

JOINT STATEMENT TO
Industry, Science and Economic Development Canada (ISED)

September 6, 2022

Canada Gazette, Part I, Volume 156, Number 25, June 18, 2022, Notice No. SPB-001-22:
Consultation on a Policy and Licensing Framework for Spectrum in the 26, 28 and 38 GHz Bands

Most Canadians are presently exposed to “wireless” radiation (radiofrequency electromagnetic radiation, RF-EMR) levels a quintillion times higher than the natural background.¹ Experts warn that this poses a serious risk to our health and to the environment. If released for use, millimetre waves would be emitted by antennas on cell towers, and hundreds of thousands of small cells being installed across Canada; many in very close proximity to people and wildlife. In addition, millions of 5G wireless devices such as cell phones would further contribute to exposures.

WE, CANADIAN EXPERTS AND CITIZENS' GROUPS,
urgently call for a MORATORIUM on the release of
the extremely high frequency millimetre wave spectrum (mmWaves)

including the 26/28 GHz bands

UNTIL

Industry, Science and Economic Development Canada (ISED), Health Canada,
and Environment and Climate Change Canada (ECCC) complete the following:

1. **Comprehensive studies, with hazard and risk analyses of known and potential adverse health effects (human and environmental),** including non-thermal biological effects, of exposures to radiofrequency electromagnetic radiation (RF-EMR), including millimetre waves.²
2. **Health Canada develops demonstrably safe exposure limits for RF-EMR, to incorporate the non-thermal effects,** basing limits on a health-protective precautionary interpretation of the findings (i.e., a reasonable certainty of "no harm", especially for pregnant women, children, the elderly, people who are ill, and people who are electrosensitive).
3. **ECCC establishes legally binding exposure limits to protect the environment, including wildlife – all flora and fauna – against harm from RF-EMR.**
4. **ISED establishes procedures that are fully transparent and effective to:**
 - **monitor and report RF-EMR emissions,** as measured from existing equipment and modelled for proposals;
 - **map environmental exposure levels** (existing and proposed) for all areas across Canada;
 - **ensure industry compliance** with more stringent regulatory requirements for infrastructure and devices;
 - **ensure that no frequency bands are released that could place lives at risk by interfering with critical Earth observation data** (e.g., that would reduce weather forecasting accuracy);
5. **ISED establishes a meaningful, comprehensive and transparent process for municipalities and citizens to have a decisive say over whether and where cellular network antennas are installed,** on both towers and non-tower structures (e.g., lamp posts, hydro poles and buildings).³

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¹ Planetary Electromagnetic Pollution: It Is Time to Assess Its Impact. *The Lancet*. (2018): 512–14.
[https://www.thelancet.com/journals/lanph/article/PIIS2542-5196\(18\)30221-3/fulltext](https://www.thelancet.com/journals/lanph/article/PIIS2542-5196(18)30221-3/fulltext).

² This study, by a truly independent panel with appropriate expertise, requires rigorous scientific methods, transparency, full public consultation from initial scoping throughout the process, and health-protective precautionary interpretation of findings.

³ Informed public participatory consultation and local decision-making, giving full consideration of environmental, health and security issues, and of hazards, risks and costs of wireless expansion compared to alternatives (e.g., use of fibre/cable), must replace the broad powers currently vested in the Minister of ISED.

SIX REASONS FOR A MORATORIUM

ON THE RELEASE OF THE MILLIMETRE WAVE SPECTRUM (mmWAVES):

Reason #1: There has been no research on the long-term health effects of mmWaves.

There has been no research on the health effects of long-term exposure to ensure that mmWaves and the new 5G technologies are safe. To quote a U.S. Senator: “So there really is no research ongoing. We’re kind of flying blind here, as far as health and safety is concerned.”⁴

Health Canada itself has admitted that it could not find any human studies that assessed potential health impacts (e.g., cancer, or effects on the eyes, child development, reproduction, cognition, the immune system) of exposure to RF-EMR in the 6–300 GHz frequency range that will be used for 5G technology, including the mmWave frequencies.⁵

Reason #2: There is strong scientific evidence that radiation from current (pre-5G) wireless technologies causes serious adverse effects (5G will worsen the existing problem).

