

/ Short report on Flanders' activities related to EMF

In Belgium, regional governments are responsible for the policy on electromagnetic radiation, and this report was prepared by the Flemish Environment Department, responsible for the electromagnetic policy in Flanders, the northern region of Belgium.

1. Research activities related to EMF radiation and health

Continuous

Expert support EMF radiation: This ongoing activity establishes a multidisciplinary expert group, in order to gather knowledge on EMF and to support our department. The group currently consists of research institutions imec, Ghent University and Sciensano. They monitor and interpret (international) research into possible health effects of EMF and new wireless technology, applications that use EMF and related changes in exposure to EMF.

Completed

More effective deployment of RF sensors for monitoring trends in radiation exposure:

This study describes the development and implementation of an integrated methodology to model spatial and temporal patterns in electromagnetic field exposure, based on a combination of simulations and measurement data in the city center of Ghent. Simulations across multiple frequency bands, combined with LOS/NLOS analysis, were used to determine optimal sensor locations and identify hotspots, resulting in a network of 19 sensor units. Classical geostatistical interpolation techniques proved insufficiently robust, leading to the development of the heuristic Mean-Matched Gradient-Preserving Optimization (MMGPO) method, which corrects simulations while preserving spatial gradients. The results show that the inclusion of measurement data substantially improves the quality of the exposure maps. In this context, four types of data sources are combined (nodes, exposimeter, spectrum analyzer on a bicycle, and ray-tracing simulations). Temporal analysis reveals significant variations across different time scales, including a marked increase in exposure in the 3.6 GHz band due to 5G deployment, with changes primarily reflected as shifts in median levels rather than alterations in spatial patterns.

Pilot project monitoring ELF: The Environment Department, in collaboration with imec, developed sensor boxes that measure magnetic fields from high-voltage transmission lines and substations. The boxes were extensively tested by deploying them in the field over extended periods. This long-term testing allowed both the evaluation of the sensor boxes' performance and the implementation of targeted optimizations.

In the pilot project, sensor boxes were installed at 15 locations across 11 municipalities, in the vicinity of 8 different 380 kV high-voltage transmission lines. The results demonstrate that the sensor boxes can accurately measure magnetic fields from high-voltage transmission lines. The system is now ready to be rolled out as a Flemish monitoring network for magnetic fields from high-voltage transmission infrastructure.

In progress

Measurement study on different sources of RF [expected summer 2026]: In the first part, we focus on the portion of exposure coming from different sources, such as digital gas and water meters, private 5G networks in hospitals, wifi in a school, train station, event halls, ... In the second part, we study the average exposure of an individual in

