

WHO International EMF Project

Report on national activities in Belgium for 2010-2017

1. GENERAL RESEARCH ACTIVITIES RELATED TO EMF HEALTH

BBEMG

The Belgian BioElectroMagnetic Group (BBEMG), created in 1995, includes Belgian researchers from three universities (Liège, Gent, Brussels) and one research institute (Brussels) involved for several years in the study of health effects of extreme low frequency electromagnetic fields. This work is supported by a grant from ELIA (the electrical industry). In the framework of a research program for 2009-2013 further studies of biological effects have been done including studies on genetic damage that is expected to be associated with Alzheimer's disease and ELF-MF exposure (**L. Verschaeve, A. Maes, R. Anthonissen**, Scientific Institute of Health, Brussels); in-vitro studies on the effects of ELF on cell differentiation, tissue responses and activated genes (**M. Hinsenkamp, J-F Collard**, University of Brussels); electromagnetic modelling of contact currents in the human body (**C. Geuzaine, V. Beauvois**, University of Liège), electromagnetic hypersensitivity (**M. Ansseau, G. Scantamburlo, C. Rocha**, University of Liège); review of epidemiological studies (**M. De Ridder, L. Braeckman**, Ghent University).

A number of ad-hoc projects are supported by fundamental research grants and by the governmental institutions:

The Wireless & Cable group (WICA) of iMinds – Ghent University

The Wireless & Cable group of the Ghent University (**L. Martens, W. Joseph**) is involved in several national and international projects related to technical aspects of the interference of electromagnetic radiation and humans. In 2010 the evaluation of public exposure from anti-theft devices in the shops and libraries has been done. This work has been supported by the Federal ministry of Public Health, Food Chain Safety and Environment.

Recently (2012-2013), the I-Minds (WiCaA group) performed a measurement campaign to determine the level of exposure to radiofrequency fields of 'old' (e.g. GSM, UMTS) and 'new' (e.g. LTE) technologies in houses, offices and public places in Flanders. In addition, exposure to electromagnetic fields of Wi-Fi antennas in schools was determined. In another study (2013), WiCa I-Minds investigated the possibility to reduce exposure to EMF-fields of wireless communication devices and antennas. WiCa I-Minds explored opportunities to optimize existing technologies as well as new technologies and networks to reduce exposure to EMF-fields. Both studies were steered and commissioned by the Flemish government and can be found at www.lne.be/zendantennes (2013-2014). WiCa also compared personal exposures in different countries in 2010 and personal absorptions in different countries in 2012, and made procedures for in-situ assessment of Wi-Fi (2010) and actual Wi-Fi duty cycles (2013). WiCa was and is also involved in the European FP7 projects SEAWIND, LEXNET, and GeRONIMO (start 2014).

Ghent University (WICA group) and University of Antwerp (UA)

In collaboration two universities organized a consultation of experts and stakeholders (**L. Martens** and **W. Joseph** of Wica, **I. Loots** and **L. Goorden** of the UA) to discuss possible health risks and policy options of exposure to ELF fields (2010-2011). The study was steered and commissioned by the Department of Environment, Nature and Energy of the Flemish government.

GD-EMF-Consulting Ltd

Long and short exposure assessment studies (**G. Decat**) have been performed in the different sectors (bank, insurance, food, clinical, industrial and school) in order to estimate the static, ELF and RF-fields to which workers and visitors might be exposed under normal and specific working conditions. Different measurement campaigns in order to estimate the indoor and outdoor dual 2.4/5 GHz WIFI-exposure distributions in cities were performed too. These studies were sponsored by the city of Bruges and ZapFi respectively.

VITO (Flemish Institute for Technological Research) and GD-EMF-Consulting

Recently a study was completed about the GIS-modeling of the 50 Hz magnetic field of High Voltage Transmission Lines, Transformation stations and Transformation Cabins in Flanders (**L. Van Esch**, VITO, **G. Decat**, GD-EMF-Consulting, and **G. Engelen** (VITO). A GIS model was developed to determine the exposure of the population for different cut off points (0,4 and 10 μ T). The model also has a 3D component. A few scenarios (policy options, including feasibility and cost) were investigated. The study is steered and commissioned by the Flemish government (2012-2014).

