

## D8.1 - CURRENT STATE OF REGULATIONS AND FUTURE PROSPECTS



### VIRTUALLY INVISIBLE SMALL-CELLS FOR 5G DENSIFICATION

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#### SUMMARY (EN):

This deliverable collects and reviews national and international regulation of particular importance for INVISIBLE 5G project. Particular attention is given to the regulation related to the Light Deployment Regime for Small-Area Wireless Access Points (SAWAPs). The vision for future evolution is also addressed in this document.

This deliverable verifies M8.1 – “Analysis of current regulations and future prospects”.

#### SUMÁRIO (PT):

Este entregável coleciona e revê a regulamentação nacional e internacional de particular importância para o projeto INVISIBLE 5G. É dada especial atenção à regulamentação relativa ao “*Light Deployment Regime for Small-Area Wireless Access Points (SAWAPs)*”. A visão para a evolução futura também é abordada neste documento.

Este entregável verifica M8.1 – “Analysis of current regulations and future prospects”.



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## 1. Scope

The scope of this Deliverable is to collect and review national and international regulation of particular importance for INVISIBLE 5G project. As already defined in the Technical Annex (TA) the development of our 5G small-cell base station should follow the recommendations of the Light Deployment Regime for Small-Area Wireless Access Points (SAWAPs) regulation and pre-seeded by the European Electronic Communications Code (EECC), which are being analysed herein. Finally, the consortium's vision for future evolution and prospects is also presented in this document.

This deliverable verifies M8.1 – “Analysis of current regulations and future prospects”.

## 2. Current Regulation

### 2.1. The EECC

The **European Electronic Communications Code (EECC)** is an EU Directive<sup>1</sup> that consolidates, updates and replaces the four Directives that made up the EU **regulatory framework for electronic communications, including the telecommunications sector**. It is designed to promote the investment in new high-capacity networks such as fibre and 5G networks.

The aim of the EECC is to drive investment in new high-capacity networks (principally the fifth generation of mobile telecommunications, or 5G, and new fibre networks) and create a ‘level playing field’ between telecommunications companies and over-the-top providers (OTTs)<sup>2</sup>.

**The EECC entered into force on 20 December 2018 and EU Member States have until 21 December 2020 to transpose it into national law<sup>3</sup>.**

According to the *Autoridade Nacional de Comunicações (ANACOM)*, the Portuguese spectrum regulator entity, the draft project for the transposition of the European Electronic Communications Code was sent to the Government and to Parliament by July 2020<sup>4</sup>.

In particular, **Article 57 of the EECC asks the European Commission**, by means of implementing acts, **to specify the physical and technical characteristics**, such as the maximum size, weight and, where appropriate, **emission power of SAWAPs**, and operates to prevent “competent authorities” (which would include, for example, local authorities) from making the deployment of small area wireless access points subject to any individual permits. Moreover, Member States must ensure that local and national authorities offer access to operators to street furniture (like lampposts and street signs) for the installation of wireless access points on fair, reasonable and non-discriminatory terms, with a single point of contact. These measures are designed to make it

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<sup>1</sup>European Electronic Communications Code (EECC): <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L1972&from=EN>

<sup>2</sup>Website: <https://www.accesspartnership.com/introducing-the-new-european-electronic-communications-code-eecc/>

<sup>3</sup>OFCOM public statement: [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0020/209504/eecc-statement-dec-20.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0020/209504/eecc-statement-dec-20.pdf)

<sup>4</sup>ANACOM press release: <https://www.anacom.pt/render.jsp?contentId=1557849>

significantly cheaper, and easier, to install the infrastructure needed to build and improve networks, especially the forthcoming 5G networks<sup>5</sup>.

## 2.2. The SAWAP

Dated 3rd December 2019, the European Commission released the results of a study<sup>6</sup> with the objective of assisting the Commission in implementing the requirements of Article 57 of the European Electronic Communications Code, to facilitate 5G deployment.

The study<sup>6</sup> carried out an analysis of existing and planned definitions of small cells with focus on their physical and technical characteristics (size, weight, installation height, visual characteristics, etc.). The current regulatory requirements for small cells deployment in each Member State, the criteria for granting relevant permits (including aesthetics and power limits), and the possibilities and conditions for exemptions have been explored. The study dealt with the relevant emission power limits and the way they are addressed in relevant existing standards (e.g. EN 50400, EN 50401, IEC/EN 62232) in compliance with the Radio Equipment Directive (RED). It also investigated relevant situations in countries outside the EU, as well as international initiatives regarding the adoption of generic criteria for the exemption of small cells from approval processes. The findings of the Study have contributed to the specification of adequate physical and technical characteristics of SAWAPs, to be taken into account in the planned Commission implementing regulation and to the assessment of the impact of such a measure. The study also provides analysis of the procedures for the deployment of SAWAPs and identifies additional possible criteria to be used in order to determine the EU light deployment regime. Furthermore, the recommendations on future actions such as addressing public concerns about the visual appearance (i.e. aesthetics) of SAWAPs deployment and a notification mechanism of installed SAWAPs to assist evaluating the exposure of the general public to electromagnetic fields, can be used as a basis for further legal or concerted steps to stimulate small cells deployment.

Recently in July 2020, the European Union released a working document<sup>7</sup> on a light deployment regime for small-area wireless access points, accompanying the COMMISSION IMPLEMENTING REGULATION specifying the characteristics of small-area wireless access points pursuant to Article 57 paragraph 2 of Directive (EU) 2018/1972 of the European Parliament and the Council of 11 December 2018 establishing the European Electronic Communications Code.

