Wi-Fi, SMART meters, wireless gadgets – are they safe?

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How do you cope with the invasion of wireless technologies when dealing with officials, suppliers, school boards, and even your neighbours when confronted with trespasses against you, and the lack of choice?

New international government and judiciary interventions are now on your side, and you can use their support to improve your health.

Wireless gadgets & children

40% of 2-to-4 year-old children and 10% of children younger than 2 have used a smart phone, tablet or video *iPod,* according to **Common Sense Media**. There are thousands of "apps" targeting babies and toddlers: interactive games that name body parts or sing nursery rhymes. **Fisher-Price** has just released a near hard case for the *iPhone* and *iPod* touch, framed by a rattle that protects from "dribbles, drool and unwanted call-making". Such historically significant social and behavioural initiatives are manifesting in spite of public counter-indications by government agencies in Canada, the United Kingdom, the **European Council** and other governments worldwide requesting that young people not be exposed to these technologies since 1993.[1] Is it worthwhile to modify the upbringing of the future adults in a way that could end up within 3 to 4 generations that Canada would have an almost totally sterile population, a bigger economic burden of taking care of elderly without young people to save and to pay the taxes for their upkeep, not to mention havoc in trying to sustain "civilization" with enough people as early as 2050 – 2075?

Wi-Fi proliferation – for whose benefit?

Wi-Fi public internet "hotspots" are expected to grow 4-fold within 3 years – to 6,000,000 locations worldwide due to demand for connections on smartphones and tablets while wireless traffic is expected to grow 26-fold according to ***Cisco's Visual Networking Index***. **China Mobile** expects a million *Wi-Fi* locations and Japan's **KDDI** about 100,000 within 6 months. Canada's traffic for *iPhones* in 2015 is slated to be about 750,000 DVDs/hour, but this is nothing compared the data traffic which will grow three times faster, in part due to SMART water, gas and electric meters reporting on what we do and consume at home and elsewhere. With a better economy, Canada's recent sales rates for internet-related-equipment shipments, including PCs, were almost double those of the rest of the world.

The "machine-to-machine" infrastructure technology, also known as "M2M" sustains Smart meters. It is a very demanding set-up because it is "embedding" – a military term applied for journalists following war zone under their supervision and bias - connectivity into devices such as your purchases at retailers, your credit cards, your children's activities at schools (and elsewhere) with business at a whole new level. Indeed, it is reported in Quebec this week, where *Wi-Fi credit card logos* enable thieves take your credit card information just by positioning themselves close to you. Supposedly the information that your banker, your governments and businesses get from this connectivity will "better understand" your preferences and behaviours, according to strategists serving "boardrooms and budget meetings around the world as executives begin to understand the business value" of Wi-Fi connectivity. Promoters are upbeat about the fact that those trespassing your privacy are, "armed with this data, the potential for development of new products and services is limited only by the creativity of the developers. Support improves, problems are quickly solved and customers become more loyal".

Who cares whether we get sick and weaken, become less productive, contribute less creative and social energy to our communities, end up paying less tax. Who cares if the increase in wireless signals in environment corrodes bridges, basements of large buildings, bursts pipelines, water mains, gas mains, pops windows out of buildings, dissolves fire hydrants, sidewalks, sewer tops. Who cares whether these hi-tech signals harden farm soils from absorbing moisture

[1] See Appendix 1 ***Governments and organizations that ban or warn against wireless technology (since 1993)***

and from allowing normal agricultural food production, modify the genetics of small life forms into harmful viral and bacterial epidemics, destroy populations of friendly species of insects and humus life forms – as long as "boardrooms" are happy with the prospects of new, short term business - regardless of the trillions of dollars of losses to Canadian taxpayers due to emergent damages in the coming years.

Stray current corroded these rail spikes in Chicago.

Urban Decay Arriving on Track 11

SALT LAKE CITY IS GETTING A new light-rail line for the 2002 Winter Olympics. And to do it, they must dig up and move every water main, gas pipe, and sewer conduit running parallel underneath the two-and-a-half-mile track.

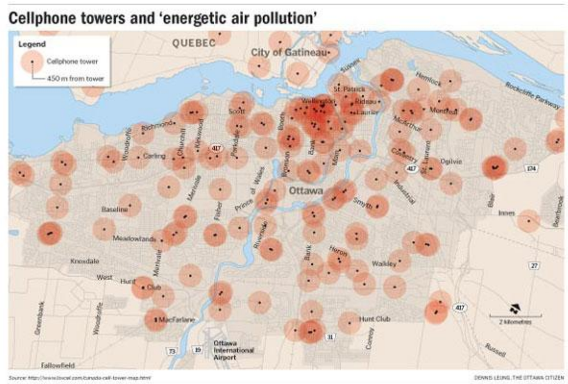
Why? Corrosion. The problem is hardly unique to this rail link, which will connect the main stadium at the University of Utah to downtown. Sometimes stray electrons from the current that powers the train leak into the ground and flow through any pipes or other conductive objects buried there.

"One amp going through for one year will corrode about 20 pounds of steel. It can discharge from a small area and penetrate a pipe in a very short time," says Steve Nikolakakos, a corrosion engineer with Russell Corrosion Consultants of New York.

So Salt Lake City's public utilities project is using nonconductive polymer pipe or plastic-sheathed metal pipe. Plastic or rubber pads under the train tracks prevent current leakage. And routine checks of the pipes will pinpoint trouble spots.

—Fenella Saunders

Corrosion from trains' thyristors' microwaves



Ottawa wireless technology tower transmitters, 2010

Wi-Fi and learning

A Greek study indicates that Wi-Fi exposure may exert gender-related alterations on neural activity associated with the amount of attentional resources engaged during a linguistic test adjusted to induce working memory. [2] Appendix 1 lists school warnings re: Wi-Fi usage, often from medical authorities.

Not so SMART…

The stampede for "creativity" in *Wi-Fi* development has led to interesting revelations. For example, it is generally submitted to regulatory bodies that, for example, "SMART meter use low power (1 watt) wireless radio to send customer energy-usage information wirelessly to utilities for data collection typically lasting from 2 to 20 milliseconds." But when a California administrative law judge **Amy Yip-Kikugawa** ordered all investor owned utilities to answer SMART Meter microwave emission questions.[3] **Pacific Gas & Electricity** informed – for **Landis+Gyr *FOCUS*** and a **General Electric** types of meter used throughout Canada - that:

> The average number of RF pulses for the electric meter would be about 10,000/meter/day with a maximum 190,000. 90% of these pulses are for the mesh [machine-to-machine] network "maintenance", including signals bouncing from [500 to 5,000] homes). Only 6 pulses are for reading the meter data. This doesn't include indoor Home Area Network transmissions to appliances and creatively-embedded devices. [4]
>
> The electric meter transmits at 900 MHz with 1 watt of transmit power. It has an antennae gain 4.0 dB for a peak level power of 2.5 watt [two and a half times more than their stated safety data].[5] The wireless gas meters transmit between 4 and 5 times a day, at 132 - 794 milliWatt.

