Implementing Act – 5G Light Deployment Regime and EMF Matters

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- **5G will transform our economy and society**. It will make new services possible in healthcare, energy, transport or education.
- **5G (and future 6G) networks will use much smaller antennas** compared to current systems. At the same time, the new antennas will achieve much better coverage and higher connection speeds. They will also be less visible and produce less electromagnetic emissions. In fact, they could be compared to WiFi installations.
- Reflecting this, and to accelerate the roll-out of this important new technology in the EU, **bureaucratic procedures should be simple**, while ensuring that authorities keep oversight. For this reason, the Commission will adopt by June an **implementing regulation** in accordance with new EU telecom rules (European Electronic Communications Code[1]).
- To this end, the Commission draft Implementing Regulation defines the constraints on a **small set of physical and technical characteristics of small-area wireless access points being volume, weight, visual impact and emission power**. These characteristics are selected to create a significant scale of small-area wireless access points equipment in the single market, and to generate wide public acceptance and trust in its deployment, by ensuring the aesthetical visual impact and high levels of public health protection against electromagnetic fields (in line with Council Recommendation 1999/519/EC).
- The draft act **is not introducing new EU limits for the exposure to electromagnetic fields (EMF)** nor it changes the power of national authorities to set generally applicable visual or environmental limits or electromagnetic fields limits applicable to small or larger cells (in accordance with the Code). It also leaves intact the power of competent authorities to enforce those rules. Furthermore, installations will have to adhere to applicable national or regional regulations.

[1] https://ec.europa.eu/digital-single-market/en/news/european-electronic-communications-code-updating-eu-telecom-rules

- The **Council Recommendation 1999/519/EC**[2] sets out strict limits for exposure of the public to electromagnetic fields in line with the 1998 International Commission on Non-Ionising Radiation Protection (ICNIRP)[3] guidelines. This means: EU exposure limits for the general public are always at least **50 times lower than what international scientific evidence suggests as having any effect on health**. The above limits are not binding for the EU Member States. However, the European Electronic Communications Code refers to them and calls on Member States to ensure consistent application.
- An example for the Commission's precautionary approach is that the proposed implementing regulation **does not address small cells with active antenna system** because there is not yet such a standard ensuring compliance with exposure limits for protecting human health (as set out in the Council Recommendation 1999/519/EC).
- ICNIRP released new Guidelines[4] in March 2020. After 20 years and based on a vast review of the scientific knowledge and public consultation, **the new ICNIRP guidelines confirm the appropriateness of existing limits** for the exposure to electromagnetic fields with slight adaptations to the measurement methods and to protection limits in relation to higher 5G frequencies.
- The European Commission is now looking carefully into ICNIRP's findings, and will re-examine the situation in relation to the 1999 Council

[2] OJ L 199 of 30.7.1999, p.59:
(https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999H0519&from=EN)

[3] ICNIRP is an independent non profit scientific organisation based in Germany founded in 1992 by the International Radiation Protection Association (IRPA), specialising in non-ionizing radiation protection. The group is recognised and supported by the World Health Organisation (WHO). As presented by ICNIRP, ICNIRP's resources consist in subsidies from national and international public institutions such as the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU), the European Union Programme for Employment and Social Innovation ("EaSI") 2014-2020 and IRPA, in support received to organize meetings or workshops from national ministries or radiation protection agencies, and in private donations from private individuals or from businesses not related in any way to the field of non-ionizing radiations, which are listed in the ICNIRP donors' report. ICNIRP insists that it is free of vested interests as its members cannot be employed by industry, must comply with the ICNIRP's policy of independence and must publicly declare their personal interests. ICNIRP's annual financial report is published online. https://www.icnirp.org/en/about-icnirp/funding-governance/index.html

The Commission is not aware of any conflicts of interests of members of international bodies such as ICNIRP or the members of SCENIHR. This was confirmed by the Ombudsman responding to a specific complaint regarding SCENIHR in case 208/2015/PD. https://www.ombudsman.europa.eu/en/cases/decision.faces/en/78175/html.bookmark

[4] https://www.icnirp.org/cms/upload/publications/ICNIRPrfgdl2020.pdf

Recommendation based on a **review by its relevant scientific committees** (Scientific Committee on Health, Environmental and Emerging Risks - SCHEER)[5] - or the Scientific Advice Mechanism - SAM[6]).

