

331 Shady Ridge Drive
Monroeville, PA 15146

November 29, 2016

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NOV 29 2016

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
P.O. Box 3265
Harrisburg, PA 17105-3265

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

RE: **Michele Hriadil and Francis Hriadil v. Duquesne Light Company**
Docket No. C-2016-2571726

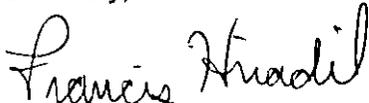
Dear Secretary Chiavetta:

Enclosed please find our written response to the Preliminary Objections of Respondent Duquesne Light Company along with 4 Exhibits referenced in our written response. It has been submitted in accordance with the agreed upon deadline of December 1, 2016.

A copy of this document has been served upon the Respondent's Counsel, Jeremy V Farrell, Esquire, in accordance with Commission regulations.

Please feel free to contact me if you have any questions.

Sincerely,



Francis Hriadil
Complainant
(412) 779-3314
hriadil@attglobal.net

Enclosure

Cc: Jeremy V Farrell, Esquire, Counsel for Duquesne Light Company (with enclosure)

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

**Complainants Response to
PRELIMINARY OBJECTIONS TO
FORMAL COMPLAINT**

Filed by Michele and Francis Hriadil

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Monroeville, PA 15146

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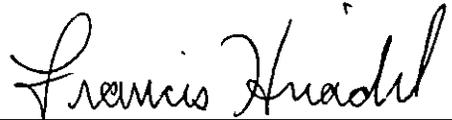
NOV 29 2016

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

COMPLAINANTS RESPONSE to PRELIMINARY OBJECTIONS TO FORMAL COMPLAINT

TO: RESPONDENT'S GENERAL COUNSEL, JEREMY V FARRELL, ESQUIRE, AND LAUREN N RULLI, ESQUIRE .

HERE IS THE FILING OF OUR WRITTEN RESPONSE TO THE PRELIMINARY OBJECTIONS OF RESPONDENT DUQUESNE LIGHT COMPANY. 4 EXHIBITS REFERENCED IN OUR RESPONSE HAVE BEEN SUPPLIED AS WELL. THEY HAVE BEEN SUBMITTED TO YOU PER THE AGREED UPON DEADLINE OF DECEMBER 1, 2016.



Francis Hriadil
November 29, 2016

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

**Complainants Response to
PRELIMINARY OBJECTIONS TO FORMAL COMPLAINT**

TO THE HONORABLE COMMISSION:

We have read the Preliminary Objections of the Respondent's Counsel, Jeremy V Farrell, in its entirety and have the following responses and exceptions:

Overall: Respondent's Counsel filed 6 pages of Preliminary Objections. Upon review of these Objections, we found that the filing is not complete. It appears to be incomplete due to the omission of a page. Two page 4's are included, and there is no page 5. So, we are unaware of what specific content exists on page 5. As a result, we presume that a complete Preliminary Objections document will be re-filed.

Nevertheless, we have the following responses and exceptions to the pages that were included.

1. DLC Counsel's statement: Duquesne Light seeks to dismiss in its entirety this Formal Complaint filed by its customers who wish to opt out of Duquesne Light's smart meter program, citing perceived health, privacy, and safety concerns. Complaint, ¶¶ 4-5. A smart meter has not been installed at Complainants' residence and they have not claimed any existing health conditions relating to a smart meter. Complaint, ¶¶ 4-5. The Commission has already determined (on many occasions) that such complaints are legally insufficient because smart meter programs like Duquesne Light's are mandatory

under Pennsylvania law.¹ (¹ Complainant apparently acknowledges that the installation of smart meters is mandatory. Complaint, ¶ 5.)

Complainants (Our) Response:

1 (a). PA Act 129, as signed by Governor Rendell, has as its first and foremost tenet, § 2807 (f) (2) (i), that EDCs shall furnish smart meter technology “upon request from a customer that agrees to pay the cost of the smart meter at the time of the request”. This is a voluntary opt-in provision which explicitly states that **customers may choose to join the Smart Meter program if they so desire**, and if they do request a Smart Meter, the EDCs cannot deny those requests. It is a matter of fact that we have never requested an opt-in to this Smart Meter program. We have never requested a Smart Meter. And, we have never agreed to pay the cost of a Smart Meter. We have never requested any of this. So, the rote reference to us requesting an opt-out of a program that we never agreed to opt-into is a misrepresentation of the facts of the situation.