The emissions to date interfere with metallic medical implants (including FDA-approved RF birth control devices), computer routers, television signals, cordless phones, garage doors, Wi-Fi devices and security systems according to **Maine Public Advocate's office**, to the level that **Central Maine** Power informs the public:

> "Separating interfering devices usually reduces interference, so make sure the wireless device is located as far from the smart meter as possible. Also, adjust the position of the antenna on the device, if possible, and move the wireless device away from any walls that may absorb the signal." *[See: indoor propagation paths / field pattern illustration next page.]*

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2 Papageorgiou CC, Hountala CD, et al. ***Effects of wi-fi signals on the p300 component of event-related potentials during an auditory hayling task***. University of Athens, 1st Department of Psychiatry, Eginition Hospital, Greece. cchountala@teemail.gr. http://www.ncbi.nlm.nih.gov/pubmed/21714138

3 http://emfsafetynetwork.org/wp-content/uploads/2011/11/SDGE_Response_to_ALJ_Ruling_Seeking_Clarification.pdf, http://emfsafetynetwork.org/?p=6030

4 For example, **Hydro Quebec** plans to spend more than $100 million for new software development handling the SMART data innovations over the next decade. Also: http://www.electricityforum.com/news/oct08/LandisGyrinksmeteringcontractwithPGE.html "to empower residential and small business customers in Northern and Central California to make smarter energy choices, better manage their use of electricity, cut their electricity bills, and help protect the environment."

5 January 1, 2011 Santa Barbara CA **Sage Associates** study, ***Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters***. Also: Appendix 2.

SMART transmission range is up to about 3 km. Continuous radiation from up to 5,000 meters in neighbourhoods is worrisome; microwave power from one SMART is comparable to being 60 to 200 m from a major cellphone tower. SMART meters are designed to last only between 5 to 15 years instead of the near-50 years for analog meters, according to the August 26, 2011 **Hydro Québec** submission to the **Régie de l'Énergie** (Energy Board).[6]

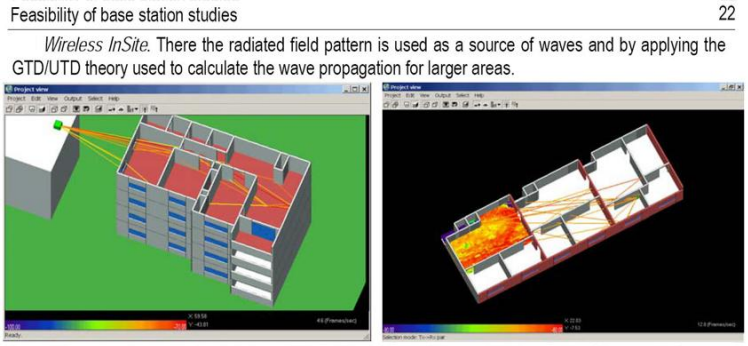


Figure 27: Propagation paths in a building; GSM 900 base station antenna on the opposite roof

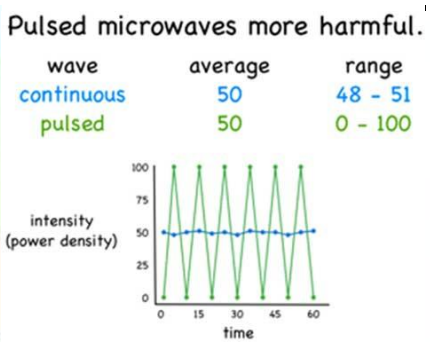
Figure 28: Wireless InSite (Remcom Inc); simulated indoor field distribution

Reflection factor paths for microwave technology emissions

San Bruno California pipeline explosion: caused by SMART meters?

Yet, according to the United States ***FCC Electronic Code of Federal Regulations***: the meters are not supposed to cause interference, and if they do, FCC states, "The operator of a radio frequency device shall be required to cease operating the device upon notification by a Commission representative that the device is causing harmful interference." Anyone experiencing "interference" is to "please" file a complaint with the FCC! The same advice is expected of citizens in Canada: to file a complaint with the federal government.

SMART meter: neighbourhood / household networks



Pulsed (data) microwaves have more power

FDA-approved microwave birth control

Stratford Ontario SMART meter's affects nearby foliage

Burst pipeline, Dailan China – wireless type of corrosion?

Public opposition and concerns

Nevada Energy's 300,000 SMART meter installations indicate numerous problems (some of which result from the deleterious interaction between the installation and indoor wiring errors – exploding computers, for example), surges and aggravation of

[6] http://internet.regie-energie.qc.ca/Depot/Projets/111/Documents/R-3770-2011-A-0005-DDR-DDR-2011_08_26.PDF, and: http://internet.regie-energie.qc.ca/Depot/Projets/111/Documents/R-3770-2011-B-0016-DDR-DDR-2011_09_09.pdf

the quality of life, especially in terms of health. The British Columbia local government decision reflects what may become a common-place responsible government position: that utility delay implementing SMART meter program until public concerns about safety and security are resolved. Some of the frustration is indicated by this case:

> Meredith told me tonight she heard about a little experiment that was conducted where a person had wrapped her Smart Meter with layers of Aluminum foil and the outcome was the power company showing up at the person's door on the same day telling her to remove the foil. If this is indeed true then how exactly does it effect this meter and why the uproar from the big business power company? Is there more to the devices than being made public? Either way it sounds interesting enough that we are going to wrap ours with Aluminum foil in many layers and to make it really secure I will make sure it is all in place with my aluminum duct tape. We will have the camera on standby just in case.

Typical symptoms associated with SMART meter installation

SMART health complaints from occupants of installations correlate with known health effects associated with long-term exposure to low frequency, radio frequency and microwave emissions: heart, respiratory, sleep, hearing & visual and cognitive problems. Other issues aggravate quality of life: audio clicks (troublesome when nursing infants). Aside from increasing public health burden, a global, non-invited trespass of this technology could have grave consequences, involving millions of Canadians in their inability to provide a baseline productive contribution to society and governance.

