

## What is EMF?

EMF is created by anything that conducts electricity, including transmission lines, household appliances and computers. EMF consists of two different types of fields: Electric fields, which are produced by electric voltage, and magnetic fields, which are produced by electric current.

The EMF values for transmission lines and the electric items we use daily are called extremely low-frequency (ELF) fields. ELF is different from the frequency fields associated with radio waves, TV waves and cell phone signals, which have a much higher frequency.

## Where is EMF found?

EMF surrounds any electrical appliance or wire that can conduct electricity. You are exposed to these fields at home when you turn on a lamp, use a computer, or heat up food in a microwave. We also encounter a wide variety of EMF in other ways – the earth’s atmosphere, thunderstorms, and earth’s core all produce electric or magnetic fields.

EMF is strongest closest to their source, so the farther away you are from the source, the less EMF reaches your body. Below is a list of some common appliances and machines and the magnetic field levels found nearby.

	Magnetic field 6 inches from appliance (mG)	Magnetic field 2 feet away (mG)
<b>Electric shaver</b>	100	-
<b>Vacuum cleaner</b>	300	10
<b>Dishwasher</b>	20	4
<b>Microwave oven</b>	200	10
<b>Hair dryer</b>	300	-
<b>Computers</b>	14	2
<b>Fluorescent lights</b>	40	2
<b>Copy machines</b>	90	7
<b>Garbage disposals</b>	80	2

*Source: National Institute of Environmental Health Services / National Institutes of Health: EMF Associated with the Use of Electric Power*

## What EMF levels are found near transmission lines?

Because EMF levels drop as you move away from the source, exposure to EMF from transmission lines is reduced significantly by the distance from the lines. Magnetic fields from transmission lines at the edge of the right-of-way during normal operating conditions are typically lower than common household items.



## What are electric and magnetic fields?

**Electric fields**, measured in kilovolts per meter (kV/m), are created by voltage – the higher the voltage, the stronger the field. Anytime an electrical appliance is plugged in, even if it isn't on, an electric field is created around it. But these fields are easily blocked by walls, trees, and even your clothes and skin. Electric fields become weaker as you move away from the source.

**Magnetic fields**, measured in milliGauss (mG), are produced by electric current and only exist when an electric appliance is turned on – the higher the current, the greater the magnetic field. The strength of a magnetic field dissipates rapidly as you move away from its source. Unlike electric fields that are easily blocked by ordinary materials, magnetic fields do not interact with and are not affected by walls and clothes and other barriers.

## What are 'typical' residential exposures to magnetic fields?

Exposure levels may vary from individual to individual and from home to home, but a study by the Electric Power Research Institute (EPRI) puts the background levels of power line magnetic fields in the typical U.S. home at between 0.5 mG and 4 mG with an average of 0.9 mG. Levels rise the closer you are to the source of the field. Most people are exposed to greater magnetic fields at work than in their homes.

## Is EMF harmful to health?

This issue has been studied for more than 30 years by government and scientific institutions all over the world. Several scientific organizations, including the American Medical Association, American Cancer Society, American Physical Society and National Academy of Sciences, have stated that the body of evidence in regard to ELF-EMF, particularly magnetic fields, indicates that exposure to these fields does not present a human health hazard. EMF exposure from transmission lines, which are high in the air and inside the negotiated easement, is minimal. An article titled *Adult Cancers Near High-voltage Overhead Power Lines* provided the following conclusion from a 2012 study, "our results do not support an epidemiologic association of adult cancers with residential magnetic fields in proximity to high-voltage overhead power lines."

## Are there state or federal standards for EMF exposure?

Health standard authorities have not established national limits on EMF exposure due to inconsistent study results. The EMF levels produced by appliances vary from manufacture to manufacturer and model to model. The designs of many newer model appliances, in general, often produce lower fields than older models. There is no federal certification program on EMF levels so beware of advertisements on appliances making claims of federal government certification of low or zero EMF levels.

## Contact information

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