Safety of 5G Mobile Networks

5G is the next generation of mobile technology that will transform the role of mobile connectivity in society, enabling changes in the way we live and do business. The radio signals used for 5G are similar to those used by current technologies and are covered by the same international safety guidelines that protect all members of the public and the environment.

5G is an evolutionary mobile technology that supports many new capabilities

5G is the next generation of mobile technology. It is designed to support new applications through Gigabit data rates, low latency and high reliability. It will also provide efficient support for large numbers of connections, enabling the Internet of Things (IoT). 5G will deliver smarter and more convenient living and working. Initial 5G networks launched in 2018 and 5G connections will grow to around 15% of global connections by 2025.

5G is covered by existing international safety guidelines

The radio signals used by mobile technologies have been extensively studied for decades. This scientific evidence is the basis for the international safety guidelines for radio signals.[1] These guidelines include all the frequencies under consideration for 5G.

The consistent conclusion of public health agencies and expert groups is that compliance with the international guidelines is protective for all persons (including children) against all established health risks.

Public health agencies confirm no health risks expected from 5G

Australia:
'Although the 5G mobile phone network is new, limits set in safety standards, our understanding of the evidence of health effects and the need for more research have not changed.' (ARPANSA, 2019)

Europe Union:
'The strict and safe exposure limits for electromagnetic fields recommended at EU level apply for all frequency bands currently envisaged for 5G.' (European Commission, 2017).

Norway:
'Measurements show that the total exposure from mobile and radio transmitters that we are exposed to today is weak and is far below the limits for what is harmful to health. We have no reason to believe that the introduction of 5G will change this.' (DSA, 2019)

Many initial 5G deployments will be at frequencies similar to 3G/4G mobile networks and Wi-Fi. This also means that many existing antennas sites can be reused for 5G.

To achieve higher capacity 5G can also use higher frequencies that are used today by the mobile and satellite industries for other purposes. These frequencies are known as millimetre-waves (mmW or mmWaves) and they are covered by the safety guidelines.

The same limit values that protect people also protect the environment. The responsible German government agency[2] says that there is no scientifically reliable evidence of a risk to animals and plants exposed to radio signals at levels below limits in the international guidelines.

1. World Health Organization: https://www.who.int/peh-emf/standards/en/
2. Bundesamt für Strahlenschutz

(Continued on reverse)

Radio signals will remain well below the safety guidelines

Based on experience with 3G and 4G networks and the results from 5G trials the overall levels in the community will remain well below the international safety guidelines. International standards exist for the compliance assessment of 5G network antennas and devices. These standards include new approaches for smart antennas and the use of new frequency ranges.

SMART ANTENNA TECHNOLOGIES PROVIDE COVERAGE WHERE IT IS NEEDED

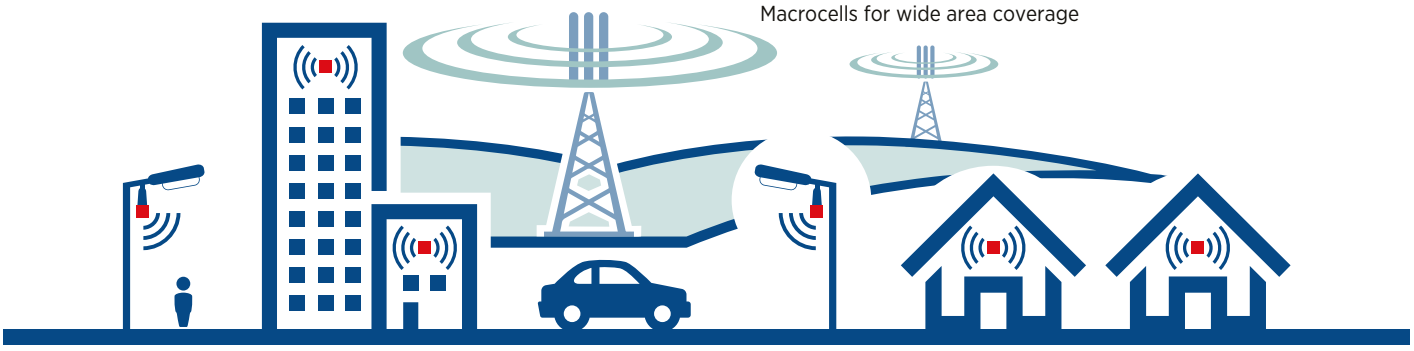
Conventional antenna

Smart antenna

5G networks can use smart antenna technologies (such as multiple input multiple output – MIMO) that deliver radio signals where they are needed. Conventional antennas provide coverage similar to how a floodlight illuminates a wide area. The new antennas are like a flashlight providing coverage where it is needed and reducing unwanted signals. Smart antennas increase capacity and improve efficiency.

Small cells are used by current mobile networks to provide localised coverage or capacity and their use will expand with 5G. They may be mounted on street lights or inside buildings, where over 80% of mobile usage occurs in developed markets. Measurements on 4G small cells by the French spectrum agency found that levels in nearby areas remained well below the international safety guidelines.[3]

REPRESENTATION OF A 4G/5G MOBILE NETWORK



In-building and street small cells

Home small cells

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3. Rapport technique sur les déploiements pilotes de petites antennes en France pour favoriser l'accès au très haut débit mobile. L'Agence nationale des fréquences (ANFR). December 2018.