

The Rt. Hon. Wera Hobhouse MP
26 Charles Street
BA1 1HU

9th April 2019

Dear Wera,

We are writing to you as constituents to express our alarm regarding the proposed rollout of 5G in Bath and the surrounding South-West region, and to request that it be put on hold pending a thorough, independent investigation into its effects on human populations and the environment. In particular, we are concerned about the risks to public health, especially that of children, pregnant women and the elderly or those with chronic illness, and the impact on wildlife, plants and trees from this untested technology.

The fact that this technology has never been tested for health effects means the rollout is unethical and indeed breaches the [Nuremberg Code, 1947](#)¹ (this legally-binding code requires informed consent before performing experiments on human populations). The 5G rollout will result in massive increases in microwave radiation exposures for the general public whose consent has not been sought and who have not been directly informed of the risks.

How is 5G different from 4G?

4G uses frequencies in the microwave spectrum up to 6 gigahertz. 5G wireless technology will continue to use these frequencies whilst adding much higher frequencies in the microwave spectrum (up to 100 gigahertz and beyond). Due to these higher frequencies, 5G cannot penetrate materials as easily or travel as far. Therefore, to ensure adequate coverage, the 5G rollout requires that numerous small cells with wireless antennas be installed at regular intervals on residential buildings in urban areas, as well as on existing street furniture such as LED streetlights, lamp-posts and bus stops.

[5G is part of a wider agenda](#)² - it is not just about mobile phones having faster download speeds. It is also about super-connected 'smart' cities where streets are saturated in wireless signals, enabling driverless cars and the 'Internet of Things', linking objects in our homes to smartphones and devices, allegedly bringing greater convenience to our busy lives as well as providing personal data for marketing and surveillance purposes. But are these potential 'benefits' really justified, given the risks posed to public health and the environment?

What are the risks to public health and the environment?

As of 1st January 2019, 247 independent scientists from 42 nations had [signed an appeal](#)³ to the United Nations, UNEP (United Nations Environment Programme), UN Member States and the World Health Organisation, urging a moratorium on the rollout of 5G (attached in the hard copy version of this letter). This was followed, by the [International Appeal to Stop 5G in space and on earth](#)⁴ in response to proposals for 5G satellites in space which would blanket the entire planet. As of 29 March, 2019, the appeal had 63,379 signatories from at least 168 countries from scientists, doctors, biologists, engineers and ordinary citizens.

5G emits non-ionizing radiation in the microwave range which is [associated with a range of health problems](#)² (further details below). It also makes use of millimetre wave technology (used in crowd control weapons) which has been shown to cause permanent damage to the eyes, as well as damage to the skin and nervous system.

[5G Wireless Expansion: Public Health and Environmental Implications](#)⁵ a 5G research review, documents the range of reported adverse effects of RF and millimeter waves. These effects range from cancer, to changes in bacteria growth and even to DNA damage. The study concludes that “a moratorium on the deployment of 5G is warranted” and “the addition of this added high frequency 5G radiation to an already complex mix of lower frequencies, will contribute to a negative public health outcome ... from both physical and mental health perspectives” (Russell 2018).

Professor Martin Pall (Professor Emeritus of Biochemistry and Basic Medical Sciences at Washington State University) provided extensive evidence to the EU regarding [eight distinctive types of harm](#)⁶ caused by non-ionizing radiation, including 5G. These are:

1. Damage to DNA
2. Increase in male and female infertility and miscarriage
3. Neurological/neuropsychiatric effects (e.g. sleep disturbance/insomnia; fatigue; headache; depression; lack of concentration/cognitive dysfunction/memory changes; dizziness; restlessness/anxiety/irritability)
4. Cell death, leading to neurodegenerative disease, including Alzheimer's
5. Oxidative stress/free radical damage, a key factor in the development of cancer
6. Widespread endocrine and hormonal effects including reduction in insulin, a key factor in diabetes
7. Increase in intracellular calcium
8. Direct cancer causation

The US Environmental Health Trust has compiled a list of the [key published research showing adverse effects of radiofrequency exposure](#)⁷ from the 5G rollout.

Other studies into the impact of wireless radiation on the environment show a [significant threat to wildlife](#)⁸ including bees and other insects, birds and mammals, as well as plants and trees. Microwave radiation was shown to disrupt migration and navigation systems in a number of species, and trials of 5G triggered adverse effects, including extreme agitation in cattle.

