

## Havas Submission to CCST “Report on Smart Meters”.

For those interested, below is my invited submission to CCST as part of a *Technical Response Team*.

**Date:** October 12, 2010  
**From:** Magda Havas, BSc, PhD  
**To:** CCST

Submission on Smart Meters.

[Item 1. Whether FCC standards for Smart Meters are sufficiently protective of public health taking into account current exposure levels to radiofrequency and electromagnetic fields.](#)

In my opinion, the FCC standard for Smart Meters is **not** sufficient to protect public health. This is based on the following facts:

- 1.1 Thermal vs. Non-thermal Debate.** The thermal vs. non-thermal debate is largely a red herring that has been perpetuated for decades and has influenced the type of research done in the United States. The FCC standard is based on a **thermal** effect. It was originally based on the amount of radiation that would heat an adult male in the US military exposed to radar. While the heating effect is not disputed, biological effects, some of which have adverse health consequences, occur well below the thermal guideline ([Inglis 1970](#)). As a consequence various countries in the world are opting for a “**biologically**” based guideline rather than a “**thermal**” guideline, which takes into account not only adult males in peak physical conditions but children, pregnant women, the elderly, and those who have developed electrohypersensitivity (EHS). I will return to the concept of EHS later.
- 1.2 Guidelines** in Russia, Switzerland, Poland, and China are well below the FCC standard (i.e. 10 vs. 1000 microW/cm<sup>2</sup> or 1% of FCC guidelines). Some military and government insiders tried to get U.S. guidelines reduced decades ago but were not successful ([Pollack and Healer 1967](#), [Dodge 1969](#)). [Steneck et al. \(1980\)](#) provides an excellent account of how the U.S. standards were established for radio frequency radiation.
- 1.3 Our exposure to radio frequency radiation (RFR) is increasing exponentially** as we design more equipment that relies on higher frequencies in the electromagnetic spectrum. Prior to World War II, this type of radiation was negligible. Today we have radar (military, marine, aviation, and weather), we have cell phone antennas, radio and TV broadcast antennas, and a growing number of WiFi hotspots, citywide WiFi and Wi-Max antennas. Inside buildings we have cordless phones, many of which emit microwave radiation even when they are not being used; wireless alarm systems; wireless baby monitors, wireless computers, iPads, and Smart Phones that can connect to wireless internet or WiFi. More children are playing wireless video games than ever before and radio frequency identification devices (RFID) are placed into

merchandise to provide information to the manufacturer about consumer habits. The “smart meter” is just another source of exposure that will be placed on every home and in every apartment. Smart meters are being used to monitor use of electricity, gas and water. As part of this system, appliances are being designed to communicate directly with smart meters, all in a wireless mode, which will ultimately increase levels of radiation in the home.

- 1.4** I work with people who have become **electrically hypersensitive (EHS)** and I have received emails and phone calls from those who have had smart meters placed on their homes. They complain of ill health and many are unable to use the room closest to the smart meter. These individuals have no place to “hide” from the growing levels of electrosmog especially in densely populated urban centers. Sickness contributes to time off work and away from school, growing medical costs and a general poorer quality of life. Children are particularly vulnerable as are pregnant women and those with compromised immune systems. The presence of metal implants in the body (such as metal pins in bones) may concentrate the absorption of radiation at the location of implantation, inducing thermal effects from lower power densities than would ordinarily cause such harm (Massey 1979). Some implants, such as pace makers and deep brain stimulators for Parkinson’s disease, may malfunction and this can be fatal. In Switzerland about 5% of the population has EHS. If the same fraction of the population has EHS in the US that would come to a staggering 15 million people!

The symptoms following exposure to radio frequency radiation were labeled radiowave sickness and were first reported for those occupationally exposed in the former Soviet Union. These same symptoms are now referred to as electrohypersensitivity (EHS) and are experienced by a growing fraction of the population. They include . . .

