

ELECTROMAGNETIC FIELDS AND 5G ROLL-OUT

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WIRELESS TECHNOLOGY IS OMNIPRESENT AND EXPANDS EXPONENTIALLY

FUTURE 5G NETWORKS WILL DRAMATICALLY EXPAND PENETRATION OF WIRELESS DEVICES AND ENFORCE HIGH INFRASTRUCTURE DENSITY.

ANTICIPATED IMPACTS OF 5G IMPLEMENTATION:

- reduced End-to-End latency
- 10 times to 100 times higher number of connected devices
- 1000 times higher mobile data volume per geographical area.

Currently, inter-operator interconnect points are relatively sparse. In order to support a 5G service with 1 millisecond delay by achieving interconnection at every base station, there will have to happen a major change impacting the topological structure of the core network.

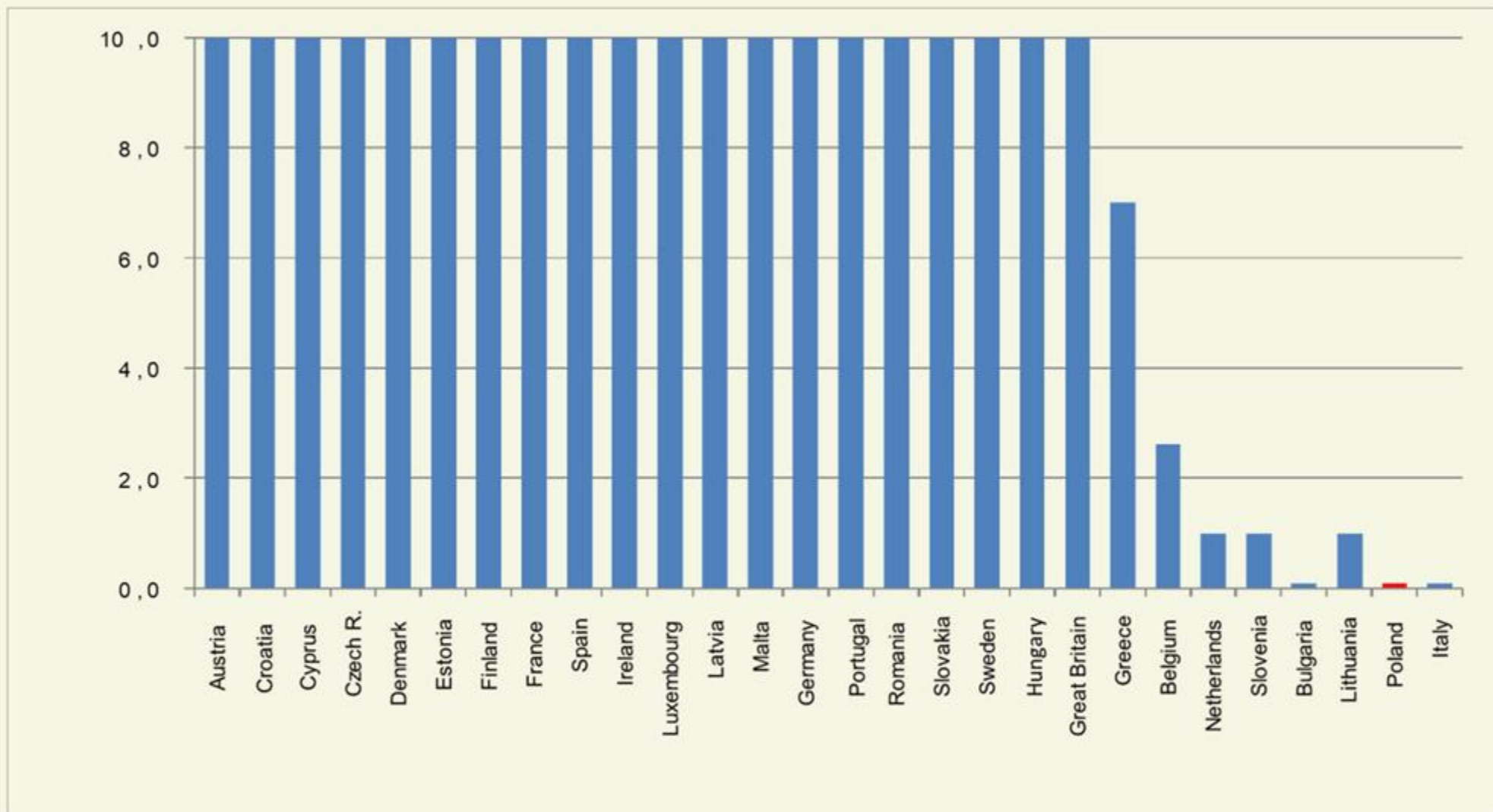
KEY ISSUE

Polish exposure limit for the general public for the 300 MHz - 300 GHz frequency is **0.1 W/m² (6,14 V/m)**

Since ICNIRP reference levels above 10 MHz are between 2 (27,45 V/m) and 10 W/m² (61,4 V/m), Polish levels are from **20 to 100 times more restrictive**.