The [Eclipse Report](#)⁹ an EU-funded review body dedicated to policy that may impact biodiversity and the ecosystem, reviewed 97 studies on how electromagnetic radiation may affect the environment. It concluded that this radiation could indeed pose a potential risk to bird and insect orientation and plant health.

Matt Shardlow, CEO of Buglife, the insect conservation charity, [recently commented that](#)¹⁰:
“There is a credible risk that 5G could impact significantly on wildlife therefore, we call for all 5G pilots to include detailed studies of their influence and impacts on wildlife and for the result of those studies to be made public.”

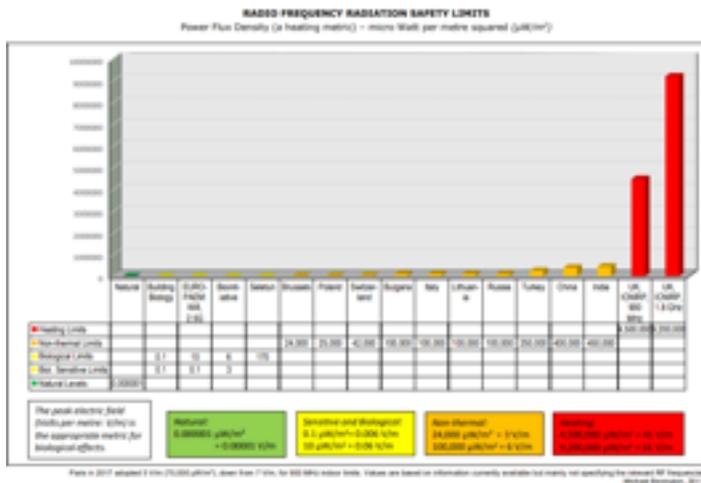
The government position on 5G lags behind the latest science

A [December 2018 review in The Lancet](#)¹¹ of the existing 2,000+ peer-reviewed studies on the impact of wireless technology on human and animal systems revealed that 68.2% find significant biological effects. The Lancet review concludes: “*This weight of scientific evidence refutes the prominent claim that the deployment of wireless technologies poses no health risks at the currently permitted non-thermal radio-frequency exposure levels*”.

A current [petition to Parliament to halt the 5G rollout](#)¹² elicited this Government response:

“*Exposure to radio waves has been carefully researched and reviewed. The overall weight of evidence does not suggest devices producing exposures within current guidelines pose a risk to public health*”.

However, **the Government’s response is based upon outdated research from Public Health England (all but one study cited is pre-2013) that only looks at thermal effects i.e. heating of the body.** As the above studies show, non-thermal effects from non-ionizing radiation are significant. Based on PHE’s guidelines, the UK currently has one of the highest safety limits for radiofrequency radiation in the world: other countries, including China and Russia, have much lower limits.



Opposition to 5G from other countries

In the USA, Senator Richard Blumenthal (Connecticut) recently [challenged the rollout of 5G](#)¹³ on public health grounds, and public pressure in the town of Mill Valley, California last autumn [blocked the installation of 5G](#)¹⁴ also on health grounds.

In Europe, governments have halted the installation of 5G antennas over concerns about their health effects. Brussels Environment Minister Celine Fremault [stated](#):¹⁵ “*I cannot welcome such technology if the radiation standards, which must protect the citizen, are not respected, 5G or not. The people of Brussels are not guinea pigs whose health I can sell at a profit. We cannot leave anything to doubt.*” Belgium has much lower safety limits for radiofrequency radiation than the UK (see graphic attached).

In Rome, a resolution opposing 5G by the XII Municipality asks “*the mayor to stop the 5G trial and not to raise the limit values in the threshold of electromagnetic radiation avoiding the*

positioning of groups of mini-millimeter microwave antennas on homes, schools, day centers, recreation centers, street lamps and more.” This resolution, which was in direct opposition to the Rome Mayor’s support for 5G trials, passed with 11 votes in favour and three abstentions. Rome Councillor, Massimiliano Quaresima, [stated](#)¹⁶, “The fight against electromagnetic pollution is our strong point. I am in favor of technological progress but not on the experimentation of 5G technology in the absence of certain scientific data on the repercussions for health. Apply the precautionary principle sanctioned by the European Union.”

5G rollout in Bath and Bristol

West of England Mayor, Tim Bowles and leader of Bath & North East Somerset Council, Tim Warren (both Conservative) have spoken about the [tourism potential of 5G](#)¹⁷ after trials of the technology took place at the Roman Baths in December 2018. 5G technology allows for virtual or augmented-reality images (for example, a Roman soldier) on smartphones, creating a so-called ‘immersive experience’ for users.