IMEC, ULB

In 2012-2014 a GIS model was developed for the simulation of the 50 Hz magnetic field of High Voltage Transmission Lines (see above). In 2016 and 2017, the GIS model will be adapted to make the calculation more precise regarding the different configurations of the High Voltage Transmission Lines. The model is used for spatial planning and to answer questions of people living near powerlines. The study is steered and commissioned by the Flemish government (2017).

Ghent University (WICA group and UZ), Scientific Institute of Public Health

In 2013, a new study (**L. Verschaeve, Luc Martens**) has been launched with the aim of: expert advice on the development of new wireless technologies and applications, and the change of exposure and expert advice on research into possible health effects of RF radiation. The study is steered and commissioned by the Flemish government (2013-2015).

IMEC, WIV, UZGent

Continuation of the expert advice on the development of new wireless technologies and applications, and the change of exposure and expert advice on research into possible health effects of RF radiation. These reports are published on a public site (www.lne.be/zendantennes). Measurements are also made to validate simulation and used attenuations in the calculation tool to perform attestation for antennas of operators. The study is steered and commissioned by the Flemish government (2016-2018).

Catholic University of Leuven

In 2015 – 2016 a study was performed of the exposure levels generated by GSM and UMTS in the city center of Leuven. The focus was on the variation of the levels over the time span of one day. The reproducibility after one month was also checked. This research was supported by university research funds.

The report is composed by the Federal Ministry of Public Health, Food Chain Safety and Environment, DG Environment in collaboration with the Department of Environment, Nature and Energy of the Flemish Region, the Directorate-General of Agriculture, Natural Resources and Environment of the Walloon Region, the Brussels Institute for Environment of the Brussels-Capital Region and Belgian scientists.

The Health Council

The Health Council has issued several advisory reports to policy makers.

2. NEW POLICIES AND LEGISLATIONS REGARDING EMF EXPOSURE

Radio frequency:

New Belgian legislation : AR of 20 May 2016 on protection of health and security of workers against risks arising from electromagnetic fields (transposition of the European Directive 2013/35/UE).

Radio frequency (base stations)

The regional authorities are empowered to this matter. Since 2009, an ordinance is applicable in the *Brussels-Capital Region* for a broad spectrum of electromagnetic fields, from 100 kHz to 300 GHz (except certain TV- and radio transmitters), including the radiation from cellular phone base stations. This ordinance limited limits the electromagnetic field to 3 V/m (at 900 MHz) at all public accessible places. This ordinance was modified in 2014 in order to increase that norm to 6V/m. In the *Flemish Region*, exposure standards for electromagnetic fields between 10 MHz and 10 GHz are included in the Flemish environmental regulation (VLAREM). An exposure standard of 20.6 V/m at 900 MHz is applicable at all public accessible places. In addition, an exposure limit per antenna of 3 V/m (at 900 MHz) is applicable for antennas of mobile operators in dwelling places (indoor, schools including playgrounds).

The Flemish government developed a new webtool to provide certificates of conformity for antennas (RF) in Flanders (2017). The use of antennas is prohibited without an attest delivered by the Flemish government. The new tool uses GIS technology so operators can indicate the location of antennas on a map. Information about buildings and terrains is then uses to calculate the exposure in de vicinity. Only if the standards are met, the operator receives an attest with the calculations. The attests are also published on a public map.

Radio frequency (mobile phones)

Implementing a resolution of the Federal Parliament adopted in 2009, the *Federal Government* has published Royal Decrees containing an obligation for suppliers and sellers to provide a SAR value together with a mobile phone. Also there is a prohibition for advertising of use of mobile phones by young children and a ban of mobile phone especially designed for them. The texts of Royal Decrees are available: In English: http://www.health.belgium.be/eportal/19089508_EN ; In French: http://www.health.belgium.be/eportal/19089508_FR

Extremely Low Frequencies

As for the electromagnetic fields from electricity grids (50 Hz), Belgium in general accepts the ICNIRP recommendation. In addition to an indoor quality standard (an intervention value of 10 μ T and a guide value of 0.2 μ T) in *Flemish region*, the *Flemish Government* recommends for new overhead high voltage transmission power lines to avoid or minimize the construction of new HV transmission power lines (HVP) near to schools, kinder gardens e.g., not to build new schools, kinder gardens e.g. within the 0.4 μ T zone of existing HVP lines and to compensate the economic loss of houses/building land in the zone with building limitations of new overhead HVP lines.