In our Formal Complaint, we have simply acknowledged that, as written in the PA Smart Meter Procurement and Installation Implementation Order, there is no explicit statement utilizing the term “opt-out”; but, that does not preclude or supersede the fact that **we have never “opted in.”**

1 (b). With regard to our health concerns, before I can accurately address the objection submitted by Duquesne Lights Counsel, it first needs to be clearly stated what is being installed and how it operates. Duquesne Light is intending to install the SK9AMI7 OpenWay Smart Meter manufactured by Centron/Itron. There are 2 versions of this meter that are being installed on homes: the Standard model and the Cell Relay.

The Standard model possesses 2 transceivers. The first one is a 900 MHz transceiver which pulse radiates 100s to 1000s of times a day to communicate with the other Smart Meters in the grid, and/or with the Cell Relay, if it is sufficiently

close. The second one is a 2.4 GHz transceiver which pulse radiates 100s and 1000s of times a day to communicate with any Smart Appliances that are in the house. These transceivers put out frequent repeated Radio Frequency (RF) pulses.

The Smart Meter gets the power to do this from a Switch-Mode Power Supply. That is, they contain AC/DC switching circuitry that interrupts the normal current flow to provide current to the transceivers in small, very fast pulses. This causes Voltage Spiking on the home's interior electrical wiring, on the home's 60 Hz interior electrical grid, which effectively turns the home's interior electrical wiring grid into a radiating antenna. This effect pulses LF radiation throughout the entire house, in addition to and in conjunction with the RF radiation pulses. So, 2 forms of pulsed radiation are produced.

The Cell Relay possesses these 2 transceivers, plus an additional transceiver that is designed for wireless connection to the cellular WWAN. It relays the data received from the various Smart Meters in the grid over a private connection to the EDC. The transceivers use the same frequency bands used by cell phones. Two different frequency bands are used by these Cell Relay transceivers, either the 850 MHz band or the 1900 MHz band. So, these Cell Relays contain an additional transceiver and are transmitting even more than the Standard models. The homeowner is not informed of which version is being installed on his/her residence, and has no say in the matter.

If any of this is factually incorrect, then we request that Duquesne Light please indicate where any of these statements are in error.

1 (c). *Of course, we do not claim that we have been and are being harmed by a Smart Meter that has not yet been installed on our residence. **We claim that the intended Smart Meter, and the Smart Mesh Grid that it is a component of, have been demonstrated in a multitude of independent reputable analyses to be a***

credible threat of harm. These assessments, which have been carried out by numerous recognized technical and medical authorities, are well documented. They comprise more current, complete, and comprehensive analyses than the early, limited, and selective analyses used to provide preliminary validation of this technology. These early analyses have subsequently been shown to be outdated, questionable or in error, and wholly inadequate.

For example, there is the often cited claim that "it has been proven that there are no health effects from Smart Meters." This is a claim that is made by EDCs, including Duquesne Light. These claims have been soundly refuted by many experts, including:

1. **Exhibit 1 of 4:** (2 pages) David Carpenter M.D., Public Health Physician and Former Dean of the School of Public Health at the University at Albany, on the faulty report by the California Council on Science and Technology entitled, "Health Impacts of Radiofrequency from Smart Meters." Dr. Carpenter asserts and has testified that **"there is conclusive evidence for adverse health effects in humans."**
2. **Exhibit 2 of 4:** (11 pages) Daniel Hirsch, University of California, SC, Lecturer, Director of Program on Environmental and Nuclear Policy, on the same faulty report by the California Council on Science and Technology, which was based on estimates from the Electric Power Research Institute (EPRI), an industry group. His analysis shows that **the whole body exposure from a Smart Meter is actually orders of magnitude higher than that of a cellphone**, rather than orders of magnitude lower as is routinely claimed.
3. **Exhibit 3 of 4:** (14 pages) Karl Maret, M.D., BS in EE, MS in BE, President of Dove Health Alliance, a non-profit foundation specializing in the area of Energy Medicine, also asserts that this same CCST report used by many as evidence to validate the safety of Smart Meters contains inaccuracies and minimizes the biological effects and health impacts of non-thermal radiofrequency radiation, such as those produced by wireless technologies including Smart Meters

Copies of these three reports have been included with this response.

