



Karolinska Institutet
Department of Neuroscience
Experimental Dermatology Unit

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**Clark's Office
N.C. Utilities Commission**

Stockholm, January 14, 2016

**To: Edward S. Finley, Jr., Chairman [finley@ncuc.net]
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, NC 27699-4300, USA**

Subject: DOCKET NO. E-100, SUB 141 - Oppose Smart Meter Opt-Out Tariffs

Dear Chairman Finley and Public Staff,

My name is Olle Johansson, and I am an associate professor at the Karolinska Institute, home of the famous Nobel Prize in Physiology or Medicine, Department of Neuroscience, and head of The Experimental Dermatology Unit. I have worked for many years in the field of EMF radiation and health effects, and am counted among my peers as a world-leading authority. Among many achievements I have coined the term "screen dermatitis". I have published more than 600 original articles, reviews, book chapters, statements, resolutions, and conference reports, within the fields of basic and applied neuroscience, dermatoscience, epidemiology, and biophysiology, and is one of the authors behind The Benevento Resolution (2006), The Venice Resolution (2008), The London Resolution (2009), The Bioinitiative Report (2007; updated 2012) as well as the Seletun Statement (2010), all dealing with artificial electromagnetic fields and health. [For a short excerpt from my CV, please, see <http://vetapedia.se/olle-johansson-associate-professor-ki/>]

I am writing to urge you to oppose smart meter opt-out tariffs. People opt-out of smart meter installation for several reasons (see below), with health being the primary reason. The utility industry uses inapplicable health safety standards, which I will explain below, and flawed reasoning to promote smart meter safety. I therefore strongly urge you to reject smart meter opt-out tariffs. Such tariffs penalize the people who can least afford it - those whose health suffers from electromagnetic exposures.

The possibility of any health consequences of chronic exposure to pulsed microwave exposure from smart meters is often denied. However, in the current field of science, the present state-of-the-art regarding this issue is not so simple.

Wireless communication is now being implemented in our daily life in a very fast way. At the same time, it is becoming more and more obvious that the exposure to electromagnetic fields not only may induce acute thermal effects to living organisms, but also non-thermal effects, the latter often after longer exposures. This has been demonstrated in a very large number of studies and includes cellular DNA-damage, disruptions and alterations of cellular functions like increases in intracellular stimulatory pathways and calcium handling, disruption of tissue

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structures like the blood-brain barrier, impact on vessel and immune functions, and loss of fertility. Whereas scientists can observe and reproduce these effects in controlled laboratory experiments, epidemiological and ecological data derived from long-term exposures reflect in well-designed case-control studies the link all the way from molecular and cellular effects to the living organism up to the induction and proliferation of diseases observed in humans. It should be noted that we are not the only species at jeopardy, practically all animals and plants may be at stake. Although epidemiological and ecological investigations as such never demonstrate causative effects, due to the vast number of confounders, they confirm the relevance of the controlled observations in the laboratories.

Because the effects are reproducibly observed and links to pathology cannot be excluded, the precautionary principle should be in force in the implementation of this new technology within the society. This will be the only method to support the sustainability of these innovative wireless communication technologies. The February 2, 2000 European Commission Communication on the Precautionary Principle notes: "The precautionary principle applies where scientific evidence is insufficient, inconclusive or uncertain and preliminary scientific evaluation indicates that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the high level of protection chosen by the EU". Therefore, policy makers immediately should strictly control exposure by defining biologically-based maximal exposure guidelines also taking into account long-term, non-thermal effects, and including especially vulnerable groups, such as the elderly, the ill, the genetically and/or immunologically challenged, children and fetuses, and persons with the functional impairment electrohypersensitivity.

