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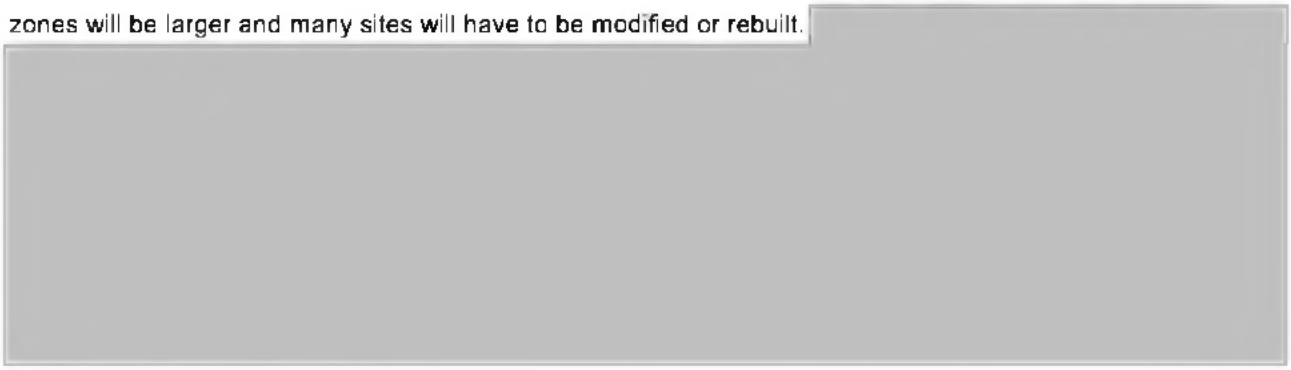
Meeting Huawei 04/07/2019

The meeting was organised to discuss new 5G products (MIMO, beamforming systems), features developments, antennas, inputs to the standards, including the new calculation formulas and the ways to validate them in field.
The main points of the presentation provided are as follows:

Mobile traffic is growing and there is no sign that this trend may stop any time soon. It is expected that mobile traffic will increase significantly. Therefore, if we do not introduce 5G, deployment will be more costly as more macro cells will be needed to have this capacity demand addressed. Also, in terms of energy consumption, a 5G site will consume the same as a 4G site but will provide 10 times more capacity (Energy Efficiency). This means that the 5G consumption/bit is an order of magnitude lower than 4G. It is anticipated that power consumption at 5G will be 1/10 of 4G per bit.
The active antennas have a series of advantages compared to the passive (legacy) ones (Spectrum Efficiency):

- there is a reduction of power/user since the user is individually beamed only when their handset is active,
- there is less interference between users are there are 'separate' beams,
- the antenna beam can be shaped to exclude more sensitive locations such as schools or hospitals (dynamic narrow beams)
- the uplink traffic can allow prediction of downlink requirements (this is more easily done with TDD used for 5G)

Small cells 'detract' power from macro cells so that the total power remains the same and is 'divided' between the small cells.
5G antennas have a better gain than 4G ones, typically 24 dBi versus 17-18 dBi. This means that the EIRP (which is the antenna input power*gain) will be higher. If we consider this higher peak, then the exclusion zones will be larger and many sites will have to be modified or rebuilt.



Solutions to the worst case are:

1) Reduce output power but this of course entails a lack of capacity. This could be done in early deployment

2) Monitor EIRP levels in each direction to ensure it is always 6 dB lower than average. This feature should be available in 2020.
The current ICNIRP limits (from 1998) are based on an average of 6 mins. A revision is expected in the fall of 2019 and it is expected that the average exposure will be increased in 30 minutes. There are different approaches in Member States as to how to get from the ICNIRP human exposure limits to the power limits for

equipment.

With regard to the EMF measurements, Huawei stressed that 3GPP has not yet produced a standard In this context, Huawei encouraged the Commission to work for the adoption of common methods of calculation and measurement of EMF exposure in order to achieve consistency across the EU.

The standard IEC 62232:2017 ("Determination of RF field strength ("Determination of RF field strength, power density and SAR in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure") covers also active antennae systems . In addition, it is expected that Technical Report 62669 (IEC TR62669) will be incorporated into IEC 62232:2017 standard by 2020.

Finally, with regard to the cumulative EMF exposure due to the combination of 5G with existing networks, such as 4G, a modest cumulative increase in the overall EMF exposure by 10% is expected, but is still far below the ICNIRP limits. However, Huawei highlighted that this increase is small compared to the new 5G services and their benefits.