- Hundreds of high-quality peer-reviewed studies show that exposure to radiofrequency electromagnetic radiation (RF-EMR) from present-day wireless technologies causes serious adverse health effects (e.g., DNA damage, cancer, sperm damage, neurological effects, and more).⁶
- 5G will use those same frequencies, plus it will employ new technologies and add the higher-frequency millimetre wave (mmWave) bands.
- Children and other susceptible/vulnerable populations are more seriously impacted.
- Scientists specialized in the field have been warning governments that this type of radiation is harmful. More than 40 appeals calling for standards that are more protective from RF-EMR have been endorsed by hundreds of researchers and physicians.

Some people experience more immediate, and sometimes debilitating, health effects:

Electrohypersensitivity (EHS)

- As with other environmental exposures, some people are more immediately susceptible and overtly affected by wireless radiation. Common symptoms include, among many others: headaches, cognitive difficulties, cardiovascular difficulties and sleep problems.
- Surveys conducted estimate that 3% to 13% or more of the population experience symptoms of EHS.⁷
- Many are being misdiagnosed or undiagnosed because the medical community is not well-informed about the symptoms and underlying causes.

Wildlife, including birds and pollinators, and plants are also detrimentally affected.

- Research has demonstrated adverse effects of radiofrequency radiation on wildlife, such as birds, amphibians, insects, fish, mammals and plants. Studies show that RF-EMR can impact the navigation abilities of birds and bees; and cause nest and site abandonment, plumage deterioration, locomotion problems, reduced survivorship, and death in wild nesting birds.^{8,9}

⁴ US Senator Richard Blumenthal, US Senate Hearing on the Future of 5G Wireless Technology, Feb 6, 2019.

<https://www.youtube.com/watch?v=ekNC0J3xx1w&feature=youtu.be>

⁵ Health Canada, Analysis of recommended localized human exposure limits for radiofrequency fields in the frequency range, 6 GHz to 300 GHz. p. 32. https://c4st.org/wp-content/uploads/docs/GovRelations/Fed/Health-Canada/Health_Canada_Analysis_of_Recommendations_above_6GHz.pdf

⁶ Hundreds of recent scientific reports show harms from “wireless” radiofrequency radiation. <https://preventcancer.org/ca/hundreds-of-recent-scientific-reports-show-harms-from-radiofrequency-radiation/>

⁷ Clegg, F. M., Sears, M., Friesen, M., Scarato, T., Metzinger, R., Russell, C., Stadtner, A., & Miller, A. B. (June 2020). Building science and radiofrequency radiation: What makes smart and healthy buildings, *Building and Environment*, 176(106324), <https://doi.org/10.1016/j.buildenv.2019.106324>

⁸ Manville, Albert. A Briefing Memorandum: What We Know, Can Infer, and Don't Yet Know about Impacts from Thermal and Non-thermal Non-ionizing Radiation to Birds and Other Wildlife. Submitted to the FCC in 2016. (Albert M. Manville, II, Ph.D., C.W.B.; Principal, Wildlife and Habitat Conservation Solutions, LLC; Adjunct Professor, Johns Hopkins University's Krieger School of Arts and Sciences, DC Campus; and former U.S. Fish and Wildlife Service agency lead on avian-structural impacts — including from radiation)

Reason #3: Health Canada's exposure guidelines¹⁰ (Safety Code 6) do not protect Canadians.

These guidelines are:

- **based on a 6-minute exposure** for far-field exposures (i.e., more than 8 inches from the body) such as from cell tower antenna emissions;
- **based on a disproven assumption** that tissue must be heated to be harmed (only “thermal” effects are covered). Health Canada dismisses all studies that do not conform with this assumption. Also, Health Canada recently admitted that *“there is only limited experimental human data related to human tissue heating by RF energy for frequencies above 6 GHz.”*¹¹
The mmWaves ISED plans to release are in the 26, 28 and 38 GHz bands.
- **not based on the most current scientific evidence** demonstrating harm, such as DNA damage at levels far below Safety Code 6 maximum limits.