1 (d). But, the fact that a SK9AIM7 OpenWay Smart Meter has not been installed on our junction box, does not mean that we are not currently being exposed to harmful Smart Meter RF radiation. All of the other units in our 6 unit condominium building, and the other residences in the neighborhood have had their meters replaced with the SK9AIM7 OpenWay Smart Meter. The condominium buildings are composed of

six (6) condominium units that are connected in a horizontal side-by-side pattern. So, there are many Smart Meters now around us, pulse radiating throughout our indoor and outdoor living environments. I have already begun to notice an increased persistent ringing in my ears, which is one of the many symptoms that have been documented. The installation of a SK9AMI7 OpenWay Smart Meter on our junction box would only make matters worse, and add to the RF radiation already propagating throughout the neighborhood and the connected units in our condominium building, because of its close proximity to our areas of activity both inside and outside. Our junction box is located on the front of the property where the living room is located, and is right next to the bench we use when sitting on the porch.

1 (e). **We are elderly. Thus, we are in one of the primary target groups that have been shown to be particularly vulnerable and susceptible to the harmful effects caused by the frequent pulsed radiation emitted by this type of grid, and these type of devices. Smart Meters have been shown to increase the likelihood of cancer and other ailments. Furthermore, we have a number of chronic conditions, specifically with regard to musculoskeletal and gastrointestinal issues, that have been shown to be aggravated by these type of frequent pulsed radiation emissions.** Reference: **(Exhibit 4 of 4:** (3 pages) "American Academy of Environmental Medicine Recommendations Regarding Electromagnetic and Radiofrequency Exposure". A copy of this report has been supplied with this response.)

1 (f). Supporting Evidence (Exhibits) was supplied with our Formal Complaint, and more has been supplied with this response, to substantiate the fact that there is a credible threat of harm, and that this represents a matter that is in the public interest. It cannot routinely be ignored or dismissed "out of hand" simply for the sake of convenience because of some ill chosen words written on a piece of paper. The universally accepted health principle that "an ounce of prevention is worth a pound of

cure" is not without its merit in this situation, and should be afforded due and full consideration here.

1 (g). Furthermore, even if the voluntary opt-in provision § 2807 (f) (2) (i) was not explicitly stated in Act 129, but note that it is, we do not concede that Smart Meter programs like Duquesne Light's are mandatory, without exception.

First, there is no Federal mandate for Smart Meters, according to George W. Arnold the national coordinator for Smart Grid interoperability at the National Institute of Standards and Technology. There is no Federal law mandating that the general public, or individual consumers, must join a Smart Grid program. The only requirement is that the consumer must be offered a Smart Meter which they can choose to accept or refuse. Or, the consumer can request a Smart Meter and volunteer to opt-in to the Smart Grid. As such, Duquesne Light must ask our permission to install a Smart Meter, and may not install a Smart Meter without our permission, per the Federal law. Furthermore, there are legal protections that no one can be forced to comply with an unrevealed contract between private corporations, to which they were never a party and had no knowledge of.

Second, the Public Utilities Commission, under its public safety mandate as defined in the Pennsylvania Public Utility Code, has the authority to grant waivers for individuals, or classes of individuals, facing potential risk or harm.

2. DLC Counsel's statement: Preliminary objections may be filed for "legal insufficiency of a pleading." 52 Pa Code § 5.101(a)(4). "In order to be legally sufficient, a complaint must set forth an act or thing done or omitted to be done or about to be done or omitted to be done by the respondent in violation, or claimed violation, of a statute which the Commission has jurisdiction to administer, or of a regulation or order of the Commission." Drake v. Pennsylvania Electric Co., Docket No.C-2014-241 3771, 2014 WL 2003281 at *1 (Pa. P.U.C. May 7, 2014) (Salapa, AU).