BIOLOGICAL EFFECTS OF WIRELESS TECHNOLOGIES BELOW CANADA'S REGULATORY LIMIT

Power density ($\mu W/cm^2$)	**Reported Biological Effects**	**References**
0.0000000000001	Altered genetic structure in E. Coli	Belyaev 1996
0.0000000001	Threshold of human sensitivity	Kositsky 2001
0.000000001	Altered EEG in human subjects	Bise 1978
0.0000000027	Growth stimulation in *Vicius fabus*	Brauer 1950
0.00000001	Effects on immune system in mice	Bundyuk 1994
0.00000002	Stimulation of ovulation in chickens	Kondra 1970
0.000005	Effect on cell growth in yeast	Grundler 1992
0.00001	Conditioned "avoidance" reflex in rats	Kositsky 2001
0.000027	Premature aging of pine needles	Selga 1996
0.001	**100 Yards / metres from a Cell Phone**	
0.0027	Growth inhibition in *Vicius fabus*	Brauer 1950
0.0027 to 0.065	Smaller tree growth rings	Balodis 1996
0.007	**50 Feet from a Cordless Phone**	
0.01	Human sensation	Kolbun 1987
0.016	**1 Mile from a Cellular Tower**	
0.06	Altered EEG, disturbed carbohydrate metabolism, enlarged adrenals, altered adrenal hormone levels, changes in liver, spleen, testes, and brain in white rats and rabbits	Dumanskij 1974
0.06	Slowing of the heart, change in EEG in rabbits	Serkyuk, reported in McRee 1980
0.05	**10 Feet / 3 meters from a Wireless Computer**	
0.1	Increase in melatonin in cows	Stark 1997
0.1 to 1.8	Decreased life span, impaired reproduction, structural and developmental abnormalities in duckweed plants	Magone 1996
0.13	Decreased cell growth (human epithelial amnion cells)	Kwee 1997
0.168	Irreversible sterility in mice	Magras 1997
0.2 to 8.0	Childhood leukemia near transmitters	Hocking 1996
0.3	Impaired motor function, reaction time, memory and attention of school children, and altered sex ratio of children (fewer boys)	Kolodynski 1996
0.6	Change in calcium ion efflux from brain tissue	Dutta 1986
0.6	Cardiac arrhythmias and sometimes cardiac arrest (frogs)	Frey 1968
0–4	Altered white blood cell activity in schoolchildren	Chiang 1989
1.0	Headache, dizziness, irritability, fatigue, weakness, insomnia, chest pain, difficulty breathing, indigestion (humans—occupational exposure)	Simonenko 1998
1.0	Stimulation of white cells in guinea pigs	Shandala 1978
2.5	Breakdown of blood-brain barrier (used a digital cell phone to radiate)	Salford 1997
5.0	Leukemia, skin melanoma and bladder cancer near TV and FM transmitter	Dolk 1997
2.0	(lower "Microwave hearing" - clicking, buzzing, chirping, hissing, or high-pitched threshold not tones known)	Frey 1963, 1969,1971,1973,1988 Justeson1979,Olsen1980,Wieske1963,Lin1978
5.0	Biochemical and histological changes in liver, heart, kidney, and brain tissue	Belokrinitskiy l982
10.0	Damaged mitochondria, nucleus of cells in hippocampus of brain	Belokrinitskiy 1982a
10.0	Impaired memory and visual reaction time in people living near transmitters	Chiang 1989
10.0	Decreased size of litter, increased number of stillborns in mice	Il'Chevich (reported in McRee 1980)
10.0	Redistribution of metals in the lungs, brain, heart, liver, kidney, muscles, spleen, bones, skin, blood	Shutenko 1981
1,000.0	United States **FCC Exposure Limit, Safety Code 6 Canada limit**	

Interdisciplinary oversight: merging jurisprudence, regulation with scientific findings

The June 14, 2011 A.M.I.C.A. (l'Associazione malattie da intossicazione cronica e/o ambientale – **Chronic toxic and/or environmental diseases Association**) gathering in Rome involved a most helpful exchange between experts: scientists, lawyers, volunteers, environmentalists and institutional representatives regarding radiofrequency and microwave health risks. One of its main conclusions is that policy-makers face the radiofrequency/microwave issue "seriously and concretely". In the legal exchanges with experts it was demonstrated that the "standards" are inadequate and pose a kind of criminal code crisis, especially with regards to determining causality of damages, and the consequent judgement of guilt. For example: can certain events – including homicide – be connected to electromagnetic emissions. *As has been indicated by medical experts, an "exact" correlation can never be verified. Therefore, the maximum grade of Italian justice does not require absolute certainty, but a known probability, along with the circumstances of a concrete case to demonstrate the event.*

Standard – criteria to apply: 1 to **2** *milli***Gauss criterion**, and **1** *micro***Watt/cm^2 criterion**

With ***Resolution # 1815 (1001),*** the **Council of Europe** recommends to European governments the following SMART meter-relevant statements:

> 8.1.1. take all reasonable measures to reduce exposure to electromagnetic fields, especially to radio frequencies from mobile phones, and particularly the exposure to children and young people who seem to be most at risk from head tumours;
>
> 8.1.2. reconsider the scientific basis for the present electromagnetic fields exposure standards set by the International Commission on Non-Ionising Radiation Protection, which have serious limitations and apply "as low as reasonably achievable" (ALARA) principles, ***covering both thermal effects and the athermal or biological effects of electromagnetic emissions or radiation.***
>
> 8.2.1. set preventive thresholds for levels of long-term exposure to microwaves in all indoor areas, in accordance with the precautionary principle, not exceeding 0.6 volts per metre (1 microWatt/cm^2), and in the medium term to reduce it to 0.2 volts per metre (0.33 microWatt/cm^2).

The credibility of the **A.M.I.C.A**. statements and the **Council of Europe** Resolution can carry considerable weight not only politically but also in Canadian jurisprudence and merit reference to when dealing with officials, suppliers, school boards, and even neighbours when confronted with electromagnetic trespasses against you, and the lack of choice .

Court rulings on non-thermal microwave emissions supporting *BioInitiative* / scientific opinion

The French Court case concerning microwaves at the levels identified by ***BioInitiative***, referred to in our earlier submission, has been confirmed by the **Versailles Appeal Court**. The telephone company **Bouygues Telecom** was ordered on February 4, 2009 by a Versailles appeals court to dismantle cellphone towers in the Lyons area on the basis of the Precautionary Principle and the potential health risk for nearby residents. The ruling is significant because it draws on research such as the *BioInitiative Report* as well as doctors' Appeals of Salzburg (Austria), Freiburg and Bamberg (Germany) and Helsinki (Finland).

www.next-up.org/pdf/A_battle_for_life_Analysis_Versailles_Court_Appeal_Judgement_Locals_Residents_Phone_Masts_Against_Compagny_Bouygues_Telecom_08_02_2009.pdf

Scientific opinion has been accepted in Court rulings involving microwaves: 7 Greek Court rulings, including higher Courts (see **Canada House of Common standing Health committee** (HESA) hearings by **Panagopoulos** on April 29, 2010 for details) and the **Chilean Appeals Court** ruling:

http://www.avaate.org/IMG/pdf/sentencia_corte_apelaciones_Rancagua_Chile_definitoria_56.pdf

Also helpful are in this regard are these links:

www.next-up.org/pdf/Judgement_given_against_Orange_relay_antennas_precautionary_principle_illegal_nuisance_and_health_risk_for_residents_28_09_2009.pdf

www.next-up.org/pdf/PressReleaseN271_07FederalMinistryEnvironmentNatureConservationAndNuclearSafetyGermany12102007.pdf

Non-thermal Effects mechanisms & guidelines

Guidelines for microwave radiation (also used in *Wi-Fi, SMART, wireless technologies*) range 5 orders of magnitude in countries around the world. The lowest guidelines are in Salzburg Austria and in Liechtenstein. (0.1 microW/cm^2). In Switzerland, the guideline is 1 microW/cm^2 and in both Canada and the United States, it is 1,000 *micro*Watt/cm^2 (inducing in healthy bodies about 2^{o}C per/~ 6 minutes of exposure).