Furthermore,

- **Health Canada relies on biased organizations when setting its guidelines** – in particular the International Commission on Non-Ionizing Radiation Protection, a self-appointed group that has come under criticism for conflicts of interest.^{12, 13, 14, 15, 16}
- **Health Canada does not consult Canadians.**
For example: Until recently, all devices used close to the body at frequencies below 6 GHz had to respect the *SAR limit*, while those used further from the body had to respect *power density limits*, 2 to 10 W/m². Since the new 5G devices that are to be used close to the body would use frequencies above 6 GHz including mmWaves (in addition to presently used frequencies), Health Canada chose to **double the power density limit** to 20 W/m² for these devices, without consulting Canadians and without long-term experimental data.^{17, 18}

⁹ Protect Birds, Bees and Trees: Include Anthropogenic Radiofrequency Electromagnetic Radiation in *Canadian Environmental Protection Act* Amendments. White Paper. (April 2022) by Prevent Cancer Now and Canadians for Safe Technology: <https://preventcancer.ca/wp-content/uploads/2022/04/RF-EMRinCEPA-WhitePaper-inclAmendments-PCNC4ST-UPDATED2022April7.pdf>

¹⁰ Safety Code 6 – *Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz*. <https://www.canada.ca/en/health-canada/services/publications/health-risks-safety/limits-human-exposure-radiofrequency-electromagnetic-energy-range-3-300.html>

¹¹ Health Canada, Analysis of recommended localized human exposure limits for radiofrequency fields in the frequency range, 6 GHz to 300 GHz. https://c4st.org/wp-content/uploads/docs/GovRelations/Fed/Health-Canada/Health_Canada_Analysis_of_Recommendations_above_6GHz.pdf

¹² The International Commission on Non-Ionizing Radiation Protection: Conflicts of interest, corporate interests and the push for 5G. Report commissioned, coordinated and published by Members of the European Parliament – Michèle Rivasi (Europe Écologie) and Klaus Buchner (Ökologisch-Demokratische Partei), and financed by the Greens/EfA group in the European Parliament. Brussels, June 2020. https://www.michele-rivasi.eu/wp-content/uploads/2020/06/ICNIRP-report-FINAL-JUNE-2020_EN.pdf

¹³ Hardell, Lennart. “World Health Organization, radiofrequency radiation and health - a hard nut to crack (Review).” *International Journal of Oncology*, vol. 51, 2 (2017): 405-413. doi:10.3892/ijo.2017.4046 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5504984/>

¹⁴ Pascual, Gabriel Doménech. “Not Entirely Reliable: Private Scientific Organizations and Risk Regulation – The Case of Electromagnetic Fields.” *European Journal of Risk Regulation* (Cambridge University Press), Volume 4, Issue 1 (2013): 29-42. <https://www.uv.es/gadopas/2013.Not.Entirely.Reliable.pdf>

¹⁵ “There is something utterly wrong with the ICNIRP membership”, *Between a Rock and a Hard Place*, Science Blog on Mobile Phone Radiation and Health by Dariusz Leszczynski. September 8, 2020. <https://betweenrockandhardplace.wordpress.com/2020/09/08/leszczynski-there-is-something-utterly-wrong-with-the-icnirp-membership/>

¹⁶ “The Lies Must Stop: Disband ICNIRP -- Facts Matter, Now More Than Ever”, *Microwave News*, April 9, 2020. <https://microwavenews.com/news-center/time-clean-house>

¹⁷ January 2021. Notice: Localized human exposure limits for radiofrequency fields in the range of 6 GHz to 300 GHz <https://www.canada.ca/en/health-canada/services/health-risks-safety/radiation/types-sources/radiofrequency-fields/notice-localized-human-exposure-limits-range-6-ghz-300-ghz.html>

¹⁸ Health Canada, Analysis of recommended localized human exposure limits for radiofrequency fields in the frequency range, 6 GHz to 300 GHz. https://c4st.org/wp-content/uploads/docs/GovRelations/Fed/Health-Canada/Health_Canada_Analysis_of_Recommendations_above_6GHz.pdf

Reason #4: ISED is neither monitoring exposures nor enforcing industry compliance with emissions standards.