Complainants (Our) Response:

2 (a). Section 1501 of the Public Utility Code states the following:

§ 1501. Character of service and facilities. Every public utility shall furnish and maintain **adequate, efficient, safe, and reasonable service and facilities**, and shall make all such repairs, changes, alterations, substitutions, extensions, and improvements in or to such service and facilities as shall be necessary or proper **for the accommodation, convenience, and safety of its patrons**, employees, and the public. **(emphasis added)**

The Complainants (we) maintain that the installation of the SK9MIA7 OpenWay Smart Meter, in the Smart Grid intended by Duquesne Light, violates this provision of the Public Utility Code, as it is not adequate, efficient, safe, and reasonable, and it does not accommodate the age, circumstances, conditions, and preferences of its patrons. It is introducing a controversial and inadequately validated device, and technology, that has been shown in recent independent studies by respected scientists, engineers, doctors, associations, institutions, etc. to be a credible threat of harm.

2 (b). With regards to safety concerns for example, Federal law requires that all end devices and appliances powered off of the electrical grid must obtain Nationally Recognized Testing Laboratories (NRTL) certification. In the United States, Authorities Having Jurisdiction (AHJs) assert that certification of electrical equipment is necessary and that Underwriters Laboratories is the preferred safety certification organization. These Smart Meter devices contain no UL Mark by Underwriters Laboratories, which does safety testing under the auspices of such agencies as OSHA. The UL Mark is the single most accepted Certification Mark in the United States, appearing on 22 billion products annually. Yet, no UL Mark appears on these Smart Meters. Underwriters Laboratories exists to "promote safe living and working environments". Its sole purpose is "to support the production and use of products which are physically and

environmentally safe.” (<http://www.ul.com/aboutul/our-mission/>)

In addition to lacking any UL Certification, these Smart Digital Meters are missing adequate Surge Arrestors to protect consumer-side electrical circuitry from utility-side voltage surges. They provide no Circuit Breaker Protection and are not designed to protect a homeowner’s electrical circuitry. Also, they contain Flammable Materials and electronic components that are susceptible to overheating and explosion. And, they contain nothing to warn the homeowner of overheating, fire danger, or explosion.

1000s of fires have been documented in PA, CA, TX, FL, NV, IL, and across Canada. Property has been damaged, and there have been fatalities. Overheating has been found to be a major issue. Causes have been traced to the nature and quality of the Smart Meter design and construction, the quality of the installation, and the condition of the wiring in the residence, which is not even evaluated before installation.

2 (c). Precedents: On October 7, 2016, as one example, the Honorable ALC Jeffrey A Watson ruled that the Preliminary Objections and Answer and New Matter of Duquesne Light Company, in Norbert Sliwinski v Duquesne Light Company, C-2016-2559985, in which Duquesne Light Company similarly averred that his Formal Complaint (which is not materially different than ours) was similarly legally insufficient, were denied, citing that it was in the public interest to address the material questions of fact that were raised.

Some of the other precedents in this regard in which EDC Preliminary Objections and Answer and New Matters were denied are:
Thomas and Margery McCarey vs PECO Energy Company, Docket No. C-2013-2354862
Laura Sunstein Murphy v PECO Energy Company, Docket No. C-2015-2475726.
Susan Kreider v. PECO Energy Company, Docket No. C-2015-2469655

3. DLC Counsel's statement: Section 703(b) of the Public Utility Code allows the Commission to dismiss any complaint without a hearing if, in its opinion, a hearing is not necessarily in the public interest. 66 Pa. C.S § 703(b). See also, *CamDisi v. PECO Energy Co.*, Docket No. 2014-2434501, 2014 WL 4644282 at *1 (Pa. P.U.C. Sept. 3, 2014) (Salapa, AU) ("The provision at 52 Pa. Code § 5.101(a)(4) serves judicial economy by avoiding a hearing where no factual dispute exists.").

Complainants (Our) Response:

3. The Complainants (we) assert that a factual dispute does exist. And, the precedents cited in Complainants Response 2 (c) demonstrate that the Commission does recognize that this issue is in fact in the public interest.

4. DLC Counsel's statement: Even accepting as true all well-pleaded material facts and reasonable inferences, the Complaint does not raise a violation of the Public Utility Code, Commission Order or regulation, or any Commission-approved tariff. It is, therefore, legally insufficient.

Complainants (Our) Response:

4 (a). The DLC Counsel avers that even accepting as true all well-pleaded material facts and reasonable inferences by the Complainants (us), that it is irrelevant and immaterial. All we can do is ask, how can any material facts and reasonable inferences, such as those we have submitted in our Formal Complaint and as part of this response to the Preliminary Objections of the Respondent's Counsel , be considered as irrelevant and immaterial, especially when they concern the public well-being?