*“ . . . headache, eyestrain and tearing, fatigue and weakness, vertigo, sleeplessness at night and drowsiness during the day, moodiness, irritability, hypochondria, paranoia, either nervous tension or mental depression and memory impairment. After longer periods of exposure, additional complaints may include sluggishness, inability to make decisions, loss of hair, pain in muscles and in the heart region, breathlessness, sexual problems and even a decrease in lactation in nursing mothers. Clinically observed effects in persons voicing these complaints include trembling of the eyelids, fingers and tongue, increased perspiration of the extremities, [and] rashes . . . ” (Massey, 1979).*

- 1.5** In addition to sensitive people, Switzerland also identifies *Places of Sensitive Use* (German acronym is OMEN). These places include: living rooms; classrooms and kindergartens; hospitals and nursing homes; permanent jobs (where people spend more than 2.5 days per week); and playgrounds. For these OMEN sites, the Swiss government recommends that greater precaution be taken for long-term exposure to weak radiation. In these places, radiation from wireless microwave base stations (such as cordless phones or WLAN/WiFi) may exceed radiation from nearby cell phone base stations and hence these devices must generate emissions as low as possible. For more information visit <http://www.bag.admin.ch/themen/strahlung/00053/index.html?lang=en>

Item 2. Whether additional technology specific standards are needed for Smart Meters and other devices that are commonly found in and around homes, to ensure adequate protection from adverse health effects.

**2.1 Technology specific standards are definitely needed** for Smart meters as well as cordless phones, DECT baby monitors, wireless routers, and all of the other devices that emit radio frequency radiation.

Massey, in a report published by Duke Law Journal in 1979, identifies nine variables that need to be considered when determining the impact of microwave radiation. These are “power density, intensity and relative phase of all field components, specific frequency ranges, waveform characteristics, exposure regimes, specific occupations, level of control over exposed populations, individual differences (age, sex, health, specific predisposing factors) and presence of other environmental stressors.” The current FCC guidelines do NOT take these into consideration.

**2.2** We have evidence that **pulsed microwave frequencies**, that are generated by WiFi and cordless phones are more harmful than continuous wave and yet this is not considered in the FCC guidelines ([Reno 1975](#)).

The key microwave emitting devices in the home/office/school environment are:

Cordless phones (some are labeled DECT and others pulsed digital 2.4 GHz). These radiate all the time even when no one is using them. They should be replaced by wired phones or cordless phones currently available in Europe, which are “on-demand” phones that radiate only when the handset is not in the cradle of the base station. These phones are so dangerous that I recently submitted a Petition to the Auditor General of Canada to have DECT phones banned ([Havas 2008](#)).

The DECT baby monitor also radiates all the time, as does the receiver that is often carried on the Mother’s waist. Here we need a voice-activated baby monitor that is used in Europe.

Wireless Internet (WiFi or WLAN) is not as common in Europe as they are in North America. There they prefer using wired service in the form of fiber optic and Ethernet connections. Germany hotels ask that you bring an Ethernet cables with you, as they don’t provide WiFi. The Swiss government is providing free fiber optics to schools provided they don’t install wireless routers.

**2.3** An additional point I would like to make relates to **dirty electricity**.

Wires can act like antennas and the radiation produced by radio frequency generating devices can flow along and reradiate from wires both inside and outside the home. This contributes to dirty electricity and localized radiation exposure. Dirty electricity has been associated with cancers ([Milham and Morgan 2008](#)); health and behavior problems in schools ([Havas and Olstad 2008](#)); and both diabetes and multiple sclerosis ([Havas 2006](#)). From a human health perspective and to protect sensitive electronic equipment it is

important to maintain good power quality and to prevent radiation from smart meters flowing along wires.

In conclusion, I have great concern regarding the **current levels of microwave radiation** in North America. Instead of promoting wireless technology, we should be promoting wired technology and reserving wireless for situations where wired is not possible (while one is traveling for example). Shortly after X-rays were discovered, they were used in shoe stores to determine shoe-size for young children. Fortunately, we recognized that X-rays were harmful and we restricted their use to essential medical diagnoses. We need to recognize that microwaves are also harmful and we cannot use this technology in a frivolous manner. With more frequencies being used, with the levels of radiation increasing, and with so little research on the long-term, low-level effects of this technology we are creating a potential time bomb. If smart meters are placed on every home, they will contribute significantly to our exposure and this is both unwise and unsafe.