In the *Region of Brussels* magnetic fields are managed only via the environmental permits with one or several transformers. Usual values of magnetic field to be respected are 100 μ T in permanent exposure and 1000 μ T in short-time exposure. A special condition is added for permanent exposure in the case of new transformers, i.e. a guideline value of 0.4 μ T and a limit value of 10 μ T (value depending on balance between the precautionary principle and the proportionality principle). Those should be respected in all places where children under 15 are likely to stay over long period (homes, schools, nurseries, hospitals).

3. AREAS OF PUBLIC CONCERN AND NATIONAL RESPONSES

The public has concerns about exposure from the mobile phone base stations, a possible risk for brain cancer among heavy users of mobile phone, exposure from wireless networks at schools, exposure to magnetic fields of 50 Hz from power lines. The national responses are described in part 4.

4. NEW PUBLIC INFORMATION ACTIVITIES

The federal government:

- In 2010, the Federal Ministry of Health, Food chain safety and Environment has published a brochure "Mobile phone and health" (available in French and Dutch) and a revised brochure "Electromagnetic fields and health: your guide in electromagnetic landscape" (available in French, Dutch, German). A number of fact-sheets on frequently asked questions are prepared. The ministry collects and answers to the questions of the public, the associations and the federal politics about the EMF.

The government of the Brussels Capital Region:

- A map of all the locations of antennas is accessible online where the technical data of each installation is listed. The environmental permits/limits are also available online (www.environnement.brussels). Every people can ask for a control measurement, free of charge.
- An experts comity has been established to assess the implementation of the Brussels legislation. It submits annually a report to the regional government intended to be made public.

The report is composed by the Federal Ministry of Public Health, Food Chain Safety and Environment, DG Environment in collaboration with the Department of Environment, Nature and Energy of the Flemish Region, the Directorate-General of Agriculture, Natural Resources and Environment of the Walloon Region, the Brussels Institute for Environment of the Brussels-Capital Region and Belgian scientists.

The government of the Walloon Region:

- A map of all the antenna locations that require an environmental declaration is accessible online on www.sites.bipt.be. A copy of the control reports (theoretical and onsite if relevant) is listed and includes the technical data. Each neighbour (up to 200 m) of an antennas site can ask for a control of his house, free of charge.
- The Permanent Environment-Health Unit (Cellule Permanente Environnement-santé) collects and answers to the questions of the population, the associations, the industrials and the Walloon politics about the EMF and other transversal matters. The unit formulates proposals for initiatives in various environmental matters, including the EMF.

The government of the Flemish Region:

- A new map of all the sites with antennas of mobile operators in Flanders can be found on www.lne.be/zendantennes. sites can be found through search by address. The conformity attests can be downloaded by clicking on a site (2013 - 2014). People who live near antennas can ask for a control measurement, free of charge.
- The Flemish government, the Flemish Institute for Health Promotion and Disease Prevention, the Agency for Care and Health and the Local Health Authorities (Logo) organized provincial information sessions for local actors (2011). An information map about antennas and other wireless applications was developed (2011). This map is updated annually. Assistance was also provided to a campaign organized by the Department of Education about wireless technologies in schools (2012), in response to questions from schools, educators and parent about applying wireless technology in schools. The Logo assists the local authorities with exhibition banners, an electrical box and other information. The Department of Environment, Nature and Energy of the Flemish government put online a site for schools and a site for local authorities that can be found on www.lne.be/zendantennes (2013).
- The Flemish government provides information about ELF and RF EMF for the general public, local authorities and schools (www.lne.be/zendantennes and www.lne.be/hoogspanning).
 - Questions about EMF (RF, ELF) are recorded in a registration system.