

Innovation, Science and Economic Development
Ottawa, ON



September 15, 2017

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To: ic.spectrumbauctions-encheresduspectre.ic@canada.ca

RE: Canada Gazette, Part I, June, 2017, "Consultation on Releasing Millimetre Wave Spectrum to Support 5G", notice reference number (SLPB- 001-17).

Dear Sir or Madame:

This submission is regarding the Canada Gazette, Part I, June, 2017, "Consultation on Releasing Millimetre Wave Spectrum to Support 5G", notice reference number (SLPB- 001-17). Specifically question 7-2.

Canadians for Safe Technology (C4ST) is aware that Industry, Science and Economic Development (ISED) has adopted Health Canada's Safety Code 6 guidelines as its standard for safe exposure of people to wireless radiation of the frequency bands under the proposed licensing. From past experiences, we know that Health Canada has been slow to act on other public health issues e.g. cigarette smoking, thalidomide and asbestos.

We believe it is prudent that ISED should implement a moratorium on the issuance of new licenses under the New Licensing Framework for the 24, 28 and 38 GHz Bands and request this moratorium be expanded to the 37-40 GHz and 64-71 GHz Bands for the following reasons:

1. **Many radiation emitting antennae within meters of homes and schools** - Intensive infrastructure will be required because 5G technology is effective only over short distances, and is poorly transmitted through solids. This requires unobstructed paths between transmitters and receivers. Thus, many antennae are necessary, preferably line-of-sight. As a result, full-scale implementation could result in "small" yet powerful antennae every 3 to 10 houses in residential areas.¹
2. **Concern regarding health effects** - There is strong scientific evidence that the radiation we are now being exposed to from 2G, 3G and 4G has serious adverse effects on human health.² The new spectrum proposed to be licensed has undergone very little research on human health effects. Neither Health Canada nor Innovation, Science and Economic Development Canada can point to any peer-reviewed evidence-based science that shows 5G technology is safe.³ What we do know is of concern.
3. **Cancer concerns** - Radiation from wireless devices, including the 5G frequencies to be licensed, has been designated a Class 2B, *possible* human carcinogen by the World Health Organization.⁴ Lead is in the same category.

¹ <https://ehtrust.org/key-issues/cell-phoneswireless/5g-networks-iot-scientific-overview-human-health-risks/>

² <http://c4st.org/wp-content/uploads/2017/04/original-references-of-over-200-scientific-studies-showing-potential-harm-at-levels-below-safety-code-6.pdf>

³ No analyses or evaluation of biological effects were presented in Safety Code 6 (2015), the Safety Code 6 (2015) Rationale, nor in the authorities that are referred to in these reports.

⁴ WHO/IARC Press Release: http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf

4. **Skin will be most affected** - 5G radiation is chiefly absorbed by the skin, the largest organ of the body.^{5,6,7,8} The importance of an informed, precautionary approach is magnified due to interactions between wireless radiation and chemical toxicants⁹. As one example, some toxicants can concentrate in the skin, and interactions with wireless radiation may be one reason for increasing incidence of skin cancers on non-sun-exposed skin. 5G may magnify and accelerate this issue.
5. **Adverse effects demonstrated in military applications** - We simply do not know the full effects of the 5G pulsed frequencies. As outlined by the Environmental Health Trust, we do know for frequencies just above 5G that "...the U.S., Russian and Chinese [defense agencies](#) have been developing weapons that rely on the capability of this electromagnetic frequency range to induce unpleasant burning sensations on the skin as a form of crowd control. Millimeter waves are utilized by the U.S. Army in crowd dispersal guns called [Active Denial Systems](#)¹⁰. This is exploiting the fact that sweat ducts may act as antennae for sub-millimetre wavelength radiation, that can cause point heating and pain.¹¹
6. That these frequencies (millimetre wavelengths) have biological effects has been shown by trials of short term exposures for therapeutic treatments for neurological conditions.¹² What we don't know is what the health effects will be when people are exposed 24/7 from outside sources e.g. microcells on utility poles, as well as from inside sources from 5G emitting devices e.g. from household appliances.
7. **International appeals for better protection**
 - Over 224 scientists from 41 nations, who have published peer-reviewed papers on the biological or health effects of non-ionizing radiation¹³, made the following statement on May 11, 2015: "*These findings justify our appeal to the United Nations (UN) and, all member States in the world, to encourage the World Health Organization (WHO) to exert strong leadership in fostering the development of more protective EMF guidelines, encouraging precautionary measures, and educating the public about health risks, particularly risk to children and fetal development. By not taking action, the WHO is failing to fulfill its role as the preeminent international public health agency.*"¹⁴
 - On Sept. 13, 2017, in Örebro, Sweden, over 180 scientists and doctors from 35 countries sent a declaration to officials of the European Commission demanding a moratorium on the increase of cell antennas for planned 5G expansion. Concerns over health effects from higher radiation exposure include potential neurological impacts, infertility, and cancer.¹⁵