Finally, on June 30<sup>th</sup> 2020, the European Commission has implemented the regulation (EU) 2020/911<sup>8</sup>, specifying the characteristics of small-area wireless access points pursuant to Article 57(2) of Directive (EU) 2018/1972 of the European Parliament and the Council establishing the European Electronic Communications Code.

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<sup>5</sup>Website:<https://www.technologysleage.com/2018/12/the-new-european-electronic-communications-code-updated/>

<sup>6</sup>Final report prepared of the European Commission on light deployment regime for SAWAP:<https://op.europa.eu/en/publication-detail/-/publication/463e2d3d-1d8f-11ea-95ab-01aa75ed71a1/language-en>

<sup>7</sup>EU working document on light deployment regime for SAWAP: <https://edz.bib.uni-mannheim.de/edz/pdf/swd/2020/swd-2020-0139-en.pdf>

<sup>8</sup>Regulation (EU) 2020/911 of 30 June 2020:[https://www.wb6cif.eu/wp-content/uploads/2020/07/CELEX\\_32020R0911\\_EN\\_TXT.pdf](https://www.wb6cif.eu/wp-content/uploads/2020/07/CELEX_32020R0911_EN_TXT.pdf)

### 2.3. Major aspects of Regulation (EU) 2020/911

Due to the importance to the INVISIBLE 5G project, the consortium highlights the major aspects extracted from the Regulation (EU) 2020/911 of 30 June 2020<sup>8</sup>:

(...)

- In order to ensure public acceptance and sustainable deployment, **small-area wireless access points** subject to the second subparagraph of Article 57(1) of Directive (EU) 2018/1972 **should have minimal visual impact**. To achieve this, **they should be either invisible or mounted in a visually non-obtrusive way onto their supporting structure**. Their operation should also ensure a high level of protection of public health, as laid down in Council Recommendation 1999/519/EC (2) on the limitation of exposure of the general public to electromagnetic fields (EMF).

(...)

- **The physical and technical characteristics of small-area wireless access points** subject to the second subparagraph of Article 57(1) of Directive (EU) 2018/1972 **should therefore be defined in terms of maximum volume, restrictions on weight and maximum emission power for user connectivity**. The choice of maximum volume to delimit the visual impact of a small-area wireless access point should allow design flexibility and adaptability to the physical and technical characteristics of the supporting structure.
- **The study for the Commission ‘Light Deployment Regime for Small-Area Wireless Access Points (SAWAPs)’ 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.
- **Small-area wireless access points, should comply with the European harmonised 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 a methodology for the installation of base stations taking into account their emission power for the purpose of evaluating human exposure to the electromagnetic fields (‘EMF’), in compliance with the limits set in Recommendation 1999/519/EC.
- This standard applies to all type of base stations divided into five installation classes corresponding to different limits of their equivalent isotropic 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 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 metres 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 person.

- 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.

(...)

Which regulates:

- From Article 1:
    - o This Regulation lays down the physical and technical characteristics of small-area wireless access points referred to in the second subparagraph of Article 57(1) of Directive (EU) 2018/1972.
    - o This Regulation (EU2020/911 of 30 June 2020) **shall not apply to small-area wireless access points with an active antenna system (AAS).**
  - From Article 2: For the purposes of this Regulation, the following definitions shall apply:
    - o ‘equivalent isotropic radiated power (EIRP)’ means the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna;
    - o ‘antenna system’ means a hardware part of a small-area wireless access point that radiates radio frequency energy for the purpose of providing wireless connectivity to end users;
    - o ‘**active antenna system (AAS)**’ means an antenna system of a small-area wireless access point, where the amplitude and/or phase between antenna elements is continually adjusted resulting in an antenna pattern that varies in response to short term changes in 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;
- (...)
- From Article 3:
    - o Small-area wireless access points referred to in the second subparagraph of **Article 57(1) of Directive (EU) 2018/1972** shall be fully and safely integrated in their supporting structure and therefore invisible to the general public, **or meet the conditions set out in point A of the Annex to this Regulation, and shall comply**

**with the requirements of the European standard laid down in point B of the Annex to this Regulation.**

- Paragraph 1 is without prejudice to powers of the Member States to determine the aggregate levels of EMF resulting from the colocation or the aggregation in a local area of small-area wireless access points and to ensure compliance with applicable aggregate EMF exposure limits in accordance with Union law by means other than individual permits.
  - (...)
- From ANNEX Point A:
1. **The total volume of the visible part of a small-area wireless access point serving one or more spectrum users shall not exceed 20 litres.**
  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 litres.
  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 shall be made invisible.**
  4. The small-area wireless access point shall **comply with visual characteristics which ensure visual consistency** with the supporting structure and have a proportionate size relative to the overall size of the supporting structure, **coherent shape, neutral colours and concealed cables**, and shall not, together with other small-area wireless access points that are already installed in adjacent sites, create aggregate visual clutter.
  5. The weight of a small-area wireless access point and its shape shall not impose a structural reinforcement of the supporting structure.
- From ANNEX Point B:
1. **Deployment shall be in accordance with the installation classes E0, E2 and E10 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'.**
  2. **A small-area wireless access point of the installation class E10 shall be only deployed outdoors or in indoor spaces with a ceiling height of at least 4 m.**
  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).**

### 3. Future Prospects

In regard to future prospects, the consortium will keep track to the most recent updates in term of international regulation yield by the European Commission in particular on Light Deployment Regime for Small-Area Wireless Access Points, but also to national regulation that may be released by the national authority for the telecommunications - ANACOM.

### 4. Conclusions

This deliverable collects and reviews national and international regulation of particular importance for INVISIBLE 5G project. Particular attention is given to the regulation related to the Light Deployment Regime for Small-Area Wireless Access Points (SAWAPs) the pre-seeded European Electronic Communications Code (EECC) The vision of the consortium for future prospects is also addressed in this document.

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