- Exposure to EMF at the limits currently recommended at international and EU level has been classified by the WHO International Agency for Research on Cancer (IARC)[7], in a 2011 report, as "possibly carcinogenic". To put this in perspective, it places such exposure in the **same 'possibly carcinogenic' category as pickled vegetables, and considers it less risky than eating red meat, night shift work or drinking hot coffee** which are considered by the IARC as being "probably carcinogenic", which is a higher category of risk. The report also distinguishes between different sources of EMF exposure, pointing out, for example, that typical environmental exposures to the brain from mobile-phone base stations on rooftops and from television and radio stations are several orders of magnitude lower than those from [2G] GSM handsets.

[5] SCHEER is the successor of the Scientific Committee on Emerging and Newly identified Health Risks (SCENIHR) - https://ec.europa.eu/health/scientific_committees/scheer_en. The above scientific body is appointed and renewed as appropriate following an open and objective selection process.

[6] https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/scientific-support-eu-policies/group-chief-scientific-advisors_en

[7] http://publications.iarc.fr/126

Background

The draft Implementing Regulation on Small cells:

- Small-area wireless access points are important for a successful development of 5G networks. Article 57 of the European Electronic Communications Code tasks the 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 small-area wireless access points (small cells), that will be exempted from any individual town planning permit or other prior individual permits, except for environmental or historical reasons or public safety. The Commission must deliver this by June 2020.
- In the light of this, the Commission launched a public consultation on small-area wireless access points (or small cells that are used in a form of a network device), which was closed on 10 April 2019. The synopsis report of the results of the open public consultation will be published in due course. A summary of the results has already been published.
- The Draft Implementing Regulation on Small Cells was published on 27 February on the 'Better Regulation Portal', in the context of 'Have your say', which means that another four-week public consultation is currently taking place.
- For the preparation of the relevant Implementing Regulation, the Commission has taken into account the outcome of the 2019 public consultation, the recommendations of a related Commission study on a "light deployment regime for small-area wireless access points", as well as the results of the stakeholder workshop in November 2018.
- Based on the outcome of the Commission's study, the public consultation as well as various contributions from Member States and industry, the proposed regulatory approach to an EU light deployment regime for small-area wireless access points puts a focus on the issues of visual appearance (i.e. aesthetics) and public health protection (i.e. output power) of small-area wireless access points deployment. These are important for wide public acceptance of the measure.
- These characteristics match the definition of small-area wireless access points, which refers to low power equipment and low visual impact antennae, as well as ensuring compliance with exposure to electromagnetic fields exposure limits pursuant to the Council Recommendation 1999/519/EC for reasons of public health protection. As small-area wireless access points are expected to be deployed in big numbers, these two aspects are crucial for building public trust and acceptance of small-area wireless access points deployment.
- To this end, the Commission draft Implementing Regulation defines the constraints on a small set of physical and technical characteristics of small-area wireless access points being volume, weight, visual impact and emission power. These characteristics are selected to create a significant scale of small-area wireless access points equipment in the single market, and to generate wide public acceptance and trust in its deployment, by ensuring the aesthetical visual impact and high levels of public health protection against electromagnetic fields (in line with Council Recommendation 1999/519/EC). In this context, the implementing regulation is not about setting new limits because we already have the strictest limits via the above Council Recommendation.