## *References*

Dodge, CH. 1969. Clinical and Hygienic Aspects of Exposure to Electromagnetic Fields: A Review of the Soviet and Eastern European Literature. Biological Effects and Health Implications of Microwave Radiation, Symposium Proceedings, Richmond, Virginia, September 17-19, 1969 (BRH/DBE 70-2) (PB 193 898). [http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge\\_1969.pdf](http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf)

Havas, M 2006. Electromagnetic Hypersensitivity: Biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis. *Electromagnetic Biology and Medicine*, 25: 259-268. <http://www.electricalpollution.com/documents/Havas2006.pdf>

Havas, M 2008. Request that first generation DECT Phones be Banned in Canada, Environment Petition, Auditor General of Canada, 15 pp. [http://www.oagbvg.gc.ca/internet/English/pet\\_253\\_e\\_31629.html](http://www.oagbvg.gc.ca/internet/English/pet_253_e_31629.html)

Havas, M and A Olstad. 2008. Power quality affects teacher wellbeing and student behavior in three Minnesota Schools. *Science of the Total Environment*, Volume 402, Issues 2-3, 1 September 2008, pp. 157-162. [http://www.electricalpollution.com/documents/08\\_Havas&Olstad\\_schools-1.pdf](http://www.electricalpollution.com/documents/08_Havas&Olstad_schools-1.pdf)

Inglis, L.P. 1970. Why the double standard? – A critical review of Russian work on hazards of microwave radiation. IEEE International Symposium on Electromagnetic Compatibility, July 14-16, 1970. <http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/08/Inglis.pdf>

Massey, KA. 1979. The Challenge of Nonionizing Radiation: A Proposal for Legislation. *Duke Law Journal*, Volume 1979, No. 1. 86 pp. <http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/10/Massey-1979.pdf>

Milham, S and LL Morgan. 2008. A New Electromagnetic Exposure Metric: High Frequency Voltage Transients Associated With Increased Cancer Incidence in Teachers in a California School. *Amer. J. Ind. Med.* 8 pp. <http://onlinelibrary.wiley.com/doi/10.1002/ajim.20598/abstract>

Pollack, H. and J. Healer. 1967. Review of the Information on Hazards to Personnel from High-Frequency Electromagnetic Radiation. Institute for Defense Analyses, Research and Engineering Support Division. Internal Note N-451, IDA/HQ 67-6211, Series B, copy 5 of 15, 15 pages.[http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/07/Pollack\\_19671.pdf](http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/07/Pollack_19671.pdf)

Reno, VR. 1975. Some considerations concerning the use of magnetron generators in microwave biological research. Naval Aerospace Medical Research Laboratory, Pensacola, Florida. Approved for Public release. Distribution unlimited. 11 pp.  
[http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/09/Reno\\_Pulsed\\_Waves.pdf](http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/09/Reno_Pulsed_Waves.pdf)

Steneck, NH, HJ Cook, AJ Vander and GL Kane. 1980. The Origins of U.S. Safety Standards for Microwave Radiation. Science, Vol. 208, 13 June 1980.  
[http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/06/steneck\\_science\\_1980.pdf](http://www.magdahavas.com/wordpress/wpcontent/uploads/2010/06/steneck_science_1980.pdf)

### ***Chronology:***

*On July 30, 2010*, California State Assembly Member Jared Huffman (San Rafael) asked the California Council on Science and Technology (CCST) to provide an assessment of the safety of Smart Meters.

*On August 16, 2010*, CCST agreed to compile and assess the evidence available to address the following two issues:

1. Whether FCC standards for Smart Meters are sufficiently protective of public health taking into account current exposure levels to radiofrequency and electromagnetic fields.
2. Whether additional technology specific standards are needed for Smart Meters and other devices that are commonly found in and around homes, to ensure adequate protection from adverse health effects.

*On October 4, 2010*, I was invited to be part of a Technical Response Team and, as part of that team, I was asked to provide a written response to two key concerns mentioned above.

*On October 12, 2010*, I submitted my report to CCST.

*On December 13, 2010*, I was informed that CCST was not appending any documents to their report, nor were they making these documents available to others, but they were recognizing those who contributed.

*On January 11, 2011*, CCST released their report “Health Impacts of Radio Frequency from Smart Meters” on their website: <http://www.ccst.us/news/2011/20110111smart.php>. CCST is receiving public comments until January 31, 2011.