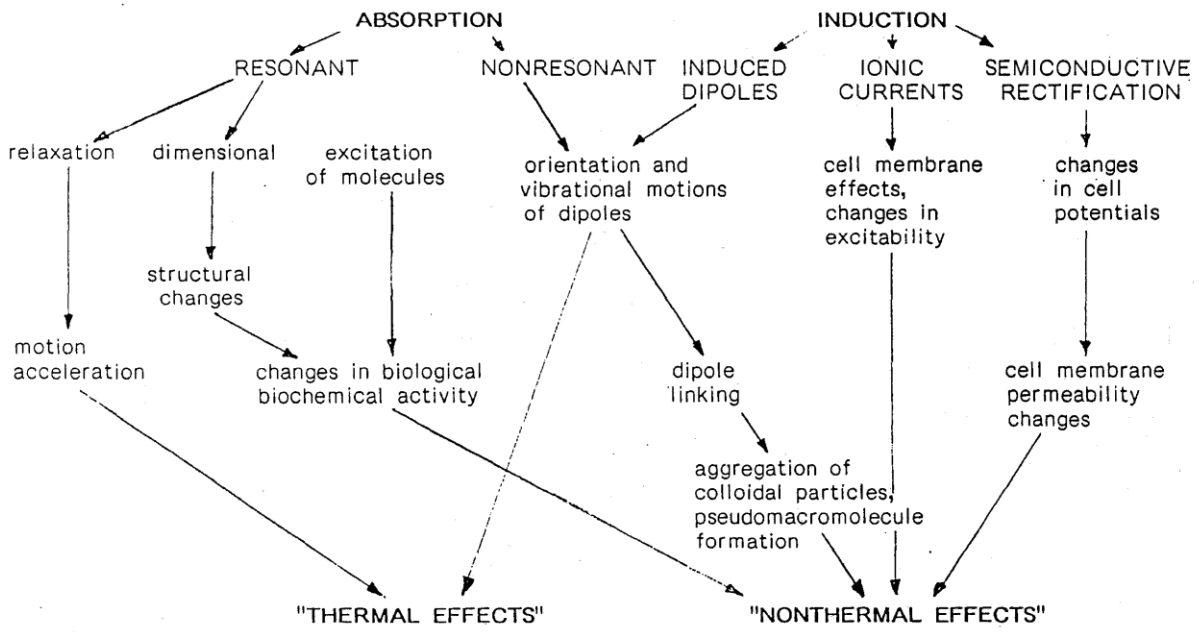
INTERNATIONAL Radiofrequency / Microwave EXPOSURE STANDARDS

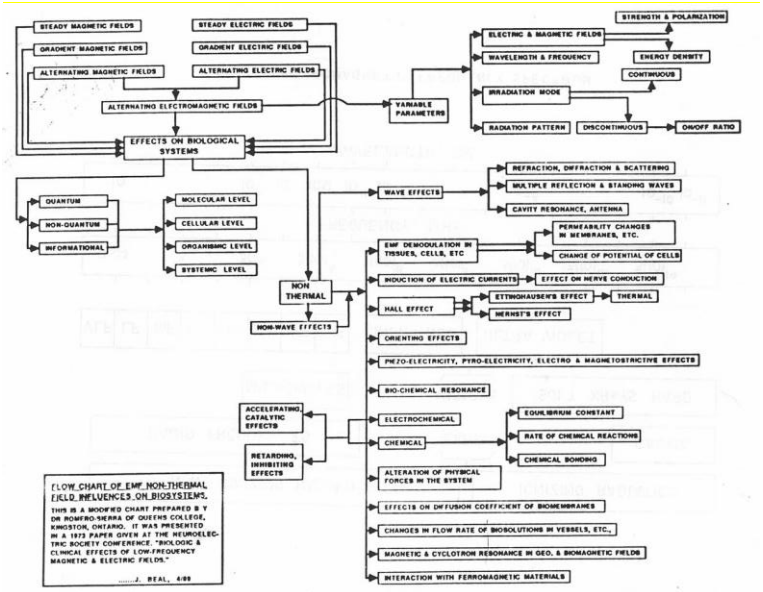
Country	**Exposure level** (*micro*W/cm^2)
New South Wales, Australia	0.001
Salzburg, Austria (pulsed transmissions)	0.1
Council of Europe Resolution 1815 (2011)	**0.33 – 1.0**
Russia / Bulgaria / Hungary/ Switzerland	2–10
Belgium	3
China	7–10
Italy / Toronto	10
Auckland, New Zealand	50
Australia	200
New Zealand / Japan / Germany/ US /Canada	200–1,000
United Kingdom	1,000–10,000

Why do Canada and the US have guidelines that are so much higher than other countries? **Health Canada** guidelines are based on a short-term (6-minute) heating effect on a healthy male adult. It is assumed that, if this radiation does not heat tissue, it is "safe". This is not totally correct.

Other effects, including corrosion (see the boxes as "non-wave-effects": "electrochemical", "chemical" → "rate of chemical reactions"; "chemical bonding", "interaction with ferromagnetic materials"), are documented at intensities well below those that are able to heat body tissue, which were explained in the 1972 **Canadian National Research Council** flow charts shown below:

Possible mechanisms of interaction between microwave radiation and living systems.

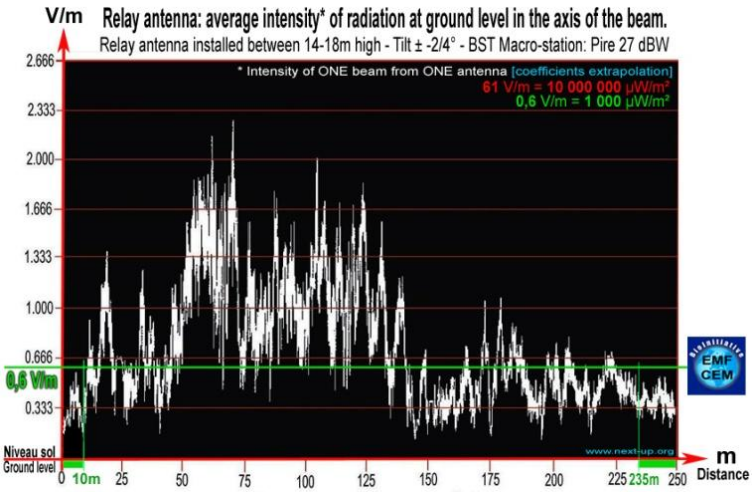




National Research Council of Canada: LTR-CS-98 – **Environmental pollution by microwave radiation – a potential threat to human health,** prepared by Dr. J. A. Tanner, Control Systems Laboratory at NRC and Drs. J. Bigu dell Blanco, C. Romero-Sierra, Queen's University, April 1973.

Exposure from many wireless technology transmitters varies with distance in peaks and troughs.

Even in the open field (without any reflective factors from structures, conductive materials, etc.), exposure varies in peaks and troughs from source, as shown below. This may be an extremely important point to raise and determine in dealings with officials, suppliers, school boards, etc.



Indoor background wireless emission level increase 2008 - 2010

Levels of emissions associated with indoor wireless 500 MHz -10.0 GHz emissions is the table below, which is helpful in understanding also the indoor scatter phenomenon of populations of individuals subjected to external emissions.

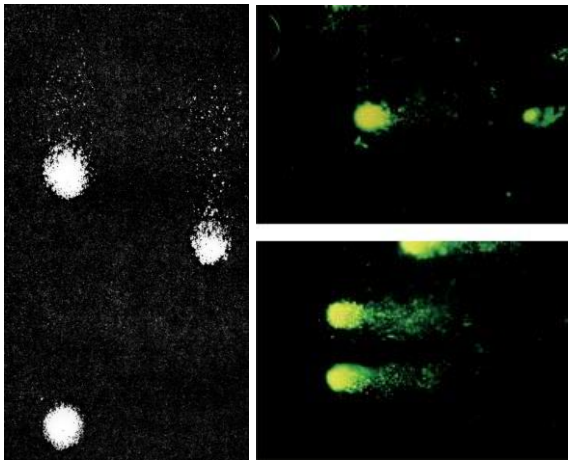
Metro Toronto Convention Centre, average wireless 500 MHz – 10 GHz indoor environmental exposure
Same 10m^2 zone, similar 3–day (mid-November) period, similar usage/population characteristics.

