



Exposure guidelines for electric and magnetic fields (EMF)

Canadian exposure guidelines for extremely low frequency (ELF) electric and magnetic fields (EMF) from power lines

Both electric and magnetic fields are strongest at the source – whether it is a power line or an electrical appliance such as a hair dryer, or dishwasher – and decrease rapidly as you move away from the source. Magnetic field exposure from power lines depends primarily on the magnitude of current the wires carry and an individual's distance from the lines. While electric fields are easily shielded by trees, fences and other materials that are capable of conducting electricity, magnetic fields pass through most objects.

In Canada, there are no guidelines or standards pertaining to acceptable levels of residential exposure to extremely low frequency (ELF) electric and magnetic fields (EMF), due in large part to the fact that there is no established correlation between low frequency EMF and chronic health effects.

Health Canada's *It's Your Health* fact sheet on *Electric and Magnetic Fields from Power Lines and Electrical Appliances* states that "Health Canada does not consider that any precautionary measures are needed regarding daily exposures to EMFs at ELF's. There is no conclusive evidence of any harm caused by exposures at levels found in Canadian homes and schools, including those located just outside the boundaries of power line corridors."¹

It should be noted that for the design and construction of buildings located at the edge of electricity transmission rights of way (500 kV and above) further study to manage electric field impacts, including the risk of induction shocks, may be required. It is the responsibility of the developer to ensure that no part of the building is exposed to electric fields greater than 5kV/m ([IEEE standard C95.6-2002](#)). For further information, refer to [CSA C22.3 No. 1-06, Clause 5.7.3.3](#).

¹ Health Canada, "*Electric and Magnetic Fields from Power Lines and Electrical Appliances*," [Government of Canada](http://www.hc-sc.gc.ca/hl-vs/alt_formats/pdf/iyh-vsv/envIRON/magnet-eng.pdf) <http://www.hc-sc.gc.ca/hl-vs/alt_formats/pdf/iyh-vsv/envIRON/magnet-eng.pdf> (November 2012, Accessed: November 2015): 2.





There are also international guidelines that aim at preventing non-chronic health effects of ELF EMF exposure, such as shocks as well as the stimulation of nerves and muscles. It should be noted that these generally do not occur in areas accessible to the public, nevertheless, to learn more please click here (Link to page 5).

Exposure guidelines for radio frequency (RF) from Smart Meters

Health Canada notes that “At present, there is no scientific basis for the occurrence of acute, chronic and/or cumulative adverse health risks from (radio frequency) RF field exposure at levels below the limits outlined in Safety Code 6.”²

As no chronic health effects are known to be caused by exposure to RF waves, there are no specific limits aimed at preventing or limiting this exposure. However, Health Canada’s [Safety Code 6](#) addresses the issue of tissue heating and nerve stimulation that **has** been observed as a result of acute exposure to RF waves at levels far above those associated with Smart Meter.

It is important to note that Smart Meter only emit RF waves intermittently, and for short durations, especially when compared to mobile phones and other related devices. In addition, the BC Ministry of Health has found that Smart Meter emit very low levels of power, and are generally relatively far from individuals, thus making the RF signal drop to less than 0.001 per cent (0.005 $\mu\text{W}/\text{cm}^2$) of the original Health Canada Safety Code 6 exposure limits. Thus, one can expect much lower RF exposure rates from Smart Meter than from other sources such as cell phone use.³

Further, the World Health Organization (WHO) has concluded that: “To date, no adverse health effects have been established as being caused by mobile phone use.”⁴ These facts support the Canadian Electricity Association’s (CEA’s) conclusion that there are no significant adverse health effects that result from Smart Meter.

² Consumer and Clinical Radiation Protection Bureau, “Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 KHZ to 300 GHZ” [Health Canada](http://www.hc-sc.gc.ca/ewh-semt/consult/_2014/safety_code_6-code_securite_6/final_finale-eng.php) <http://www.hc-sc.gc.ca/ewh-semt/consult/_2014/safety_code_6-code_securite_6/final_finale-eng.php> (June 22, 2015, Accessed: December 2015): 2.

³ Office of the Provincial Health Officer, “Smart Meter and Cancer Risk Statement” [BC Ministry of Health](http://www2.gov.bc.ca/gov/content/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/current-health-topics/smart-meter-and-cancer-risk-statement) <<http://www2.gov.bc.ca/gov/content/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/current-health-topics/smart-meter-and-cancer-risk-statement>> (December 2011, Accessed: November 2015).

⁴ WHO, “Electromagnetic fields and public health: mobile phones” [World Health Organization](http://www.who.int/mediacentre/factsheets/fs193/en/) Factsheet no. 193 <<http://www.who.int/mediacentre/factsheets/fs193/en/>> (October 2014, Accessed: November 20, 2015).

