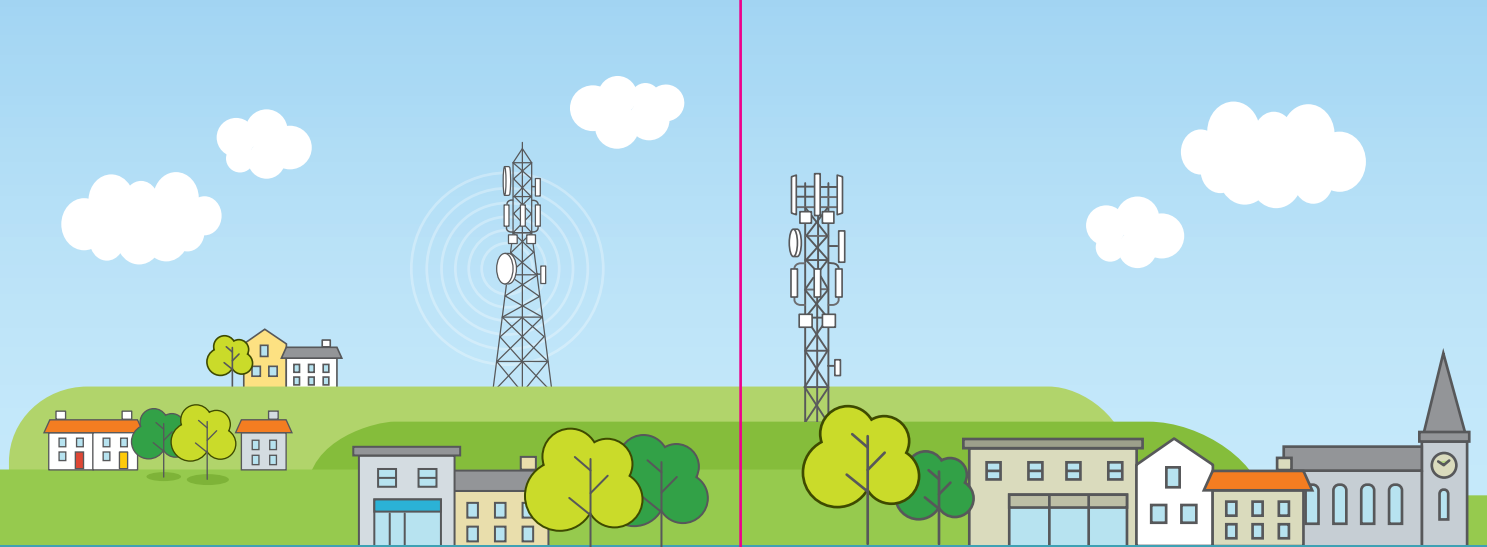
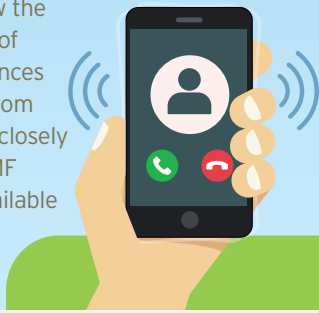


# 5G AND HEALTH

The effects of RF EMF, including the frequencies used and envisaged for 5G, have been subject to significant research. No health effects have been shown at levels below the ICNIRP guidelines for members of the public, as such no consequences for public health are expected from exposure to 5G. The EPA works closely with the WHO's international EMF Project, and will monitor the available evidence to ensure our advice remains current.



The International Agency for Research on Cancer (IARC) Carcinogenicity Groups and Examples		
Group	Description	Examples
1	(Known) carcinogenic	Ionising Radiation Smoking UV Radiation Air Pollution Alcoholic Drinks
2A	Probably carcinogenic	Night work Red Meat Very Hot Drinks DDT/ Pesticides Hairdresser/ Barber
2B	Possibly carcinogenic	Radio Frequency Fields Power Frequency Magnetic Fields Aloe Vera Pickles Dry Cleaning
3	Not classifiable	Caffeine Tea Acrylic Fibres Power Frequency Electric Fields Static Electric & Magnetic Fields

NOTE: Both radio frequency fields and extremely-low (power) frequency magnetic fields were classified as 2B based on evidence for relatively high exposure levels. More examples can be found here: <https://monographs.iarc.fr/agents-classified-by-the-iarc>

The International Agency for Research on Cancer, a WHO agency, classified RF EMF as “possibly carcinogenic”, or class 2B. This classification was mainly based on studies of long-term, heavy use of mobile phones. 2B classification includes substances for which evidence of carcinogenicity is limited and further research is needed. Many chemicals (e.g. those used in dry cleaning) and some products (e.g. talcum powder, pickled food) are also classified as 2B.



## ELECTROMAGNETIC FIELDS, 5G AND HEALTH

For more information contact:

**Environmental Protection Agency (EPA), Ireland**  
 PO Box 3000,  
 Johnstown Castle Estate,  
 Wexford, Y35 W821

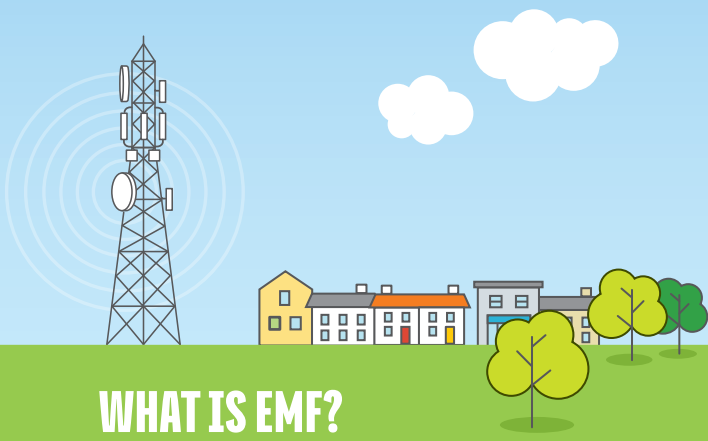
Email : [emf@epa.ie](mailto:emf@epa.ie)  
[www.epa.ie/radiation/emf](http://www.epa.ie/radiation/emf)

WHAT IS 5G?

