NATIONAL WILDLIFE FEDERATION

Electromagnetic Fields and Transmission

To increase the reliability and resiliency of a clean power grid, we are committed to responsibly upgrading and expanding the power grid for people and wildlife.

What are EMFs?

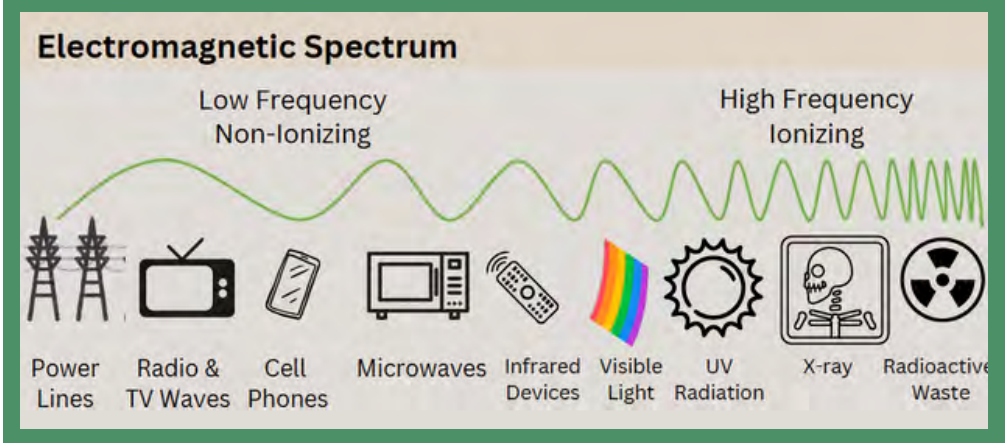
Electromagnetic fields (EMFs) are made of invisible electric and magnetic fields. These fields are generated by stationary electric charges and by electric currents that produce magnetic fields.

EMFs can occur naturally, such as in the Earth's geomagnetic field and during thunderstorms, or they can be created by human-made sources like power lines. The characteristics of an EMF depend on factors such as the strength and orientation of the electric or magnetic fields, as well as the the rate at which the waves fluctuate.

There are two types of EMFs:

- **Ionizing Radiation:** This type includes X-rays and other high-frequency waves. Prolonged exposure to ionizing radiation is harmful and can cause cellular and DNA damage.
- **Non-Ionizing Radiation**: This includes radio waves and power lines, which are low-frequency and do not cause cellular or DNA damage.

Power lines have been installed, operated, and maintained for almost 150 years. These cables emit low frequency, non-ionizing radiation. This type of EMF falls on the non-harmful side of the electromagnetic spectrum. According to the National Cancer Institute at the National Institutes of Health, there is no proven link between cancer and non-ionizing radiation.[1] More research is needed to determine how wildlife species encounter and perceive EMFs throughout their lifetime.

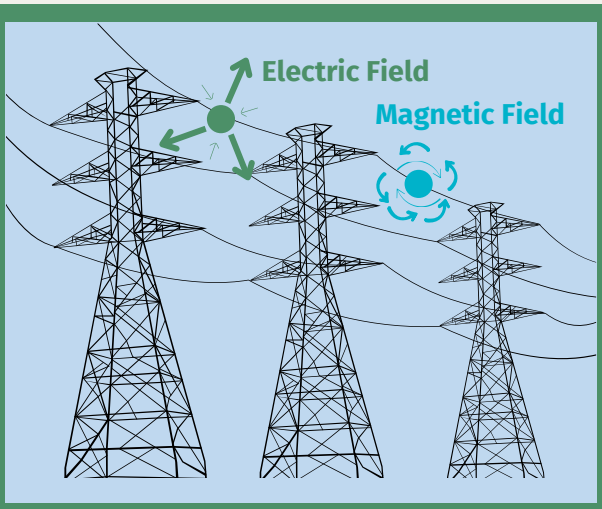


Potential Impacts

- **The World Health Organization has concluded that there is no current evidence to support the existence of any health consequences from exposure to low level electromagnetic fields in humans.**[2]
- **Animals sensitive to electromagnetic fields may have their navigation or hunting behaviors disrupted when in close proximity to power lines.**[3]
- **There is a concern that artificial EMFs might interfere with animals' ability to perceive natural signals.**[4]
- **There has been no indication that wildlife behavioral responses will translate to negative impacts.**[5]
- **Further studies are needed to determine if EMFs from power lines significantly impact the survival and behavior of these species.**

Mitigation Measures

- ✓ **Limiting the time spent in direct proximity to EMF sources can lower exposure.**
- ✓ **Increasing the height at which new transmission lines are built will lower EMF exposure on the ground, which is also the process for increasing transmission capacity.**
- ✓ **Constructing transmission lines with conductors closer together causes the fields to interfere with each other reducing the overall EMF emitted from the transmission line, while still being mindful of spacing needed to address avian collision risks.**



Learn More at www.nwf.org/transmission

Sources

1 *Electromagnetic Fields and Cancer*, National Cancer Institute, (last accessed Sept. 10, 2024), https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet. *See EMF Electric and Magnetic Fields Associated with the Use of Electric Power,* National Institute of Environmental Health Sciences and National Institutes of Health (June 2002), https://www.niehs.nih.gov/sites/default/files/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf.

2 *Radiation: Electromagnetic fields*, World Health Organization (WHO) (Aug. 4, 2016), https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields#:~:text=Based%20on%20a%20recent%20in,exist%20and%20need%20further%20research.

3 Blanka Pophof et al., *Biological Effects of Electric, Magnetic, and Electromagnetic Fields from 0 to 100 MHz on Fauna and Flora: Workshop Report 124 Health Phys. 39-52 (Nov. 3, 2022), 10.1097/HP.0000000000001624*.

4 EMF Electric and Magnetic Fields Associated with the Use of Electric Power, National Institute of Environmental Health Sciences and National Institutes of Health (June 2002), https://www.niehs.nih.gov/sites/default/files/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf.

5 *Id.*