9 deletion.
Annex B.3: In the case of multiple co-located antenna systems (or portions thereof) of one or more small-area wireless access points, the criteria for the EIRP contained in the reference in point 1 shall apply to the sum of EIRP of all ~~**co-located**~~ antenna systems (or portions thereof) **co-located and transmitting in the same direction**.	EIRP does not add, for example, when antennas are transmitting in opposite directions. For more details refer to EN62232:2017.

B. Supporting Information

Estimates of the volume requirements of a small cell in 2019 based on current technology:

Estimated volumes (2019, based on current technologies)	Single SAWAP	Tri-sector SAWAP
Radio Unit (not including the Base Band Module, which is assumed to be placed in a different centralized location)	10 L	3x10 L
Antenna	3-5 L	10-15 L
Transmission/backhaul (wireless)	0,4/4-5 L	0,4/4-5 L
Power supply (auxiliary)	18 L	18 L

- One radio unit is needed per technology (i.e. two technologies require two radio units) and it may support multiple bands
- One antenna is needed per each technology
- Only one power unit per small cell is required
- Operators sharing a site can use the same power unit, but in general require separate radio units, antennas and transmission.

Based on the specifications above, we can conclude that:

- Assuming everything is visible, one operator with multiple technology would already go beyond 20 L.
- Even assuming power can be made “non-visible”, with a limit of 20 L it would not be possible to add an additional technology.
- The volume requirements grow substantially if there are two or more operators or enhanced services like C-V2X sharing the site. Sharing, even between only two operators, would in practice not be possible unless all the components of the small cell are “invisible”

Greater equipment volumes allow sites to yield more benefit by supporting more technologies and functionalities like backhaul by way of a smaller number of small cells in the same area. Larger volumes are also required for features such as MIMO, which increase data rates for users. SAWAP sites are costly to own, and therefore it is important to maximise the benefits achievable. Multiple types of wireless equipment may be deployed, supporting multiple technologies, using different frequency bands (licensed and unlicensed spectrum), for multiple operators and for wireless backhaul. The volume limits should allow for infrastructure competition, and at the same time facilitate voluntary sharing, while minimising the visibility of small cells.





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