WILL IT INCREASE EXPOSURE?

ARE THERE RISKS?

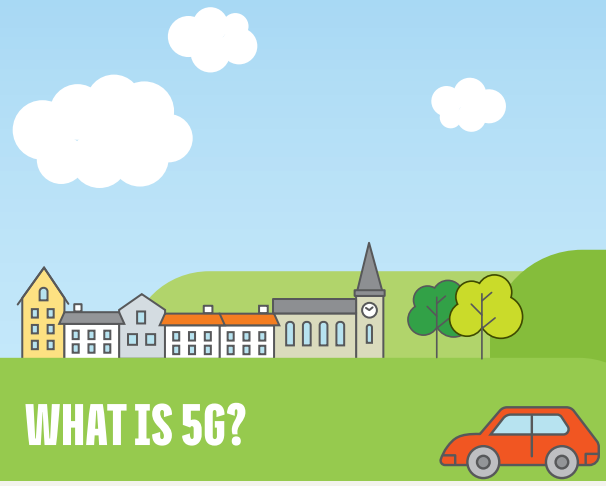
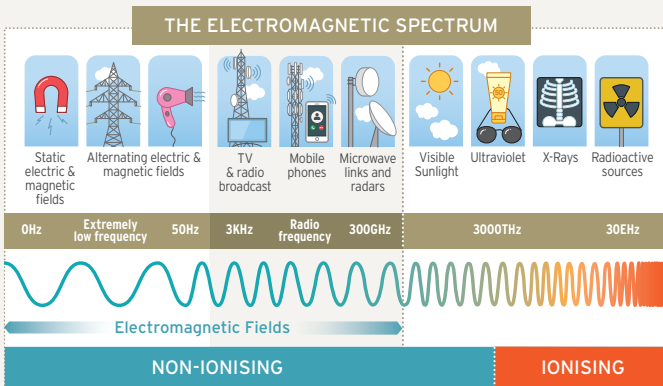




## WHAT IS EMF?

Electromagnetic fields or EMF are a form of non-ionising radiation, which together with optical and ionising radiation comprise the electromagnetic spectrum.

EMF range from static fields, with 0 Hertz (or cycles/sec) to radiofrequency (RF) EMF (up to 300 Giga Hertz, GHz). RF EMF has been used for telecommunication since the invention of the radio in 1895. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) issues guidelines to limit exposure to EMF and protect workers and the public from potential harmful effects. The ICNIRP guidelines are endorsed by the World Health Organization (WHO) and the European Commission.



## WHAT IS 5G?

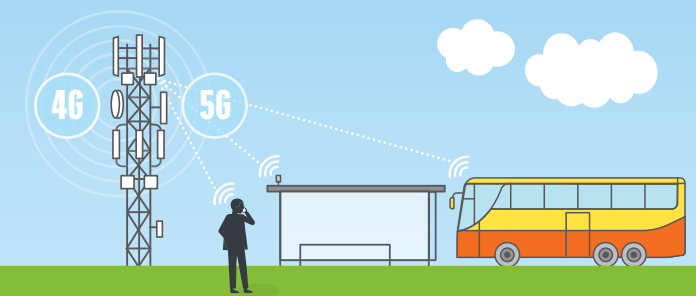
**5G** is the 5th generation of wireless telecommunication technology.

**5G** is being introduced throughout Europe in line with the 5G Action Plan published in 2016 by the European Commission setting out a timetable for its deployment in EU member states.

**5G** complements previous mobile technologies (2G, 3G & 4G) and aims to improve connectivity, allowing for new applications such as e-health, smart energy networks or smart farming.

**5G** uses radiofrequency EMF in the frequency bands:

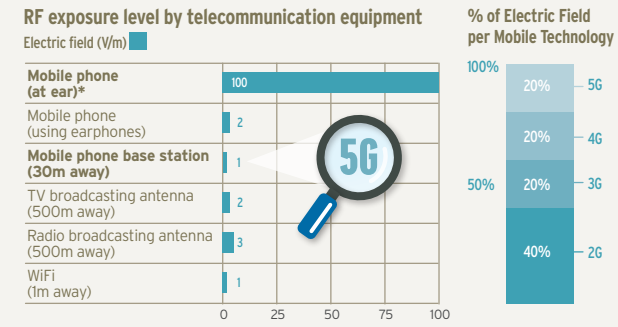
- 3.6 GHz** – This is the first frequency band being used in Ireland and most countries. It is similar to the frequencies currently used for 4G.
- 700 MHz** – This frequency was previously used for analogue TV.
- 26 GHz** – This band will be used in the future in Ireland and worldwide.



One feature of 5G is the so called 'beamforming', which allows sending 5G signals only where and when they are needed, reducing power needs and potentially exposure.

## WILL 5G INCREASE EMF EXPOSURE?

5G signals represent a small fraction of the emissions from all mobile technologies. Since 5G equipment is being added to existing networks, it is possible that there may be a small increase in the overall RF EMF exposure level. However, the total exposure is expected to remain low, comparable with pre-5G levels and well below the ICNIRP guidelines. The EPA will monitor public exposure to RF EMF, including the frequencies used for 5G.



\* Estimate for mobile phone (at ear) based on typical SAR level (1 W/kg), which may be reached in low-coverage situations.

**“No health effects have been proven at EMF exposure levels below international guidelines”**  
The World Health Organization (WHO)