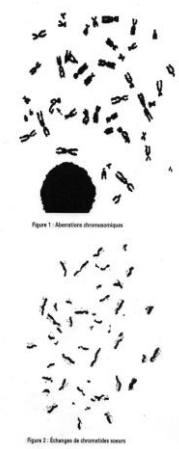
2008: Background - 0.10 *micro*Watt/cm^2
2009: Background - 1.10 *micro*Watt/cm^2
2010: Background - 7.00 *micro*Watt/cm^2
[**higher, in presence of cell phones & other wireless technology devices**]

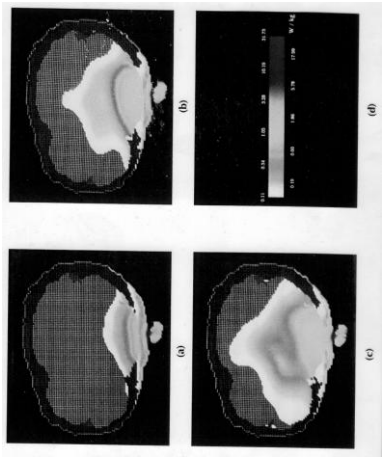
Note: In 2010, with crowd dynamics and densities (>10 individuals within 20m^2), whether using wireless technology appliances or not, in sustained – more than 6 minute intervals - environmental exposure / absorption **rates increased to 13 - 15 *micro*Watt/cm^2, above the exposure limit standard** allowed in several nations, and by the **City of Toronto Board of Health** (10 µWatt/cm^2).

Important biological effects associated with wireless technology emissions, especially children - illustration

The de-granulation of brain cells (left), centre, chromosome changes from non-thermal exposure to cell phone level emissions is shown below. Centre: a comet assay of a normal cell shows little DNA damage; below, the same assay of cells exposed to typical cell phone shows "tails" of damaged DNA. (Henry Lai). To the right is shown the penetration of heat into brain by cell phone emissions. A: adult, B: 10 year-old, C: 5 year-old. The IEEE Whole Body SAR – Specific Absorption Rate for the whole body is 0.4 Watt/Kilogram – and 1.6 W/Kg for ears; the actual SAR from typical cellphones EXCEEDS standards: 2.93 W/Kg for the brain of adults, 3.21 W/Kg for 10 year-olds' brains and 4.49 W/Kg for 5 year-olds' brains. These levels are conducive to non-reversible non-thermal effects. O. P. Ghandi, 1996 IEEE *Trans Microwave Theory & Techniques* 44:1884-97







APPENDIX 1

Governments and organizations that ban or warn against wireless technology

1993: Environmental Protection Agency (EPA): The FCC's exposure standards are "seriously flawed." Official comments to the FCC on guidelines for evaluation of electromagnetic effects of radio frequency radiation, FCC Docket ET 93-62, November 9, 1993.

1993: Food and Drug Administration (FDA): "FCC rules do not address the issue of long-term, chronic exposure to RF fields." Comments of the FDA to the FCC, November 10, 1993.

1993: National Institute for Occupational Safety and Health (NIOSH): The FCC's standard is inadequate because it "is based on only one dominant mechanism—adverse health effects caused by body heating." Comments of NIOSH to the FCC, January 11, 1994.

1994: Amateur Radio Relay League Bio-Effects Committee: "The FCC's standard does not protect against non-thermal effects." Comments of the ARRL Bio-Effects Committee to the FCC, January 7, 1994.

2000: UK Department of Education: Children under 16 should not use cell phones except in an emergency. http://www.cellular.co.za/news_2000/news-08052000_uk_schools_warned_over_radiation.htm

2002: Interdisciplinary Society for Environmental Medicine (3000 physicians in Germany) recommends banning cell phone use by children and banning cell phones and cordless phones in preschools, schools, hospitals, nursing homes, events halls, public buildings and vehicles. http://www.bioprotechnology.com/Press_FREIBURGER_APPEAL.aspx

2003: American Bird Conservancy and **Forest Conservation Council:** Brought a lawsuit against the FCC because millions of migratory birds were being disoriented by microwave radiation and crashing into cell towers. http://www.ewire.com/display.cfm/Wire_ID/1498

2004: International Association of Fire Fighters opposes communication antennas on fire stations. http://www.iaff.org/HS/Facts/CellTowerFinal.asp

2005: Salzburg, Austria's Public Health Department bans WLAN and DECT phones in public schools. http://www.mastsanity.org/index.php?option=com_docman&task=doc_download&gid=2&Itemid=64

August 2005: Austrian Medical Association: Warns against Wi-Fi, cordless phones, and cell phone use by children. http://www.thepeoplesinitiative.org/Wifi_and_Schools.html

August 2005: Vienna Medical Association warns against Wi-Fi, and cell phone use by children up to age 16. http://www.mastsanity.org/index.php?option=com_docman&task=doc_download&gid=2&Itemid=64

2006: Frankfurt, Germany's government states it will not install WiFi in its schools until it has been shown to be harmless. http://www.icems.eu/docs/deutscher_bundestag.pdf

2006: UK schools remove their wireless networks: Prebandal Preparatory School, Chichester, West Sussex; Ysgol Pantycelyn School in Carmarthenshirem, Wales; and Stowe School, in Buckinghamshire, England. *London Times,* November 20, 2006. http://www.timesonline.co.uk/tol/life_and_style/education/article642575.ece

2007: Ballinderry Primary School, Ireland: Removed Wi-Fi to protect young children. http://www.ni4kids.com/Features/article.aspx?listing_id=d5bdd25f-90bc-41c1-aeb1-f974ab325edf&cat_id=3286371c-bbaf-4c93-985c-e2d13117659a

2007 Bavaria, Germany's Parliament recommends against Wi-Fi in schools. http://www.icems.eu/docs/deutscher_bundestag.pdf

2007 Australian Democrats: The "explosion in wireless communications technology" is causing widespread illness. http://www.democrats.org.au/docs/2007/Joining_the_Dots_ExecSummary.pdf

2007: European Environmental Agency, Europe's top environmental watchdog, calls for immediate action to reduce exposure to radiation from Wi-Fi, mobile phones and their masts. http://www.nzherald.co.nz/world/news/article.cfm?c_id=2&objectid=10463870

2008: International Commission on Electromagnetic Safety (comprised of scientists from 16 nations): Recommends limiting cell phone use by children, teenagers, pregnant women and the elderly. http://www.icems.eu/resolution.htm

2007: Thorold, Ontario closes down its citywide Wi-Fi pilot scheme. http://www.glastonburynaturalhealth.co.uk/WhyWi-Fi.html

2008: Lakehead University, Ontario bans Wi-Fi on campus. http://policies.lakeheadu.ca/policy.php?pid=178