4 (b). In Complainants Response 2 (a)., the Complainants (we) assert that this is in violation of Section 1501 of the Public Utility Code, and, as such, does meet the criteria for being legally sufficient.

4 (c). Also, we maintain that, all other issues aside and at a minimum, the Public Utilities Commission, under its public safety mandate as defined in the Pennsylvania Public Utility Code, has the authority to grant waivers for individuals, or classes of individuals, facing potential risk or harm. And, we maintain that the PUC can choose to

revise and rewrite the PA Smart Meter Procurement and Installation Implementation Order, taking into consideration the latest developments and occurrences. We have submitted our Formal Complaint with the belief that the PA PUC will recognize that it is in the best interest of the general public, which it exists to serve, to do this.

5. DLC Counsel's statement: Governor Edward Rendell signed Act 129 of 2008 into law on October 15, 2008. The Act took effect on November 14, 2008, and amended Section 2807 of the Public Utility Code. Act 129 directed Duquesne Light and other EDCs to file smart meter procurement and installation plans with the Commission, which Duquesne Light did. On May 6, 2013, at Docket No. M-2009-2123948, the Commission approved Duquesne Light's smart meter procurement and installation plan. Thus, by planning to install a smart meter at Complainant's residence, Duquesne Light is *complying* with Pennsylvania law as well as the Commission's express directives, which renders the Formal Complaint legally insufficient. See Campisi, supra (granting preliminary objections for legal insufficiency where the complainant sought to opt out of PECO's smart meter program) (citing additional cases).

Complainants (Our) Response:

5 (a). Again, as stated in Complainants Response 1 (a)., PA Act 129, as signed by Governor Rendell, has as its first and foremost tenet, § 2807 (f) (2) (i), that EDCs shall furnish smart meter technology "upon request from a customer that agrees to pay the cost of the smart meter at the time of the request". This is a voluntary opt-in provision which explicitly states that **customers may choose to join the Smart Meter program if they so desire**. To reiterate, we have never requested to opt-in to this Smart Meter program. We have never requested a Smart Meter. And, we have never agreed to pay the cost of a Smart Meter.

5 (b). Duquesne Light, "by planning to install a smart meter at Complainant's residence" against the Complainant's (our) consent and stated objections is in direct violation of tenet § 2807 (f) (2) (i), of Act 129, and the expressed intent of the legislature as documented in Senate Journal Page 2626-2631, Oct. 8, 2008. Here, Senator Tomlinson, states with regard to House Bill No. 2200 as amended by the Senate, and subsequently signed by Governor Rendell as Act 129, that "It is not mandated, but it allows for ... anyone who wants to purchase a smart meter which they feel will help them

manage their electric load better." Here, Senator Boscola states, "We also made sure that smart meters would not be mandated for every single ratepayer. Not only is that a smarter approach to smart meter deployment, but it will also save electric customers hundreds of millions of dollars paying for something that will not provide a real benefit in their own households." And here, Senator Fumo states, "In addition, we did not mandate smart meters, but we made them optional." The Complainants (we) maintain that this provides sufficient grounds to establish that our Formal Complaint satisfies the criteria for legally sufficiency.

5 (c). DLC Counsel's reference to Campisi ..., is irrelevant and immaterial as we have never agreed to opt-in. And, again we refer to the precedents, cited in Complainants Response 2 (c)., of:

Norbert Sliwinski v Duquesne Light Company, C-2016-2559985,

Thomas and Margery McCarey vs PECO Energy Company,
Docket No. C-2013-2354862

Laura Sunstein Murphy v PECO Energy Company, Docket No. C-2015-2475726.

Susan Kreider v. PECO Energy Company, Docket No. C-2015-2469655

where the rote objection by the Respondent of "legal insufficiency" was denied because the Formal Complaints by these Complainants, which are not materially different from our own, were ruled to be in the public interest.

6. DLC Counsel's statement: Section 2807 of the Public Utility Code provides:

(f) Smart meter technology² and time of use rates.

(2) Electric distribution companies **shall** furnish smart meter technology as follows:

(i) Upon request from a customer that agrees to pay the cost of the smart meter at the time of the request.

(ii) In new building construction.

(iii) In accordance with a depreciation schedule not to exceed 15 years.