In November, 2009, a Scientific Panel comprised of international experts on the biological effects of electromagnetic fields met in Seletun, Norway, for three days of intensive discussion on existing scientific evidence and public health implications of the unprecedented global exposures to artificial electromagnetic fields (EMF) from telecommunications and electric power technologies. This meeting was a direct consequence of on-going discussions already from the mid-nineties, when cellular communications infrastructure began to rapidly proliferate, and stretching through, among many, the Benevento (2006), Venice (2008) and London (2009) Resolutions from this decade, and involving important conclusions drawn from the 600-page Bioinitiative Report published August 31, 2007, which was a review of over 2,000 studies showing biological effects from electromagnetic radiation at non-thermal levels of exposure, which partly was published subsequently in the journal *Pathophysiology* (Volume 16, 2009). The Bioinitiative Report has, in addition, recently been updated (2012).

I have worked for many years trying to clarify the potential dangers of this 24/7, whole-body, artificial EMF irradiation. Along this struggle I have been proud to coauthor some of the most important compilations of the up-to-date knowledge, including (among many) most of

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the ones above.

The Seletun Scientific Statement (2011) recommends that lower limits be established for electromagnetic fields and wireless exposures, based on scientific studies reporting health impacts at much lower exposure levels. Many researchers now believe the existing safety limits are inadequate to protect public health because they do not consider prolonged exposure to lower emission levels that are now widespread.

The body of evidence on electromagnetic fields requires a new approach to protection of public health; the growth and development of the fetus, and of children; and argues for strong preventative actions. These conclusions are built upon prior scientific and public health reports documenting the following:

- 1) Low-intensity (non-thermal) bioeffects and adverse health effects are demonstrated at levels significantly below existing exposure standards.
- 2) ICNIRP/WHO and IEEE/FCC public safety limits are inadequate and obsolete with respect to prolonged, low-intensity exposures.
- 3) New, biologically-based public exposure standards are urgently needed to protect public health world-wide.
- 4) It is not in the public interest to wait.

- EMR exposures should be reduced now rather than waiting for proof of harm before acting. This is in keeping with traditional public health principles, and is justified now given abundant evidence that biological effects and adverse health effects are occurring at exposure levels hundreds to thousands of times below existing public safety standards around the world.

- There is a need for mandatory pre-market assessments of emissions and risks before deployment of new wireless technologies. There should be convincing evidence that products do not cause health harm before marketing. Such decisions may have to be quickly revised given new evidence.

- The use of telephone lines (land-lines) or fiber optic cables for SmartGrid type energy conservation infrastructure is recommended. Utilities should choose options that do not create new, community-wide exposures from wireless components of SmartGrid-type projects. Future health risks from prolonged or repetitive wireless exposures of SmartGrid-type systems may be avoided by using fiber-optic cable. Energy conservation is endorsed but not at the risk of exposing millions of families in their homes to a new, involuntary source of wireless radiofrequency radiation, the effect of which on their health not yet known.

Furthermore, based on the available scientific data, the Seletun Scientific Panel states that:

- Sensitive populations (for example, the elderly, the ill, the genetically and/or

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immunologically challenged) and children and fetuses may be additionally vulnerable to health risks; their exposures are largely involuntary and they are less protected by existing public safety standards.

- It is well established that children are more vulnerable to health risks from environmental toxins in general.
- The Panel strongly recommends against the exposure from wireless systems of children of any age.
- The Panel strongly recommends against the exposure from wireless systems of pregnant women.

This is all in accordance with the intentions of the Precautionary Principle as summarized by Mats Dänvik and myself in our paper from 2010.

I encourage governments to adopt a framework of guidelines for public and occupational EMF exposure that reflect the Precautionary Principle. The Precautionary Principle states when there are indications of possible adverse effects, though they remain uncertain, the risks from doing nothing may be far greater than the risks of taking action to control these exposures. The Precautionary Principle shifts the burden of proof from those suspecting a risk to those who discount it — as some nations have already done. Precautionary strategies should be based on design and performance standards and may not necessarily define numerical thresholds because such thresholds may erroneously be interpreted as levels below which no adverse effect can occur.

You often hear about "safe levels" of exposure and that there is "no proof of health effects", but my personal response to these seemingly reassuring statements is that it is very important to realize, from a consumer's point of view, that "no accepted proof for health effects" is not the same as "no risk". Too many times, 'experts' have claimed to be experts in fields where actually the only expert comment should have been: "I/we just do not know". Such fields were e.g. the DDT, X-ray, radioactivity, smoking, asbestos, BSE, heavy metal exposure, depleted uranium, etc., etc., etc., where the "no risk"-flag was raised before true knowledge came around. Later on, the same flag had to be quickly lowered, many times after enormous economic costs and suffering of many human beings. Along those lines, it is now (regarding "the protection from exposure to electromagnetic fields" issue) very important to clearly identify the background and employment (especially if they sit, at the same time, on the industry's chairs) of every 'expert' in different scientific committees, and likewise. It is, of course, very important (maybe even more important?) to also let 'whistleblowers' speak at conferences, to support them with equal amounts (or even more?) of economical funding as those scientists and other 'experts' who, already from the very beginning, have declared a

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certain source or type of irradiation, or a specified product, to be 100% safe – sometimes even before having properly examined them!

In the case of "protection from exposure to electromagnetic fields", it is thus of paramount importance to act from a prudence avoidance/precautionary principle point of view. Anything else would be highly hazardous! Total transparency of information is the key sentence here; I believe consumers are very tired of always having the complete truth years after a certain catastrophe already has taken place. For instance, it shall be noted, that today's recommendation values for wireless systems, the SAR-value, are just recommendations, and not safety levels. Since scientists observe biological effects at as low as 20 microWatts/kg, is it then really safe to irradiate humans with 2 W/kg (i.e., with 100,000 times stronger radiation!), which is the recommendation level for us? And, furthermore, it is very strange to see, over and over again, that highly relevant scientific information is suppressed or even left out in various official documents, as high up as at the governmental level of society. This is not something that the consumers will gain anything good from, and, still, the official declaration or explanation (from experts and politicians) very often is: "If we (=the experts) would let everything out in the open, people would be very scared and they would panic." Personally, I have never seen this happen, but instead I have frequently seen great disappointment from citizens who afterwards have realized they have been fooled by their own experts and their own politicians.

Another misunderstanding is the use of scientific publications (as the tobacco industry did for many years) as 'weights' to balance each other. But you can NEVER balance a report showing a negative health effect with one showing nothing! This is a misunderstanding which, unfortunately, is very often used both by the industrial representatives as well as official authorities. The general audience, naturally, easily is fooled by such an argumentation, but if you are bitten by a deadly poisonous snake, what good does it make for you that there are 100 million harmless snakes around?

In many commentaries, debate articles and public lectures - for the last 20-30 years – I have urged that completely independent research projects must be inaugurated immediately to ensure our public health. These projects must be entirely independent of all types of commercial interests; public health cannot have a price-tag! It is also of paramount importance that scientists involved in such projects must be free of any carrier considerations and that the funding needed is covered to 100%, not 99% or less. This is the clear responsibility of the democratically elected body of every country.

Many smart meters are close to beds, kitchens, playrooms, and similar locations. These wireless systems are never off, and the exposure is not voluntary. The smart meters are being forced on citizens everywhere. Based on this, the inauguration of smart meters with grudging and involuntary exposure of millions to billions of human beings to pulsed microwave

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radiation should immediately be prohibited until 'the red flag' can be hauled down once and for all.

According to Joshua Hart [<http://stopsmartmeters.org>], utility customers in the USA have noticed huge increases in their bill after a smart meter is installed—in some cases hundreds of dollars more than usual. Utilities claim the meters are accurate, but unexplained over-billing has featured in many negative reports, all around the US, the UK, and so forth. The same is standard also in Sweden.

Just as we are learning that cell phones are associated with brain tumours, why are we installing the same technology on, or in, everyone's homes, often with no right to opt out? Thousands of people have complained of tinnitus, headaches, nausea, sleeplessness, heart arrhythmia, and other symptoms after a smart meter was installed. Wireless technology is nowadays considered a potential public health hazard, and already have lawsuits been won. Smart meters can violate already high FCC/ICNIRP recommended limits on human exposure to microwave radiation, and are being installed even as people are developing electrohypersensitivity (which in Sweden is a recognized functional impairment). There are also reports of smart meter interference with pacemakers and other implants. Should we not value our health, and the health of our family and friends?

When a smart meter is installed, your utility has access to a treasure trove of information about your electricity usage, compromising your privacy. Depending on the regulatory protections – and enforcement of those rules – in your country, they will be able to sell this information to a series of corporations and the government. The American Civil Liberties Union in Vermont and The American Civil Liberties Union in Hawaii have both condemned the lack of consumer privacy protection. The civil liberties and the right to privacy is not to be tampered with.

Smart meters do not result in energy savings, thus not cutting carbon emissions, according to Reuters*. They may even increase energy consumption. There is also emerging evidence that wireless, non-ionizing radiation (from cell phones, wifi, and smart meters) harms wildlife and damages trees. There have been direct reports of such radiation affecting vital bee populations and disturbing bird habitat.

[*<http://af.reuters.com/article/idAFLDE6860P520100908?pageNumber=2&virtualBrandChannel=0>].

The American utility company PG&E claims that they are retaining 80% of their meter readers. What they do not tell you is that several years back, they transitioned their meter readers from full time to temporary so the job loss would not appear so drastic. Utilities look upon smart meters as an easy way to boost profits by cutting jobs. We can not afford to lose thousands and thousands of jobs in our current anemic economy.

At least hundreds of electrical fires, explosions, and other electrical hazards have been caused

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by smart meters, and have resulted in numerous media stories. Most smart meters are not UL (Underwriters Laboratories) certified, as is required by electrical code for all electric appliances within the home. In addition, whistleblowers have reported unsafe installations. Smart meters are also potential ignition sources, and may thus violate fire regulations that put the safety of residents first. They also remove utility personnel from neighbourhoods.

The conversion to smart meters is one of the largest technology rollouts in history, and yet virtually no public consultation with ratepayers or local governments was carried out in advance. The California Public Utilities Commission, an appointed (not elected) body who is charged with regulating utility companies, ignored popular local opposition for years – though finally and belatedly producing an opt-out in early 2012 that costs the PG&E customers hundreds of dollars just to avoid a recognized possible carcinogen by the World Health Organization (WHO; May 31, 2011). Around the world utility companies continue to install smart meters, often without public awareness or consent. This is a genuine threat to our democracy and informed decision-making as also pointed out by Joshua Hart [for further details, see <http://stopsmartmeters.org>]

I recently received a letter from a citizen where her electricity provider is telling her that she needs to have the new smart meter installed. The letter indicated that this billion-dollar program would provide the following benefits to her:

1. Automatically detect power outages. Here she was currently relying on the fact that the lights did not go on.
2. Access to her hourly electrical data. Does she really need to know this and will she actually look at it? She used to rely on her bill to tell her how much electricity she consumed.
3. Ensure her bill was based on actual consumption. All along she had thought that she was paying for actual consumption. There may have been an estimated bill here and there but in the end she always believed that she had paid for all the electricity she consumed.

Am I, and is she, missing something? I can not figure out why she and other taxpayers need to spend a billion pound to tell her what she already know or care to know.

In summary, there is already a huge number of scientific papers clearly demonstrating adverse health effects generated by radiofrequency signals used by smart meters; the FCC/ICNIRP recommendations are not applicable to such radiofrequency signals and smart meters; and I strongly urge you to support a no-tariff opt-out option. To force a tariff to opt-out of installation and a monthly additional fee to have the smart meter read, easily can be

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devastating for the average family.

Your work is – to say the least – of the greatest importance. You may save lives, as well as protect the general health, for now and for the future. That is what counts.

It is a great honour to communicate with you! *GOOD LUCK!*

With my very best regards
Yours sincerely

Olle Johansson, associate professor

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