Meanwhile, up the road at Bristol University, 5G has been extensively used since 2015 on campus by the Smart Internet Lab, largely as part of research into driverless cars. There are growing concerns that it might be a contributory factor in the [recent spate of suicides of students](#)¹⁸ and other young people in the city, since this technology impacts the nervous system and can cause [neuro-psychiatric symptoms](#)¹⁹ such as depression and anxiety. Given the above, we are concerned at the news that [Bath University has plans to follow Bristol](#)²⁰ as a hub of 5G research and innovation.

The focus of much of the above research is into digital entertainment and driverless cars. Is this technical gimmickry enough to justify the risks to public health both physical and mental, as well as damage to the environment?

Changes to planning laws – implications for residents and the built environment

In February 2019, [national planning laws were changed to accommodate 5G demands](#)²¹ (pp. 33-34). These effectively prevent local councils from refusing installation of 5G infrastructure and the amendments make it very difficult for householders to prevent 5G-enabled antennas from being installed in the street where they live, or even on the walls of their homes. With regard to the built environment, this would mean peppering Georgian Bath with medium-sized transmitters. Bath stone may also be more difficult to penetrate, requiring dense clustering of transmitters in the historic city centre. As well as damaging aesthetics, this will lead to a massive increase in microwave radiation exposure for the general public and visitors to the city.

Why 5G and smart technology are not ‘green’ and never will be

We wholeheartedly support Bath and North East Somerset Council’s recent resolution to make the local authority carbon neutral by 2030. However, the idea that ‘smart’ technology is a way to achieve this is misguided. The following are examples of how 5G infrastructure is not only **not** green but actively destructive of the environment.

1. **Tree felling:** trees apparently interfere with 5G signal and are seen as a major obstacle to the smooth operation of the network. This has been evidenced in [research by the University of Surrey](#)²² which refers to mast height at tree level as a limiting factor for

reach and reliability (p4 article 3.1)._ Yet, trees are an important carbon sink, and climate change mitigation requires the planting of more trees, not the felling of mature ones! Trees also mitigate the effect of air pollution, another priority for Bath & North East Somerset Council, and provide important habitats for wildlife.

2. **The 'Things' required for the Internet of Things:** this requires the disposal of old gadgets and appliances, creating waste which has a major environmental impact, and the purchase of new 'smart' replacements which require raw materials to be extracted and made into consumer items before being transported around the world (all of which uses vast amounts of fossil fuels).
3. **Energy required to power the Internet of Things:** this year for the first time, data centres for the Internet (including those for Google and Facebook) and the servers that power them, are set to [produce more carbon emissions than aviation](#)²³. Bath and North East Somerset council has rightly stated its opposition to the expansion of Bristol Airport, yet supports the even more carbon-intensive expansion of wireless technology!
4. **Deployment of millions of new transmitters:** these range from 25 m high towers for rural coverage; to medium-sized small cells on lamp posts, on buildings and under manhole covers; to tiny micro-transmitters embedded in domestic objects. These transmitters contain metals including gold, copper, silver and lithium all of which have to be mined (mining is the second most polluting industry in the world), often in conflict zones such as the Democratic Republic of Congo (DRC).
5. **Disruption to migration and orientation of birds, insects and marine mammals (please see above under What are the risks to public health and the environment?).** [Alfonso Balmori, writing in Science of the Total Environment](#)²⁴ concludes that *"At the present time, there are reasonable grounds for believing that microwave radiation constitutes an environmental and health hazard.... Controls must be introduced and technology rendered safe to the environment, since this new ubiquitous and invisible pollutant could deplete the efforts devoted to species conservation."*
6. **Potential harm to the world's climate systems from microwave radiation:** Last December, [an article in The Lancet](#)²⁵ stated that: *"The potential effects of these anthropogenic electromagnetic fields on natural electromagnetic fields, such as the Schumann Resonance that controls the weather and climate, have not been properly studied"*.

In view of the above, we urge you in your capacity as Liberal Democrat spokesperson for housing, communities and local government, to advocate for an immediate halt to the roll-out of 5G infrastructure in Bath and North East Somerset and the South-West region, pending a full, transparent and comprehensive independent review of its safety with regard to public health, environmental and wildlife protection.

We look forward to your response.

Yours sincerely,

[Bath constituents. Personal details removed]

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