⁵ <https://ehtrust.org/wp-content/uploads/Yuri-Feldman-and-Paul-Ben-Ishai-Abstract.pdf>

⁶ https://www.researchgate.net/publication/51394628_Human_Skin_as_Arrays_of_Helical_Antennas_in_the_Millimeter_and_Submillimeter_Wave_Range

⁷ <http://aph.huji.ac.il/people/feldman/research.htm#Human%20Skin%20as%20Arrays%20of%20Helical%20Antennas%20in%20the%20Millimeter%20and%20Submillimeter%20Wave%20Range>

⁸ <https://www.ncbi.nlm.nih.gov/pubmed/21297244>

⁹ Kostoff, R. N., & Lau, C. G. Y. (2013). Combined biological and health effects of electromagnetic fields and other agents in the published literature. *Technological Forecasting & Social Change*, 80(7), 1331–1349 .

https://www.researchgate.net/publication/273830948_Combined_biological_and_health_effects_of_electromagnetic_fields_and_other_agents_in_the_published_literature

¹⁰ 5G FREQUENCIES ARE USED IN WEAPONS

<https://ehtrust.org/key-issues/cell-phoneswireless/5g-networks-iot-scientific-overview-human-health-risks/>

¹¹ https://www.researchgate.net/publication/51394628_Human_Skin_as_Arrays_of_Helical_Antennas_in_the_Millimeter_and_Submillimeter_Wave_Range

¹² <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1475937/>

¹³ part of the EMF [electromagnetic field] spectrum that includes extremely low frequency fields (ELF) used for electricity, or radiofrequency radiation (RFR) used for wireless communications

¹⁴ As of March 22nd, 2017 the appeal had 225 signatures from 41 nations.

¹⁵ <https://drive.google.com/file/d/0B14R6QNkmaXuelFrNWRQcThNV0U/view>

8. **While Innovation, Science and Economic Development is trying to sort our licensing issues, Canadian companies are implementing 5G pilots:**
- July, 2016 - Bell and Nokia successfully conduct the first Canadian trial of 5G mobile technology <http://mobilesyrup.com/2016/07/29/bell-and-nokia-successfully-conduct-the-first-canadian-trial-of-5g-mobile-technology/>
 - June, 2017 - TELUS and Huawei Complete Successful 5G Wireless Pilot <http://www.iphoneincanada.ca/carriers/telus/telus-5g-wireless-pilot/>
9. The impact to local cities, towns and municipalities is not understood. In June, 2014, Industry Canada modified the "Antenna Tower Siting Procedures" with its document "DGSO-002-14 — Decision on Amendments to Industry Canada's Antenna Tower Siting Procedures"¹⁶, after public input and consultation. There is an opportunity again, to solicit and consider public input on antennae that will be more pervasive, and potentially invasive, of local communities.
10. **We should learn from past public health disasters.** In Canada, our track record of protecting Canadians in a timely manner is not exemplary, when you consider the ongoing delays regarding asbestos, cigarette smoking and bisphenol-A (BPA), as well as thalidomide and urea formaldehyde insulation in the past. The growing scientific evidence indicates that exposure from wireless device emissions are becoming a public health catastrophe of comparable magnitude.
11. **More uncertainty** - Dr. Cindy Russell's article "A 5G Wireless Future: Will It Give Us a Smart Nation or Contribute to An Unhealthy One?" asks highly relevant questions challenging the North American industries' plans to roll out 5G technology.¹⁷
12. **An appeal on behalf of future victims** – Dr. Beatrice Alexandra Golomb, MD, PhD, Professor of Medicine, University of California San Diego School of Medicine writes a very compelling argument on why individuals who will be adversely impacted by the 5G rollout need to be protected. Her argument is supported with references to 360 published articles and papers.¹⁸

We ask ISED to take the prudent route regarding the public health of Canadians and place a moratorium on all 5G technology to which the public will be exposed until the science is fully examined with a systematic review of the literature according to international standards and with a full weight of evidence analysis, based on this review, presented to, and commented on, by the Canadian public who will bear the long term consequences of this 5G technology.

If you have specific peer-reviewed, published, scientific studies, provided by Health Canada, or from other sources showing safety, would you please provide them in a reference format to C4ST.

Sincerely,



Frank Clegg
CEO,
Canadians for Safe Technology (C4ST)
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cc: Mr. John Oliver, MP Oakville, Ontario

¹⁶ <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10840.html>

¹⁷ <http://www.sccma-mcms.org/Portals/19/assets/docs/17ZZ-PDF.pdf?ver=2017-05-10-133815-897>

¹⁸ <https://drive.google.com/file/d/OB14R6QNkmaXubmZUbWl1aERpX1E/view>