- ISED states that it is the responsibility of the companies to ensure that they comply, including considering "combined effects of nearby installations." ISED claims it "routinely audits the tower sites."
- However, ISED relies on [Spectrum Licences Site Data](#)¹⁹ that is built on data that licensees upload themselves. This data is error-ridden.²⁰
- Data collection and analyses are not standardized, and lack transparency and accountability. For example, it is unknown how ISED monitors for or assesses "combined effects."
- Nine out of 10 cell phones on the market in Canada exceed Safety Code 6 guidelines in real use, and yet ISED is taking no action. These devices remain on the market, and in use.²¹
- The *Radiation Emitting Devices Act* does not mention radiofrequency radiation, nor telecommunications devices, in the law nor regulation.²²

Reason #5: Introducing mmWave bands to facilitate the deployment of 5G wireless networks and technologies will also:

- **increase risks to individual and business privacy, and cybersecurity.**^{23, 24}
 - Wireless networks are less secure and more vulnerable to hacking, than wired systems.
 - 5G networks will allow massive amounts of data to be transmitted wirelessly, providing more opportunities to intercept, collect, process, and use personal, financial, strategic or other data, for illegitimate or nefarious purposes.
- **interfere with critical satellite data, resulting in an estimated 30% reduction in weather forecast accuracy, and decreased capability to monitor the climate,** according to NASA and the US National Oceanic and Atmospheric Administration.^{25, 26} It is reported to be degrading weather forecasts already in Europe.²⁷

"Critically, virtually every sector of the Nation's economy is weather-sensitive and any degradation of Earth observation data for scientific and operational uses can be expected to have significant negative financial and safety impacts.

If forecasts of hurricanes, floods, and other natural disasters were degraded, lives and property would be at risk. The profitability of (...) industries, ranging from agriculture and energy to manufacturing and transportation, would also be adversely affected if forecasts become less accurate." – W.P. Mahoney, Associate Director, National Center for Atmospheric Research²⁸

¹⁹ http://sms-sgs.ic.gc.ca/eic/site/sms-sgs-prod.nsf/eng/h_00010.html

²⁰ A C4ST volunteer, tracking the data since 2016, has discovered hundreds of thousands of duplicate records and other anomalies. When errors are pointed out, they are eventually corrected. However, the Spectrum Management Operations Branch Officer explained in an email that: "The Spectrum Licences Site Data is built upon the data that spectrum licensees upload. ISED regulates them, but the companies are responsible for updating the data."

²¹ <https://tinyurl.com/2dc5vwa6>

²² Radiation Emitting Devices Act (R.S.C., 1985, c. R-1): <https://laws-lois.justice.gc.ca/eng/acts/R-1/> ; Radiation Emitting Devices Regulations: https://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1370/index.html

²³ Schneier, B. (2019, September 25). Essays: Every Part of the Supply Chain Can Be Attacked - Schneier on Security. *The New York Times*, Sept 25, 2019 https://www.schneier.com/essays/archives/2019/09/every_part_of_the_su.html

²⁴ The Electronic Frontier Foundation (<https://www.eff.org/>) offers some in-depth analysis of privacy and security issues. EFF is an independent non-profit that has been working to protect online privacy for nearly thirty years

²⁵ <https://www.washingtonpost.com/weather/2019/05/23/head-noaa-says-g-deployment-could-set-weather-forecasts-back-years-wireless-industry-denies-it/>

²⁶ Spectrum Needs for Observations in Earth and Space Sciences. US House of Representatives Committee on Science, Space, & Technology, Hearing, July 20, 2021. <https://science.house.gov/hearings/spectrum-needs-for-observations-in-earth-and-space-sciences>

²⁷ Radio Frequency Interference: an NWP perspective on the RFI 2022 workshop. March 14, 2022.

<https://www.ecmwf.int/en/about/media-centre/science-blog/2022/radio-frequency-interference-nwp-perspective-rfi-2022>

²⁸ Congressional testimony of William Paul Mahoney III, Associate Director, National Center for Atmospheric Research. 2021. <https://science.house.gov/imo/media/doc/Mahoney%20Testimony.pdf>

- **contribute significantly to climate change and pollution.**
 - Wireless technologies consume at least 10 times more power than wired technologies.²⁹ A 5G base station is expected to consume roughly three times more power than a 4G base station. Furthermore, 5G will require far more base stations.³⁰
 - 5G will cause a substantial increase of e-waste since devices currently used will become obsolete. E-waste contains toxic and difficult-to-recycle components; only 20% of e-waste is recycled today,³¹ and that is often subpar.
 - The exponential growth of wireless technologies is associated with large increases in greenhouse gases, both from the “life cycle” of devices and their use. *Greenhouse gas emissions associated with smart phones alone jumped 730% in absolute terms in just 10 years.*³²
- **increase the economic burden as a consequence of** higher health care costs;³³ lost productivity; security and privacy breaches;^{34, 35} agricultural harm; damage caused by the degradation of weather forecast accuracy; and environmental damage.³⁶ All of the described risks, which have never been evaluated nor considered, will translate into tangible costs to Canadian society.³⁷

Reason #6: Releasing the mmWave spectrum and encouraging the deployment of 5G technologies contravenes principles of *Canada's Digital Charter*.