2008: Madhya Pradesh, India: Bans cell phones in schools by both students and teachers. http://www.indiaedunews.net/Madhya_Pradesh/Teachers,_students_unhappy_with_mobile_phone_ban_in_schools_5241/

2008: National Library of France: Removes Wi-Fi because of health concerns and limits installation to cable connections. http://www.next-up.org/pdf/FranceNationalLibraryGivesUpWiFi07042008.pdf

2008: Paris, France removes Wi-Fi from four public libraries because of health concerns. http://www.accessmylibrary.com/coms2/summary_0286-35451555_ITM

2008 Sainte-Geneviève University, Paris: Removes Wi-Fi from its library because of health concerns. http://www.next-up.org/pdf/AnalysisWiFiHotSpotsDeactivationSainteGenevieveLibraryParis24052008.pdf

2008: Progressive Librarians Guild recommends against wireless technology in libraries. http://libr.org/plg/wifiresolution.php

2008: Russian National Committee for Non-Ionizing Radiation Protection warns that cell phones are unsafe even for short conversations. Children under 16, pregnant women, epileptics, and people with memory loss, sleep disorders and neurological diseases should never use cell phones. http://www.radiationresearch.org/pdfs/rncnirp_children.pdf

2008 Sebastopol, California: Reneges on its contract to install citywide Wi-Fi. http://www.boingboing.net/2008/03/24/town-of-sebastopol-c.html

2008: University of Pittsburgh Cancer Institute: Children should never use a cell phone except in an emergency. http://www.post-gazette.com/pg/08205/898803-114.stm

2008: Voice (UK Teachers Union) calls for a ban on Wi-Fi in schools. http://www.voicetheunion.org.uk/index.cfm/page/_sections.content.cfm/cid/1326/navid/434/parentid/330

2009: Hérouville Saint-Clair, France: Bans Wi-Fi in public schools. http://www.wifiinschools.org.uk/4.html

2009: Irish Doctors Environmental Association: Warns that current safety guidelines are "not appropriate." http://www.ideaireland.org/

2009: Karnataka State, India: Bans cell phones in all schools and pre-university colleges. http://www.hindu.com/2009/09/14/stories/2009091454460500.htm

May 2009: U.S. Fish and Wildlife Service urges Congress to focus on the potential connection between electromagnetic fields and "Bee Colony Collapse". http://electromagnetichealth.org/electromagnetic-health-blog/emf-and-warnke-report-on-bees-birds-and-mankind/

July, 2010: France prohibits advertising cell phones to children under 14; prohibits children up to age 14 from using cell phones in pre-schools and public schools; requires cell phones to be labelled with SAR values and a recommendation to use headsets. http://www.next-up.org/pdf/Legifrance_Loi_nr_2010_788_du_12_07_2010_article_183_et_184_code_postes_et_des_communications_electroniques.pdf.

DOCTORS AND SCIENTISTS CALLING FOR STRICTER REGULATION AND/OR A MORATORIUM ON WIRELESS TECHNOLOGY http://international-emf-alliance.org/index.php/appeals, http://www.ralf-woelfle.de/elektrosmog/redir.htm?http://www.ralf-woelfle.de/elektrosmog/allgemein/appelle.htm, http://www.avaate.org/IMG/doc/Alcalaci.doc

Vienna Resolution 1998
Salzburg Resolution 2000
Declaration of Alcalá 2002
Catania Resolution 2002
Freiburger Appeal 2002
Bamberger Appeal 2004
Maintaler Appeal 2004
Coburger Appeal 2005
Stockacher Appeal 2005
Oberammergauer Appeal 2005
Haibacher Appeal 2005
Pfarrkirchener Appeal 2005
Freienbacher Appeal 2005
Lichtenfelser Appeal 2005
Hofer Appeal 2005
Helsinki Appeal 2005
Parish Kirchner Appeal 2005
Saarlander Appeal 2005
Benevento Resolution 2006
Allgäuer Appeal 2006
WiMax Appeal 2006
Brussels Appeal 2007
Schlüchterner appeal
Venice Resolution 2008
Berlin Appeal 2008
Paris Appeal 2009
London Resolution 2009
Porto Alegre Resolution 2009
European Parliament EMF Resolution 2009
Dutch Appeal 2009
Int'l Appeal of Würzburg 2010
European Council Resolution 1815 (2011)

Groups File Suit to Halt Mass Bird Deaths at Gulf Coast Communication Towers

WASHINGTON, DISTRICT OF COLUMBIA, Feb. 13 -/E-Wire/-- Three conservation organizations today filed a lawsuit in Federal District Court in Washington, D.C. against the Federal Communications Commission ("FCC"). The groups, Forest Conservation Council (Santa Fe, NM), American Bird Conservancy (Washington, D.C.), and Friends of the Earth (Washington D.C.) seek to enjoin the FCC from issuing any new licenses for the building of communication towers in the Gulf Coast region until their impact on migratory birds has been fully assessed and mitigated.

In the suit the plaintiffs cite violations by the FCC of the Migratory Bird Treaty Act, National Environmental Policy Act ("NEPA"), and Endangered Species Act ("ESA") in the deaths of thousands of migrating birds at towers along the Gulf Coast. Attracted to the structures, particularly at night and during periods of low visibility, birds collide with the towers, their guy wires, and related structures. The U.S. Fish and Wildlife Service ("USFWS") estimates that as many as 50 million birds are killed each year in tower collisions throughout the United States.

The specific structures at issue are located in the general region of the Gulf Coastal Plain, a 100_mile wide belt along the southern Gulf Coast from Port Isabel, Texas to Tampa Bay, Florida, a region of recognized critical stopover points for neo-tropical migratory birds. These points represent the first landfall after the long flight across the Gulf of Mexico each spring. The birds are often exhausted and weakened by the migration and are particularly vulnerable to sources of mortality. One Florida tower studied has killed more than 44,000 birds of 186 species.

The lawsuit documents that 5,820 towers were illegally authorized using a loophole in environmental regulations called a Categorical Exclusion. This blanket exemption allows companies to build towers harmful to migratory birds, with no environmental review or public oversight, while escaping NEPA requirements. As a remedy, the lawsuit seeks a Court order preventing any new towers from being built until the FCC completes a comprehensive Environmental Impact Statement ("EIS") on its tower licensing decisions in the Gulf Coast, implements requirements for bird protection measures before issuing future licenses, and initiates public participation procedures.

"The unregulated jumble of communication towers littering the coastal forests, wetlands, farmlands, and barrier islands of the Gulf Coast region are killing tens, maybe hundreds of thousands of migratory birds each year," said John Talberth, Forest Conservation Council's Director of Conservation. "Today's lawsuit is the first step in a broader campaign to reform the haphazard and illegal way the FCC and the communications industry do business and to bring the public into the decision-making process."

The USFWS has already recognized the need for a comprehensive EIS on the FCC's tower licensing program and has objected to the Categorical Exclusions from NEPA claimed by the FCC. In a November 2, 1999 letter to then FCC Chairman William Kennard, the USFWS Director wrote: "The Service believes that FCC should prepare a programmatic Environmental Impact Statement to delineate the true impacts of tower construction and to identify ways to reduce those impacts by incorporating measures in the applicant's permits to minimize potential losses to migratory birds."

