WHO International EMF Project
Report on national activities in Belgium for 2010-2013

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 ELFs 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 (WilCaA 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 investigates the possibility to reduce exposure to EMF-fields of wireless communication devices and antennas. WiCaI-minds explores 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. 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 WiFi duty cycles (2013). WiCa was and is also involved in two European FP7 projects SEAWIND and LEXNET.

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 workers and visitors might be exposed to 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 (Flemisch Institute for Technological Research) and GD-EMF-Consulting

Recently a new study has started 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 few scenarios (policy options, including feasibility and cost) will be investigated such as the most efficient magnetic field mitigation techniques/possibilities about the installation(s) of concern in order to avoid exposure levels exceeding the cut-off of 0.4 µT. The study is steered and commissioned by the Flemish government.

Scientific Institute of Public Health

The Scientific Institute of Public Health (**L. Verschaeve**) has made an overview and evaluation of the conclusions of 33 different (inter)national expert groups that were devoted to health effects of radiofrequency fields and that were published in the period 2009-2011. The study was steered and commissioned by the Flemish government. Literature reviews (in Dutch) on impact of electromagnetic fields on environment were prepared: for the Flemish government, in collaboration between **L. Verschaeve, L. Martens**, **W. Joseph**, **D. Adang**, **G. Decat**, **E. Brits** and **M. Bossuyt**) and for Global Operator Forum, in collaboration between **L. Verschaeve** and **L. Bervoets** (UA).

Catholic University of Leuven and University of Brussels (ULB)

A study on the effects of short-term GSM radiation at representative levels in society on a biological model of the ant species Myrmica Sabuleti is performed (**M-C. Cammaerts**, **G.Vandenbosch**, **V. Volski**), supported by university research funds.

The Health Council

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

2. NEW POLICIES AND LEGISLATIONS REGARDING EMF EXPOSURE

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 limits the electromagnetic field to 3 V/m (at 900 MHz). In the *Walloon Region* a decree limits the electromagnetic field to 3 V/m per antenna. 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).

Radio frequency (mobile phones)

Implementing the resolution of the Federal Parliament adopted in 2009, the *Federal Government* has developed a project of Royal Decree containing an obligation for suppliers and sellers to provide a SAR value together with a mobile phone. There is also an intention to prohibit the advertising of use of mobile phones for young children as well as the marketing of mobile phone especially designed for them.

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 µT and a guide value of 0.2 µT) 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 µT 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 µT in permanent exposure and 1000 µT 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 µT and a limit value of 10 µT (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.ibgebim.be).

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 map of all the sites with antennas of mobile operators in Flanders can be found on www.sites.bipt.be. The conformity attests can be downloaded by clicking on a site.
- The Flemish Agency for Care and Health distributes a leaflet on the use of mobile phones by children "Mobile danger? Your child is/is not at risk by calling with a mobile phone".
- The Flemish government, the Flemish Institute for Health Promotion and Disease Prevention, the Agency for Care and Health and the Local Health Authorities (Logo) organised provincial information sessions for local actors (2011). An information map about antennas and other wireless applications was developed (2011). Assistance was also provided to a campaign organised 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 Loco assists the local authorities with exhibition banners, an electrical box and other information.
- 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).

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.