New beamforming antennas technology in 5G networks and any health effects this new technology may have

- The new 2020 ICNIRP guidelines encompass 5G developments such as operations in very high (milimeter-wave) frequencies and new systems such as active antenna ones with pulsed (very short time exposure) and beamforming (concentrated energy) emissions.
- To cater for these technological developments, the ICNIRP 2020 updated guidelines extend the current whole-body specific absorption rate (SAR) limits for the public for frequency bands up to 300 GHz and include a new approach to exposure measurement in frequency bands above 6 GHz.
- 5G active antenna systems will improve end-user experience, capacity and coverage, and keep exposure of the general public to cumulative exposure to electromagnetic fields well below the new ICNIRP limits. In line with the Radio Equipment Directive 2014/53/EU, any new radio equipment shall have to be constructed in such a way as to ensure the protection of public health and safety, as reflected in the harmonised standards adopted in line with this Directive[8], developed pursuant to the permanent standardisation mandate from the Commission to European Telecommunications Standards Institute (ETSI)[9].
- Concerning the Commission Implementing Regulation on small-cells, it should be noted that as long as the applicable standards do not cover small-area wireless access points with active antenna systems, such small-area wireless access points will not be covered by the EU-light deployment regime for the purpose of ensuring transparent and adequate protection of public health.

Further background information regarding potential effects of 5G on health:

- With 5G the general trend is to lower-power cells. There is the potential for lower exposure in areas served by these smaller cells. One example are indoor cells: if most users are connected to low-power antennas that are indoors, antennas outside the buildings need to use less power as they do not need to penetrate the buildings.
- Overall, a recent Commission study[10] showed that combined with 4G, only a modest cumulative increase of the overall exposure can be expected in urban areas where 5G is deployed and where 4G antennas are still used. In the future, 4G with larger cells will be used less in the 5G areas and hence these areas will be exposed to less power coming from the larger cells and smart phones. As an example[11], first relevant

[8] As set out in the Communication "Harmonised standards: enhancing transparency and legal certainty for a fully functioning Single Market" adopted on 22 November 20181 2, the Commission has been entrusted with the responsibility for assessing the European harmonised standards and ensuring their compatibility with the requirements of the corresponding Union harmonisation legislation. This process ends with the publication of the references of the harmonised standards in the Official Journal of the European Union.

[9] See mandate to ETSI : file:///C:/Users/lippepa/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/m305en.pdf
Confirmed by :file:///C:/Users/lippepa/AppData/Local/Packages/Microsoft.MicrosoftEdge_8wekyb3d8bbwe/TempState/Downloads/M536EN.pdf
file://net1.cec.eu.int/HOMES/014/lippepa/My%20Documents/standardisation/OJ%202014%20confirmation%20of%20mandates%20to%20ETSI.pdf

[10] SMART 2017/0015 "Study on using millimetre wave bands for the deployment of the 5G ecosystem in the Union"

[11] Ofcom has carried out the first UK safety tests of 5G base stations, finding that radiation levels are at "tiny fractions" of safe limits, the BBC reported. Whilst the rollout of 5G has sparked fears that the technology could be dangerous to humans, Ofcom found no identifiable risks in its tests, with the highest result they found for 5G at 0.039% of the recommended exposure limit. The tests covered 16 locations in 10 cities across the UK where 5G-enabled base stations had been set up.

measurements in the UK on the cumulative EMF effect (involving mm-waves but also frequencies below 6 GHz) indicate radiation levels much lower than the existing safety limits in line with the 1999 Council Recommendation.