A comprehensive report published by American Bird Conservancy (www.abcbirds.org/policy/towerkillweb.pdf) documents 230 species killed at towers _ nearly 40% of all U.S. bird species _ 52 of which are listed as being of conservation concern. With more than 60,000 registered towers over 199 ft. nationwide and an estimated 50,000 additional towers to be constructed in the next decade, the impacts on protected avian species will continue to be significant.

"The 5,800 plus towers in the Gulf Coast region are potential avian death traps in a major migratory area. Our repeated efforts to work with the FCC and industry have not produced change and our law suit is critical to ending the slaughter of millions of birds," said Gerald Winegrad, Vice President for Policy at American Bird Conservancy. "American Bird Conservancy has long been concerned about the millions of birds killed unnecessarily at communication towers. Many of the birds most commonly killed neo-tropical migratory songbirds such as warblers, vireos, and orioles are already in decline and this added mortality to protected species must be addressed."

Today's lawsuit comes on the heels of a lengthy battle with the FCC over its communication tower decisions. Since 1999, the Plaintiffs have been seeking a remedy to their concerns over migratory bird deaths through many administrative avenues involving the FCC. Plaintiffs have participated in the USFWS Communication Tower Working Group, have held repeated meetings at the FCC with FCC officials, have formally challenged individual towers harmful to migratory birds, and, most recently, filed a formal petition asking the FCC to prepare an EIS on its Gulf Coast communication tower decisions. Despite these repeated meetings and requests, the FCC has continued to authorize thousands of new towers harmful to migratory birds without any environmental review and without providing any public participation opportunities.

"For years, Friends of the Earth has pressed numerous requests for the FCC to end this slaughter but instead the agency has authorized thousands of new towers hat have killed millions of birds," said Norman L. Dean, executive director of Friends of the Earth. "And they've done it behind closed doors, without environmental review and without public participation."

For a copy of the Complaint, please visit Forest Conservation Council's Website: www.forestconservation.org/whatsnew.htm For more details on tower kills and a color photo of a Northern Harrier [hawk] split in two on a tower guy wire, visit ABC's Website at www.abcbirds.org

APPENDIX 2

Sage Associates study notes potential standard violations by California electricity utility SMART meters

Data Tables

Distance at which FCC Safety Limit is exceeded for 655 μW/cm^2 **time-weighted average** (TWA) limit: 1 & 4 meters
Distance at which FCC Safety Limit is exceeded for 571/624 μW/cm^2 TWA limit for One Collector, 1C + 3 Smart Meters
Distance at which FCC Safety Limit is exceeded for **peak power limit** of 4000 μW/cm^2 for 1 SM, 4 SM; 1Collector, 1C + 3 SM)

FCC Violation Tables

FCC Violations of the 655 μW/cm^2 FCC limit at the face at 6" (One Meter, Four Meters)
FCC Violations of the 571/624 μW/cm^2 FCC limit at 6" at the face (One Collector, 1C + 3 SM)
FCC Violations of the 655 μW/cm^2 FCC limit at 11" in the Nursery (One Meter, Four Meters)
FCC Violations of the 571/624 μW/cm^2 FCC limit at 11" in the Nursery (One Collector, 1C + 3 SM)
FCC Violations of the 655 μW/cm^2 FCC limit at 28" in the Kitchen (One Meter, Four Meters)
FCC Violations of the 571/624 μW/cm^2 FCC limit at 28" in the Kitchen (One Collector, 1C + 3 SM)
Potential FCC Violations of Peak Power Limit of 4000 μW/cm^2 at 3" (One SM, 4 SM)
Potential FCC Violations of Peak Power Limit of 4000 μW/cm^2 at 3" (One Collector, 1C + 3 SM)

Health Comparisons – Nursery / Bedroom (**100% reflective factor**: 5 to 751 μW/cm^{2}continuous exposure)
(Dependent on duty cycles of meter, whether single meter, multiple SMART meters, collector meters)

Nursery RF level associated with **Inhibition of DNA Repair in Human Stem Cells** (92.5 μW/cm^2, 24 & 72h exposure – *Markova et al, 2009*) (One SM, 4 SM)

Nursery RF level associated with **Inhibition of DNA Repair in Human Stem Cells** (92.5 μW/cm^2, 24 & 72h exposure – *Markova et al, 2009*) (One Collector, 1 C + 3 SM)

Nursery RF level associated with **Pathological Leakage of the Blood-brain Barrier** (0.4 to 8 μW/cm^2, chronic exposure - *Persson et al, 1997*) (One SM, 4 SM)

Nursery RF level associated with **Pathological Leakage of the Blood-brain Barrier** (0.4 to 8 μW/cm^2, chronic exposure - *Persson et al, 1997*) (One Collector, 1 C + 3 SM)

Nursery RF level associated with **Adverse Health Symptoms from Cell Tower Studies** (8 studies in total reporting sleep disruption, headache, fatigue, memory loss, concentration difficulties, irritability, increased cancer risk) (0.01 μW/cm^2 with chronic exposure - *Kundi, 2009; Khurana et al, 2010*) (One SM, 4 SM)

Nursery RF level associated with **Adverse Health Symptoms from Cell Tower Studies** (8 studies in total reporting sleep disruption, headache, fatigue, memory loss, concentration difficulties, irritability, increased cancer risk) (0.01 μW/cm^2 with chronic exposure - *Kundi, 2009; Khurana et al, 2010*) (One Collector, 1 C + 3 SM)

Health Comparisons – Kitchen (**up to 1,000% increase reflective factor** stainless steel or other metallic surfaces)
(Dependent on duty cycles of meter, whether single meter, multiple SMART meters, collector meters)

Kitchen RF level associated with **Inhibition of DNA Repair in Human Stem Cells** (92.5 μW/cm^2, 24 & 72h exposure – *Markova et al, 2009*) (One SM, 4 SM)

Kitchen RF level associated with **Inhibition of DNA Repair in Human Stem Cells** (92.5 μW/cm^2, 24 & 72h exposure – *Markova et al, 2009*) (One Collector, 1 C + 3 SM)

Kitchen RF level associated with **Pathological Leakage of the Blood-brain Barrier** (0.4 to 8 μW/cm^2, chronic exposure - *Persson et al, 1997*) (One SM, 4 SM)

Kitchen RF level associated with **Pathological Leakage of the Blood-brain Barrier** (0.4 to 8 μW/cm^2, chronic exposure - *Persson et al, 1997*) (One Collector, 1 C + 3 SM)

Kitchen RF level associated with **Adverse Health Symptoms from Cell Tower Studies** (8 studies in total reporting sleep disruption, headache, fatigue, memory loss, concentration difficulties, irritability, increased cancer risk) (0.01 $\mu W/cm^2$ with chronic exposure - *Kundi, 2009; Khurana et al, 2010*) (One SM, 4 SM)

Kitchen RF level associated with **Adverse Health Symptoms from Cell Tower Studies** (8 studies in total reporting sleep disruption, headache, fatigue, memory loss, concentration difficulties, irritability, increased cancer risk) (0.01 $\mu W/cm^2$ with chronic exposure - *Kundi, 2009; Khurana et al, 2010*) (One Collector, 1 C + 3 SM)

RF level ***exceeds Medtronics Metal Implant Advisory for MRI SAR Exposure*** of 0.1 W/Kg at Frequencies also used in SMART meters at 11" (One SM, 4 SM)

RF level ***Exceeds Medtronics Metal Implant Advisory for MRI SAR Exposure*** of 0.1 W/Kg at Frequencies also used in SMART meters at 11" (One Collector, 1 C + 3 SM)

Predicted RF levels exceed ***BioInitiative Report*** recommended limit of 0.1 $\mu W/cm^2$ (One SM, 4 SM)

Predicted RF levels exceed ***BioInitiative Report*** recommended limit of 0.1 $\mu W/cm^2$ (1 Collector 1C + 3 SM)

Sage Associates report excerpt

In addition to exceeding FCC public safety limits under some conditions of installation and operation, smart meters can produce excessively elevated RF exposures, depending on where they are installed. With respect to absolute RF exposure levels predicted for occupied space within dwellings, or outside areas like patios, gardens and walk-ways, RF levels are predicted to be substantially elevated within a few feet to within a few tens of feet from the meter(s).