66 Pa. C.S. § 2807(f) (2) (*emphasis added*).

(² The Commission defines "smart meter technology" as "technology, including metering technology and network communications technology capable of bidirectional communication, that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology." 66 Pa. C.S. § 2807(g).)

Complainants (Our) Response:

6 (a). Again, as stated in Complainants Response 1 (a). and 5 (a)., PA Act 129, as signed by Governor Rendell, has as its first and foremost tenet, § 2807 (f) (2) (i), that EDCs shall furnish smart meter technology "upon request from a customer that agrees to pay the cost of the smart meter at the time of the request". This is a voluntary opt-in provision which explicitly states that **customers may choose to join the Smart Meter program if they so desire**. To reiterate, we have never requested to opt-in to this Smart Meter program. We have never requested a Smart Meter. And, we have never agreed to pay the cost of a Smart Meter.

And, as provided in Complainant Response 5 (b)., this was expressed intent of the legislature as documented in Senate Journal Page 2626-2631, Oct. 8, 2008. And, this is further substantiated by House Journal Page 386-403, Feb. 11, 2008 and House Journal Page 430-432, Feb. 12, 2008.

6 (b). Provisions § 2807 (f) (2) (ii) and (iii) are there to address cases not associated with or are beyond existing individual consumers. And, we aver that § 2807 (f) (2) (iii) does not override or supercede § 2807 (f) (2) (i), the first and foremost tenet, and § 2807 (f) (2) (ii), because if it did, then § 2807 (f) (2) (i) and (ii) would be meaningless, pointless, and irrelevant. The original Bill, Bill # PN 3218, associated with HB 2200, quite clearly stated, "(ii) Electric distribution companies shall furnish smart meter technology to:

(C) One hundred percent of its customers within ten years after the effective date of this

paragraph.” This would have implemented a definitive state mandate; but, it was resoundingly rejected by the General Assembly, and the legislation evolved into its final voluntary opt-in form which was signed by Governor Rendell.

6 (c). One may argue and disagree over the specific words that comprise § 2807 (f) (2) (iii); but, one cannot argue the intent and meaning of the legislature as summarized by Senator Fumo's recorded statement that, “we did not mandate smart meters, but we made them optional.” (Refer to Complainant's Response 5 (b)). Nor, can one contest that there is no Federal mandate for Smart Meters (Refer to Complainant's Response 1 (g)).

6 (d). We also submit the following additional comments concerning the specific words that comprise § 2807 (f) (2) (iii). Even though the Smart Meter is attached to the homeowner's residence, it is and remains the equipment and property of the EDCs, which are private corporations in business to make a profit. One aspect of their financial status is the expensing of capital assets and equipment through depreciation. Depreciation of an asset and the depreciation schedule for an asset has little to do with the actual service life of that equipment or asset. Equipment routinely continues to function and be used well beyond its “depreciated life.” An asset's “depreciable life” is an artificial construct that is assigned in the tax code, and it varies from asset to asset, property to property, and equipment type to equipment type.

So, what does this have to do with Smart Meters in PA? Act 129 was signed into law in 2008, and in it § 2807 (f) (2) (iii) mentions a depreciation schedule of 15 years. Yet, the service life, the life expectancy, of analog meters, such as the one currently on our residence has been demonstrated to have a normal field service life of from 30 - 40years. With a normal service life of 30 - 40 years, a reasonable expectation would be that our current analog meter would not have to be replaced until sometime

around the years 2026 to 2036.. That is a very long time in the future.

Even accepting as valid, which we do not (and we have already submitted valid reasons why we believe that this is not the case), that the wording of § 2807 (f) (2) (iii) specifies a mandatory universal 15 year deployment deadline starting from the enactment of the law in 2008, our current meter would not have to be replaced until the year 2023. This is still many years in the future. It is nowhere near 2023. Our current meter does not need to be replaced at this time as it is functioning normally, and will continue to do so for many years to come. And, we have not requested that our meter be replaced with a Smart Meter. We have not requested to opt-in to the Smart Meter program. So, until the year 2023 occurs, it cannot be claimed that we are in any way in violation of any aspect of Act 129, no matter how you interpret it.