Polish exposure limit such as **0.1 W/m² (6,14 V/m)** may lead to the following consequences:

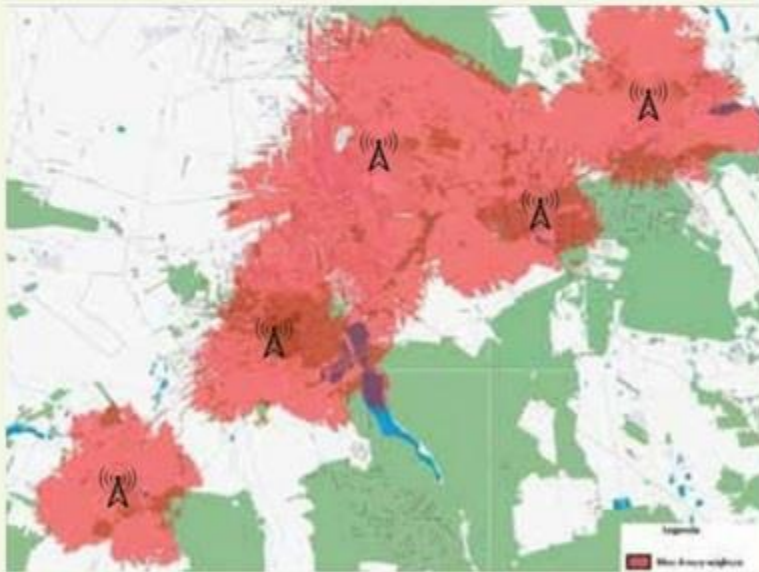
- Limited range of the base station grids
- The necessity to build much denser net of base stations (cost inefficient) and thus enforce increase of oversized investments costs
- Inability to share with existing technologies



Source: Acceptable levels of electromagnetic fields in the European Union countries - on the example of frequencies greater than 2 GHz. Source: PIIT on the basis of the Commission Report on the application of Council Recommendation 1999/519/EC

KEY ISSUE

Example of how same/larger areas can be covered with a smaller number of base stations with EC recommended EMF exposure limits (red) versus restrictive limits (purple)



Source: Arbitrary Radio Frequency exposure limits: Impact on 4G network deployment Case Studies Brussels, Italy, Paris and Poland, GSMA.

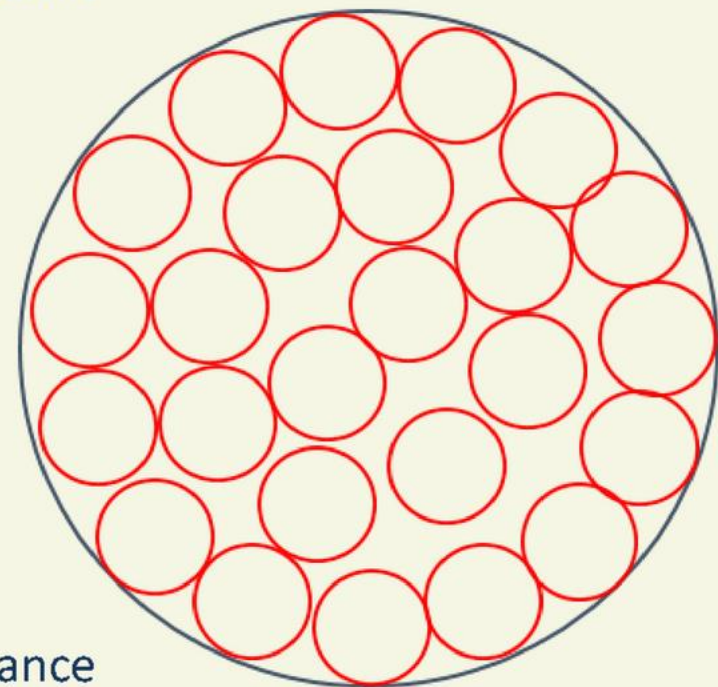
KEY ISSUE

Lower exposure limits (10 W/m^2 vs. 0.1 W/m^2) will cause the 5G cell range degradation (app. from 280m to 56m respectively) due to the required transmit power reduction.

Difference in the cell surface area for:

————— 10 W/m^2 (61,4 V/m)

————— 0.1 W/m^2 (6,14 V/m)



With a 5G radio operating in 28 GHz, in most EU countries the acceptable distance of human from the transmitter would be app. 1,1 m, while in Poland 10 times higher.

PLANNED ACTIONS TO EASE THE RESTRICTIONS

- Supporting scientific research conducted by leading research centers in the country
- Promotion of information activities to combat disinformation about electromagnetic radiation
- Permanent environmental monitoring by the Institute of Communications - National Research Institute, and state environmental agencies
- Promotion and support of scientific initiatives, conferences, etc. on electromagnetic radiation
- Preparing the ground for legislative changes

PLANNED ACTIONS TO EASE THE RESTRICTIONS

- Strengthening the powers of government agencies in the field of environmental control and monitoring regarding the impact of the electromagnetic field;
- Introduction of environmental qualification for the construction and modernization of base stations (BTS);
- Appropriate adjustment of the permitted electromagnetic field limits in the environment to the requirements of modern mobile communication networks;
- Introducing amendments to the Environmental Protection Law and to other acts - in the context of the 5G network.
- Launching a government information portal on the impact of the electromagnetic field and conducting information campaigns.



Conclusion

**IN ORDER TO SUCCESSFULLY ROLL-OUT 5G IN
POLAND A CLOSE COOPERATION IS REQUIRED.**

This means a broad cooperation between government administration, telecommunications operators, chambers of commerce, service providers, telecommunications equipment and solutions, research and development institutions, technical universities and Polish start-ups.

THANK YOU!

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