For example, one smart meter at 11" from occupied space produces somewhere between 1.4 and 140 microwatts per centimeter squared ($\mu W/cm^2$) depending on the duty cycle modeled. Since ***FCC OET 65*** specifies that continuous exposure be assumed where the public cannot be excluded (such as is applicable to one's home), this calculation produces an RF level of 140 $\mu W/cm^2$at 11" using the FCCs lowest reflection factor of 60%. Using the FCC's reflection factor of 100%, the figures rise to 2.2 $\mu W/cm^2$– 218 $\mu W/cm^2$, where the continuous exposure calculation is 218 $\mu W/cm^2$ (Table 12). These are very significantly elevated RF exposures in comparison to typical individual exposures in daily life. Multiple smart meters in the nursery/bedroom example at 11" are predicted to generate RF levels from about 5 to 481 $\mu W/cm^2$at the lowest (60%) reflection factor; and 7.5 to 751 $\mu W/cm^2$ using the FCCs 100% reflection factor. Such levels are far above typical public exposures.

RF levels at 28" in the kitchen work space are also predicted to be significantly elevated with one or more smart meters (or a collector meter alone or in combination with multiple smart meters). At 28" distance, RF levels are predicted in the kitchen example to be as high as 21 $\mu W/cm^2$from a single meter and as high as 54.5 $\mu W/cm^2$with multiple smart meters using the lower of the FCCs reflection factor of 60%. Using the FCCs higher reflection factor of 100%, the RF levels are predicted to be as high as 33.8 $\mu W/cm^2$for a single meter and as high as 85.8 $\mu W/cm^2$for multiple smart meters. For a single collector meter, the range is 60.9 to 95.2 $\mu W/cm^2$, at 60% & 100% reflection factors, respectively.

Table 16 illustrates predicted violations of peak power limit (4000 $\mu W/cm^2$) at 3" from the surface of a meter. FCC violations of peak power limit are predicted to occur for a single collector meter at both 60% and 100% reflection factors. This situation might occur if someone touches a smart meter or stands directly in front.

Consumers may also have already increased their exposures to radiofrequency radiation in the home through the voluntary use of wireless devices (cell and cordless phones), PDAs like *BlackBerry* and *iPhones*, wireless routers for wireless internet access, wireless home security systems, wireless baby surveillance (baby monitors), and other emerging wireless applications.

Neither the FCC, the CPUC, the utility nor the consumer know what portion of the allowable public safety limit is already being used up or pre-empted by RF from other sources already present in the particular location a smart meter may be installed and operated.

Consumers, for whatever personal reason, choice or necessity who have already eliminated all possible wireless exposures from their property and lives, may now face excessively high RF exposures in their homes from smart meters on a 24-hour basis. This may force limitations on use of their otherwise occupied space, depending on how the meter is located, building materials in the structure, and how it is furnished.

People who are afforded special protection under the federal ***Americans with Disabilities Act*** are not sufficiently acknowledged nor protected. People who have medical and/or metal implants or other conditions rendering them vulnerable to health risks at lower levels than FCC RF limits may be particularly at risk. This is also likely to hold true for other subgroups, like children and people who are ill or taking medications, or are elderly, for they have different reactions to pulsed RF. Childrens' tissues absorb RF differently and can absorb more RF than adults (Christ *et al*, 2010; Wiart *et al*, 2008). The elderly and those on some medications respond more acutely to some RF exposures.

Safety standards for peak exposure limits to radiofrequency have not been developed to take into account the particular sensitivity of the eyes, testes and other ball shaped organs. There are no peak power limits defined for the eyes and testes, and it is not unreasonable to imagine situations where either of these organs comes into close contact with smart meters and/or collector meters, particularly where they are installed in multiples (on walls of multi-family dwellings that are accessible as common areas).

In summary, no positive assertion of safety can be made by the FCC, nor relied upon by the CPUC, with respect to pulsed RF when exposures are chronic and occur in the general population. Indiscriminate exposure to environmentally ubiquitous pulsed RF from the rollout of millions of new RF sources (smart meters) will mean far greater general population exposures, and potential health consequences. Uncertainties about the existing RF environment (how much RF exposure already exists), what kind of interior reflective environments exist (reflection factor), how interior space is utilized near walls), and other characteristics of residents (age, medical condition, medical implants, relative health, reliance on critical care equipment that may be subject to electronic interference, etc) and unrestrained access to areas of property where meter is located all argue for caution.

APPENDIX 3

EASY SHIELDING OPTIONS WITH BUILDING MATERIALS & MESHES

Figure 10-2
Measurement setup to determine the insertion loss presented by a conductive mesh (chicken wire in this case).

Table 10-1
Insertion loss measurement results for three different types of metal lath expressed as a reduction factor (F) and in decibels (dB).

	Panel A lath		Panel B lath		Panel C lath	
Frequency band	F	dB	F	dB	F	dB
900 MHz	2.5	4.1	8.9	9.5	82	19.1
2.4 GHz	1.3	1.2	2.6	4.2	14	11.4

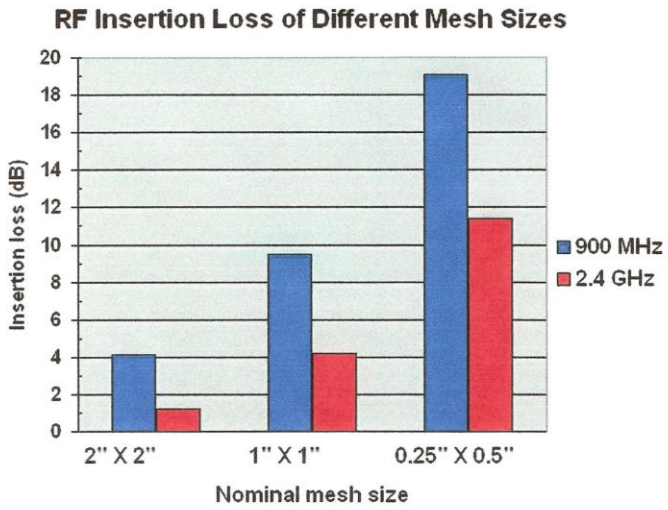


Figure 10-3
Insertion loss of three different metal mesh sizes.