- Additionally, the number of sources as such does not determine the electromagnetic fields exposure at a given location. Most 5G networks are expected to use smaller cells than previous generations with lower electromagnetic fields exposure levels. This is confirmed by experience. The introduction of 3G and 4G has not increased exposure from environmental fields and this result has been published also in peer-reviewed journals. In particular, the introduction of 3G has lowered exposure of mobile phone users for calls, compared to 2G.
- EU regulation aims to ensure consistency and predictability throughout the Union regarding the way the use of radio spectrum is authorised in protecting public health against harmful electromagnetic fields (0 Hz- 300 GHz), having particular regard to the precautionary approach taken in Council Recommendation No 1999/519/EC.
- The Commission agrees that there is a need for constant updates of scientific knowledge, which must also be taken into account in the development of the 5G technology. Such knowledge will contribute to the aim of balancing exposure of the general public to EMF with benefits brought by 5G (including eHealth) to the quality of life.
- In the context of 5G, the Commission is engaged in discussion with the Member States in the Communications Committee (COCOM) to establish an overview of national approaches for the protection against non-ionizing radiation which include calculation methods and measurement tools, information for the General Public/Awareness campaigns (in cooperation with various authorities: health, environmental, ICTs, local city councils), and general cost/benefit analysis for different EMF limits (national/local). In the same context, it is worth noting that the forthcoming European Electronic Communications Code (EECC) in article 45 calls for consistency and predictability throughout the Union regarding the way the use of radio spectrum is authorised in protecting public health on the basis of Council Recommendation 1999/519/EC and ensuring more consistent deployment conditions for 5G across the Union.
- Further information on the health effects of exposure to electromagnetic fields, can be found in the following factsheet:
  https://ec.europa.eu/health/scientific_committees/docs/citizens_emf_en.pdf
  More details on exposure limits can be found here:
  https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999H0519&from=EN

Concerning potential non-thermal (e.g. general health, biological, cancer) effects on human health from exposure to 5G EMF

- Current scientific knowledge (as notably reported publicly by the WHO[12] and considered by ICNIRP in the process of updating their guidelines) does not show a

https://www.ofcom.org.uk/spectrum/information/mobile-operational-enquiries/mobile-base-station-audits/2020?utm_medium=email&utm_campaign=Ofcom%20publishes%20latest%20spectrum%20measurement%20results&utm_content=Ofcom%20publishes%20latest%20spectrum%20measurement%20results+CID_376f7d6ac510c926db5681373dfa3a9c&utm_source=updates&utm_term=latest%20results%20from%20our%20spectrum%20measurement%20programme

[12] https://www.who.int/peh-emf/about/WhatisEMF/en/index1.html

causal link between non-thermal effects on human health and exposure to electromagnetic waves, in general, while research continues in some areas.

- On general health effects, the WHO reports that some members of the public have attributed a diffuse collection of symptoms (headaches, anxiety, suicide and depression, nausea, fatigue and loss of libido) to low levels of exposure to electromagnetic fields at home. To date, scientific evidence does not support a link between these symptoms and exposure to electromagnetic fields. The French Agence nationale de securité sanitaire (ANSES – national agency for health protection) has assessed over several years general health effects (such as headaches, sleep and attention disorders) and exposure to the EMF. Its most recent study from 2018, based on the work of 40 experts mobilised over a period of four years, concluded that such pain and suffering indeed "require and justify appropriate management by health and social actors" but at the same time found no causal link between health and exposure to EMF.
- In the area of biological effects and medical applications of non-ionizing radiation approximately 25,000 articles have been published over the past 30 years. Scientific knowledge in this area is now more extensive than for most chemicals. Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low-level electromagnetic fields.
- In the area of cancer, exposure to EMF at the limits currently recommended at international and EU level has been classified by the WHO International Agency for Research on Cancer (IARC) at the third level in a scale of five levels of risk as "possibly carcinogenic". It puts such exposure in the same 'possibly carcinogenic' category as pickled vegetables, and considers it less risky than eating red meat, night shift work or drinking hot coffee, which are assessed as "probably carcinogenic". The WHO further notes that despite many studies, the evidence for any effect remains highly controversial. However, it is clear that if electromagnetic fields do have an effect on cancer, then any increase in risk would be extremely small. The results to date contain many inconsistencies, but no large increases in risk have been found for any cancer in children or adults. Again, it must be stressed that the overall exposure for current cellular technologies as well as 5G will be far below recommended limits.
- Regarding any link between the deployment of 5G and the spread of the Coronovirus an announcement on 08 April 2020, among others, by the WHO[13] made clear that no such link exists.

[13] https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters