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Docket No.: E-00000C-11-0328

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June 26, 2013

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1200 West Washington Street

Phoenix, Arizona 85007

Dear Commissioners:

The Santa Cruz County, CA, Board of Supervisors requested of the County Health Department a report on smart meters. The report has been issued, approved by County legal counsel. It expresses "strong concerns about health effects from smart meter radiation exposures," in the words of Susan Brinchman, blogger. This report asks the "county to impose another moratorium on installations. In addition, the health department asks the county supervisors to sign a petition to postpone the CPUC opt-out ruling until independent investigations and public health hearings are conducted."

Ms. Brinchman continues, "Many portions of this report pertain to all municipalities where smart meters are being used and is a model for other communities."

You may already have the report. I am providing Susan Brinchman's blog. In much of it the wording of the report is used. The last two sheets here are the actual Attachment 2: References from the report.

Thank you for seeking additional information on the health effects of smart meters. I can't thank you enough.

Sincerely,

Helen S Pierce

Arizona Corporation Commission

DOCKETED

JUN 28 2013

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Docket No: E-00000C-11-0328

LaMesa-MountHelix

Blog | Susan Brinchman's Blog

California Health Department Cites Smart Meter Health Risks in Report

The department asks county supervisors to sign a petition to postpone the CPUC opt-out ruling until independent investigations and public health hearings are conducted.

Posted by [Susan Brinchman](#), January 23, 2012 at 05:22 pm

22 Comment

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SMART METERS DANGER Microwaves Electromagnetic Interference



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The first California County Health Department smart meter report has been issued in Santa Cruz, CA, expressing strong concerns about health effects from smart meter radiation exposures, asking their county to impose another moratorium on installations.

In addition, the health department asks the county supervisors to sign a petition to postpone the CPUC opt-out ruling until independent investigations and public health hearings are conducted. Many portions of this report pertain to all municipalities where smart meters are being used and is a model for other communities.

This health department report, approved by County legal council, was issued at the request of the Santa Cruz County Board of Supervisors (BOS).

In a cover letter to the BOS, Health Department Administrator Mauriello states,

"The Public Health Officer's report is provided as Attachment B. The report discusses the health risks associated with SmartMeters, the scientific reports and actions the public might take to mitigate potential harm."

In addition:

"This office and County Counsel believe that notwithstanding the enforcement challenges, that it is in the best interest of public health, safety, and welfare for your Board to adopt the attached ordinance (Attachment A) implementing a temporary moratorium on the installation of SmartMeters in or on any home, apartment, condominium or business within the unincorporated areas of the County".

Further, the County health department advises that their Board of Supervisors sign a formal petition to the CPUC to request additional public hearings and information gathering concerning smart meter radiation exposures and safety issues before final opt-out decisions are made, and independent investigation of rf radiation exposures from smart meters, particularly in the cases involving grouping of meters, such as where multi-family dwellings are located, such as apartments or condos; where gas and electric meters are located together; and in the circumstances where a home has (more high-powered and thus, higher radiation emissions) a collector meter, or relay, for other local neighborhood meters.

(Note: requests to San Diego Gas & Electric to identify homes with collector meters have gone unanswered. Those customers likely have no idea that they even have a collector meter, nor of their potential increased risk from higher rf radiation emissions.)

The full health department report, county ordinance issuing a moratorium, and petition to the CPUC is found at top right in Media, as part of this Patch article and is a must-read for anyone questioning or concerned about smart meters. This is a report that we encourage you to share with your local, county, and state health departments as well as your local town or city councilmembers and county board of supervisors.

From Attachment B: The Santa Cruz County Department of Health Smartmeter Report (selected excerpts, with emphasis by blog author):

"Subject: Health Risks Associated With SmartMeters

Agenda: January 24, 2012

To: Santa Cruz County Board of supervisors

From: Poki Stewart Namkung, M.D., M.P.H.

Health Officer

Jan. 13, 2012

Subject: Health Risks Associated With SmartMeters

Overview

On December 13, 2011, Santa Cruz County Board of Supervisors directed the Public Health

Officer to return on January 24, 2012, with an analysis of the research on the health effects of SmartMeters.

Background

In order to analyze the potential health risks associated with SmartMeters, the following questions should be asked:

- 1) What is the SmartMeter system and what is the potential radiation exposure from the system?
- 2) What scientific evidence exists about the potential health risks associated with SmartMeters?
- 3) Are there actions that the public might take to mitigate any potential harm from SmartMeters?

SmartMeters are a new type of electrical meter that will measure consumer energy usage and send the information back to the utility by a wireless signal in the form of pulsed frequencies within the 800 MHz to 2400MHz range, contained in the microwave portion of the electromagnetic spectrum.

SmartMeters are considered part of 'smart grid' technology that includes: a) a mesh network or series of pole-mounted wireless antennas at the neighborhood level to collect and transmit wireless information from all SmartMeters in that area back to the utility; b) collector meters, which are a special type of SmartMeter that collects the radiofrequency or microwave radiation signals from many surrounding buildings (500-5000 homes or buildings) and sends the information back to the utility; and c) proposed for the future, a power transmitter to measure the energy use of individual appliances (e.g. washing machines, clothes dryers, dishwasher, etc) and send information via wireless radio frequency signal back to the SmartMeter. The primary rationale for SmartMeters and grid networks is to more accurately monitor and direct energy usage.

The public health issue of concern in regard to SmartMeters is the involuntary exposure of individuals and households to electromagnetic field (EMF) radiation. EMFs are everywhere, coming from both natural and man-made sources.

The three broad classes of EMF are:

- extremely low frequency, ELF (from the sun or powerlines)
- **radio frequency, RF (from communication devices, wireless devices, and SmartMeters)**
- extremely high frequency, known as ionizing radiation (x-rays and gamma rays)

Much of this exposure is beyond our control and is a matter of personal choice; however, public exposure to RF fields is growing exponentially due to the proliferation of cell phones, and wireless fidelity (Wi-Fi) technology. ...

the frequency of the electromagnetic radiation and are expressed in units of microwatts per centimeter squared. A SmartMeter contains two antennas whose combined time averaged public safety limit of exposure is 655i.W/cm² (Sage, 2011).

According to the California Council on Science and Technology (CCST) Report (2011), within distances of three to ten feet, SmartMeters would not exceed this limit. However, CCST did not account for the frequency of transmissions, reflection factors, banks of SmartMeters firing simultaneously, and distances closer than three feet.

There are numerous situations in which the distance between the SmartMeters and humans is less than three feet on an ongoing basis, e.g. a SmartMeter mounted on the external wall to a bedroom with the bed placed adjacent to that mounting next to the internal wall.

That distance is estimated to be one foot. The CCST Report also states that SmartMeters will generally transmit data once every four hours, and once the grid is fully functional, may transmit "more frequently."

It has been aptly demonstrated by computer modeling and real measurement of existing meters that SmartMeters emit frequencies almost continuously, day and night, seven days a week. Furthermore, it is not possible to program them to not operate at 100% of a duty cycle (continuously) and therefore it should not be possible to state that SmartMeters do not exceed the time-averaged exposure limit.

Additionally, exposure is additive and consumers may have already increased their exposures to radiofrequency radiation in the home through the voluntary use of wireless devices such as cell and cordless phones, personal digital assistants (PDAs), routers for internet access, home security systems, wireless baby surveillance (baby monitors) and other emerging devices. It would be impossible to know how close a consumer might be to their limit, making safety a uncertainty with the installation of a mandatory SmartMeter.

This report will focus on the documented health risks of EMF in general, the relevance of that data to SmartMeters exposure, the established guidelines for RF safety to the public at large, and then provide recommendations to ameliorate the risk to the public's health.

Evidence-based Health Risks of EMFs

There is no scientific literature on the health risks of SmartMeters in particular as they are a new technology. However, there is a large body of research on the health risks of EMFs.

Much of the data is concentrated on cell phone usage and as SmartMeters occupy the same energy spectrum as cell phones and depending on conditions, can exceed the whole body radiation exposure of cell phones phones (see Attachment B1, Figure 4). In terms of health risks, the causal factor under study is RF radiation whether it be from cell phones, Wi-Fi routers, cordless phones, or SmartMeters.

Therefore all available, peer-reviewed, scientific research data can be extrapolated to apply to SmartMeters, taking into consideration the magnitude and the intensity of the exposure.

Since the mid-1990's the use of cellular and wireless devices has increased exponentially exposing the public to massively increased levels of RF. There is however, debate regarding the health risks posed to the public given these increased levels of radiation. It must be

noted that there is little basic science funding for this type of research and it is largely funded by industry.

An intriguing divide, noted by Genuis, 2011 is that most research carried out by independent non-government or non-industry affiliated researchers suggests potentially serious effects from many non-ionizing radiation exposures; most research carried out by independent non-government or non-industry affiliated researchers suggests potentially serious effects from many non-ionizing radiation exposures research funded by industry and some governments seems to cast doubt on the potential for harm.

Elements of the controversy stem from inability to replicate findings consistently in laboratory animal studies. However, analysis of many of the conflicting studies is not valid as the methodology used is not comparable.

Despite this controversy, evidence is accumulating on the results of exposure to RF at non-thermal levels including increased permeability of the blood-brain barrier in the head (Eberhardt, 2008), harmful effects on sperm, double strand breaks in DNA which could lead to cancer genesis (Phillips, 2011), stress gene activation indicating an exposure to a toxin (Blank, 2011), and alterations in brain glucose metabolism (Volkow, 2011).

In terms of meta-analyzed epidemiological studies, all case-control epidemiological studies covering ;:10 years of cell phone use have reported an increased risk of brain tumors from the use of mobile phones (Hallberg, 2011).

Other studies have pointed to an increasing risk of acoustic neuroma, salivary gland tumors, and eye cancer after several years of cell phone use and the tumors occur predominantly on the same side of the head as the phone is used.

The analysis of brain cancer statistics since the mid 20th century in several countries reveals that brain tumor formation has a long latency time, an average of over 30 years to develop from initial damage.(Hallberg, 2011).

Therefore using studies such as the Interphone Study which looked as shorter latency periods for the development of specific brain cancers will result in inconclusive data.

Another potential health risk related to EMF exposure, whose legitimacy as a phenomenon remains contentious, is electromagnetic hypersensitivity (EHS). In the 1950's, various centers in Eastern Europe began to describe and treat thousands of workers, generally employed in jobs involving microwave transmission.

The afflicted individuals often presented with symptoms such as headaches, weakness, sleep disturbance, emotional instability, dizziness, memory impairment, fatigue, and heart palpitations.

Clinical research to verify the physiological nature of this condition did not begin in earnest until the 1990's and found that the EMF involved was usually within the non-ionizing range of the electromagnetic spectrum.

In the early 2000s, estimates of the occurrence of EHS began to swell with studies estimating the prevalence of this condition to be about 1.5% of the population of Sweden (Hilleert et al, 2002), 3.2% in California (Levallios et al, 2002), and 8% in Germany (Infas Institut für angewandte Sozialwissenschaft GmbH, 2003).

In 2004, WHO declared EHS "a phenomenon where individuals experience adverse health effect while using or being in the vicinity of devices emanating electric, magnetic, or electromagnetic fields (EMFs)... Whatever its cause, EHS is a real and sometimes debilitating problem for the affected persons (Mild et al, 2004)."

Currently, research has demonstrated objective evidence to support the EHS diagnosis, defining pathophysiological mechanisms including immune dysregulation in vitro, with increased production of selected cytokines and disruption and dysregulation of catecholamine physiology (Genius, 2011).

Until recently, the diagnosis of EHS has not received much support from the medical community due to lack of objective evidence. In an effort to determine the legitimacy of EHS as a neurological disorder, however, a collection of scientists and physicians recently conducted a double-blinded research study that concluded that "EMF hypersensitivity can occur as a bona fide environmentally-inducible neurological syndrome (McCarty et al, 2011).

Safety Guidelines

The guidelines currently used by the FCC were adopted in 1996, are thermally based, and are believed to protect against injury that may be caused by acute exposures that result in tissue heating or electric shock.

FCC guidelines have a much lower certainty of safety than standards. Meeting the current FCC guidelines only assures that one should not have heat damage from SmartMeter exposure. It says nothing about safety from the risk of many chronic diseases that the public is most concerned about such as cancer, miscarriage, birth defects, semen quality, autoimmune diseases, etc.

Therefore, **when it comes to nonthermal effects of RF, FCC guidelines are irrelevant and cannot be used for any claims of SmartMeter safety unless heat damage is involved** (Li, 2011).

There are no current, relevant public safety standards for pulsed RF involving chronic exposure of the public, nor of sensitive populations, nor of people with metal and medical implants that can be affected both by localized heating and by electromagnetic interference (EMI) for medical wireless implanted devices.

Many other countries (9) have significantly lower RF/MW exposure standards ranging from 0.001 to 50 $\mu\text{W}/\text{cm}^2$ as compared with the US guideline of 200-1 000 $\mu\text{W}/\text{cm}^2$. Note that these recommended levels are considerably lower than the approximately 600 $\mu\text{W}/\text{cm}^2$ (time-averaged) allowed for the RFR from SmartMeters operating in the low 900 MHz band

mandated by the FCC based on only thermal consideration.

In summary, there is no scientific data to determine if there is a safe RF exposure level regarding its non-thermal effects.

The question for governmental agencies is that given the uncertainty of safety, the evidence of existing and potential harm, should we err on the side of safety and take the precautionary avoidance measures? The two unique features of SmartMeter exposure are: 1) universal exposure thus far because of mandatory installation ensuring that virtually every household is exposed; 2) involuntary exposure whether one has a SmartMeter on their home or not due to the already ubiquitous saturation of installation in Santa Cruz County.

Governmental agencies for protecting public health and safety should be much more vigilant towards involuntary environmental exposures because governmental agencies are the only defense against such involuntary exposure. Examples of actions that the public might take to limit exposure to electromagnetic radiation can be found in Attachment B2." (Santa Cruz County Department of Health)

from County of Santa Cruz document

Health Risks Associated With SmartMeters

Agenda: January 24, 2012

Page 6 of 8

Attachment 2

~~exposure. Examples of actions that the public might take to limit exposure to electromagnetic radiation can be found in Attachment B2.~~

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Health Risks Associated With SmartMeters

Agenda: January 24, 2012

Page 7 of 8

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Health Risks Associated With SmartMeters

Agenda: January 24, 2012

Page 8 of 8

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Figure 4 from Hirsch; 2011

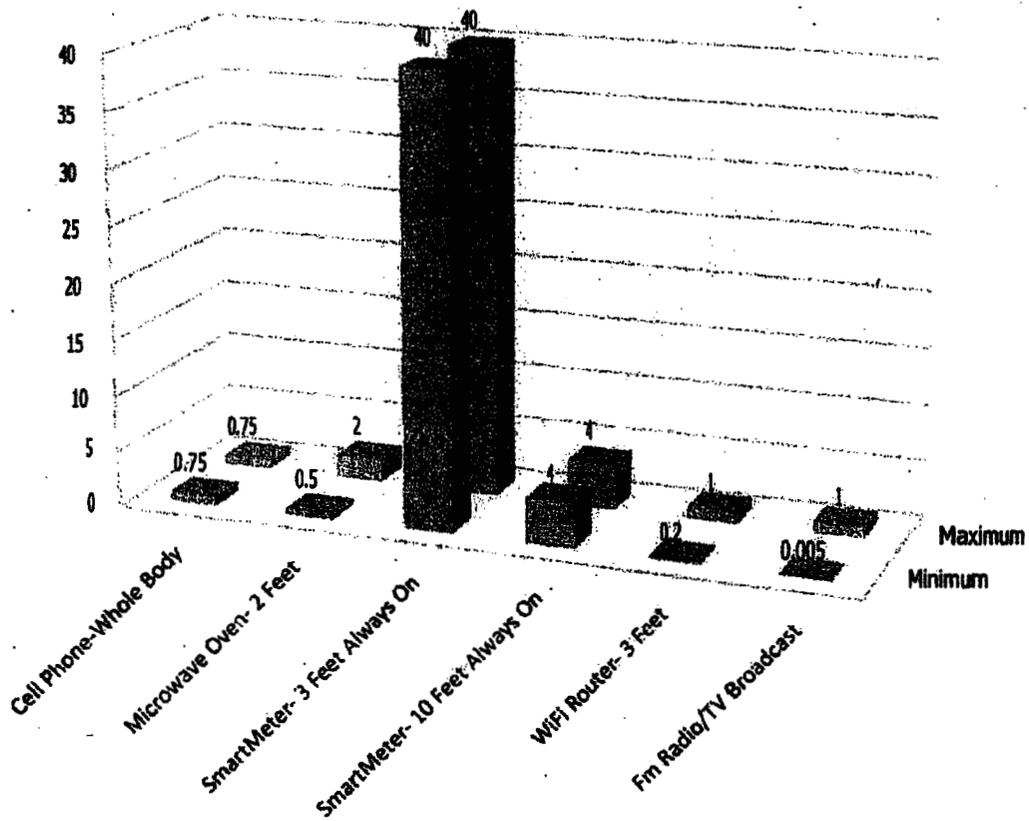


Figure 4. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in μ W/cm² over time [corrected for assumed duty cycle and whole body exposure extrapolated from EPRI/CCST SmartMeter estimated levels at 3 feet].