ISED's Policy Objectives for the current consultation (section 3) include following the 10 principles of *Canada's Digital Charter*.³⁸

- These principles include universal access, a level playing field for business, safety and security, and protection of privacy. **All of these principles would be better served by ensuring that all Canadians have access to fibre optic connections (FTTP) not connected to wireless.** Fibre-optic connections are safe, 100 times faster and more reliable, much less vulnerable to security and privacy breaches, more dependable/resilient in a disaster, and consume one-tenth of the energy.³⁹
- The goal of *Canada's Digital Charter* is to establish “a **people-centred and inclusive digital economy built on trust.**” ISED's regulations prevent citizens from opposing a cell tower on the basis of health or environmental concerns. They also do not require public notification for small cell antennas nor for low earth orbit satellites. **It is not “people-centred and inclusive” nor does it “build trust” to install antennas close to people's homes and workplaces, without their knowledge or consent.**

²⁹ Baliga, J., Ayre, R., Hinton, K., & Tucker, R. (2011). Energy Consumption in Wired and Wireless Access Networks. *IEEE Communications Magazine*, June 2011, p. 76 <https://ieeexplore.ieee.org/document/5783987>

<https://people.eng.unimelb.edu.au/rtucker/publications/files/energy-wired-wireless.pdf>

³⁰ Koziol, Michael. (2019). 5G's Waveform Is a Battery Vampire. *IEEE Spectrum*, July 24, 2019. <https://spectrum.ieee.org/5gs-waveform-is-a-battery-vampire>

³¹ International Telecommunication Union (2020). <https://www.itu.int/en/mediacentre/backgrounders/Pages/e-waste.aspx>

³² Belkhir, L. & Elmeligi, A. (2018). Assessing ICT global emissions footprint: Trends to 2040 & Recommendations. Elsevier, *Journal of Cleaner Production*, 177, 448-463.

³³ Press Conference - Ontario Doctors Warn of Rising Health Care Costs after 5G Roll Out

https://www.youtube.com/watch?time_continue=4&v=S16QI6-w9I8

³⁴ Schneier, B. (2019, September 25). Essays: Every Part of the Supply Chain Can Be Attacked - Schneier on Security.

https://www.schneier.com/essays/archives/2019/09/every_part_of_the_su.html

³⁵ The Threat Lab. (2019, June 26). The History of Cellular Network Security Doesn't Bode Well for 5G.

<https://www.eff.org/deeplinks/2019/06/history-cellular-network-security-doesnt-bode-well-5g>

³⁶ The Minister of Environment and Climate Change Canada (ECCC), in his response to an Environmental Petition to the Auditor General (October 2021), confirmed that: ECCC “is not examining energy and resources implications to sustainability and climate change from the use of various alternative technologies for telecommunications.” Petition 456. (2021). The Government of Canada's rigour and transparency in evaluating the science regarding localized exposures to 5G technologies in its update of Safety Code 6. https://www.oag-bvg.gc.ca/internet/English/pet_456_e_43873.html; Petition and government responses available at: <https://preventcancer.ca/wp-content/uploads/2022/02/5G-Petition-and-Government-Response.pdf>

³⁷ Patel, N. (2019, May 23). Wait, why the hell is the ‘race to 5G’ even a race? <https://www.theverge.com/2019/5/23/18637213/5g-race-us-leadership-china-fcc-lte>

³⁸ Canada's Digital Charter: Trust in a digital world. https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00108.html

³⁹ Schoechle, Timothy. (2018). Re-Inventing Wires: The Future of Landlines and Networks. *National Institute for Science, Law & Public Policy Washington, DC*, 156. <https://bit.ly/3crWnfV>