There is no public demand for this device, and there is no overriding need that validates that it is in the public interest to accelerate the deployment of these Smart Meters as Duquesne Light apparently wants to do. In fact, there is increasing resistance and objections as more people become aware of the true risks and hazards associated with this controversial technology. What truly needs to be done and what would truly be in the best interest of the general public is modernizing the electrical distribution infrastructure, rather than trying to force this hazardous, invasive, and unwelcome end-metering technology on ill-informed homeowners. Again, as stated earlier there is no Federal mandate for this and it is contrary to the intent of the legislature. And, we add that there is no other state in the union that we are aware of that has passed legislation imposing a mandatory universal Smart Meter deployment on its residents. Even former Director of the CIA, James Woolsey, has gone on public record stating that this is a bad idea.

7. DLC Counsel's statement: *The Commission has ruled that "[the use of the word 'shall' in the statutes indicates the General Assembly's direction that all customers will receive a smart meter." Evans v. PECO Energy Co., Docket No. C-2013-2368477, 2013 WL 7019103 at *3 (Pa. P.U.C. Dec. 19, 2013) (Hoyer, AU) (emphasis added). Likewise, the Commission Implementation Order relating to the installation of smart meters provides: "The Commission believes that it was the intent of the General Assembly to require all covered EDCs to deploy smart meters system-wide when it included a requirement for smart meter deployment 'in accordance with a depreciation schedule not to exceed 15 years.'" Id. (quoting Smart Meter Procurement and Installation Implementation Order, Docket No. M-2009-2092655 (entered June 24, 2009)) (emphasis added).*

Complainants (Our) Response:

7. We aver that this has been addressed and argued in Complainants Responses 6 (a) through 6 (d).

8. DLC Counsel's statement: Simply put, "there is no provision in the statute that allows customers to 'opt out' of smart meter installation, as Complainants desire." Evans, 2013 WL 7019103 at *3 See also, Francis v. PECO Energy Co., Docket No. C-2014-2451 351, 2015 WL 5011620 at *7 (Pa. P.U.C. August 20, 2015) (noting that "there is no provision in the Code, the Commission's Regulations, or Commission Orders that permits a customer to opt out of having a smart meter installed on his or her premises."); Povacz v. PECO Energy Co., Docket NO. C-2012-2317176, 2013 WL 392699 (Pa. P.U.C. Jan. 24, 2013).

Complainants (Our) Response:

8. This statement references a number of prior cases related to "opt-out". We aver that this statement has been addressed and argued in Complainants Responses 1 (a), 1 (g), 2 (a), 4 (c), 5 (a) - 5 (c), 6 (a) - 6 (d) The rote reference to us requesting an opt-out of a program that we never agreed to opt-into is a misrepresentation of the facts of the situation.

9. DLC Counsel's statement: In light of the foregoing precedent, the Commission routinely dismisses as legally insufficient cases like the instant one filed by customers who oppose the installation of smart meters. See, Campisi, supra (collecting cases); Evans, supra.

Complainants (Our) Response:

9. This statement again refers to "legal insufficiency", which was already brought up in DLC Counsel's statement 2. We aver that this has been addressed and argued in Complainants Responses 2 (a) - 2 (c), in which cases materially similar to ours were listed, where the Commission ruled that they met the Commission's criteria for

being legally sufficient. The Commission ruled that the rote objections and answers by the EDCs were denied, that the Formal Complaints were legally sufficient, and that they represented a matter that was in the public interest.

10. DLC Counsel's statement: For example, in Evans, supra, the complainants wanted to opt out of PECO's smart meter program "because they believe smart meters are not safe and could potentially cause a fire." Id. at *1. Relying on the mandatory language of Section 2807, ALJ Hoyer ruled: Whereas the statute provides that PECO 'shall' install these meters and there is no provision in the statute or the Commission's Implementation Order that allows a customer to opt out of the smart meter installation, coupled with the ability of the Commission to dismiss a complaint without a hearing if it is in the public interest, I find that Complainants in this case are unable to demonstrate that PECO has violated the Public Utility Code, any Commission Order or regulation, or any Commission-approved tariff. The complaint here is legally insufficient and must be dismissed.
Id. at *3

Complainants (Our) Response:

10. This statement again refers to Evans supra and "opt-out", which was already mentioned in DLC Counsel's statements 8 and 9. As with DLC Counsel's statement 8., we again aver that this statement has been addressed and argued in Complainants Responses 1 (a), 1 (g), 2 (a), 2 (c), 4 (c), 5 (a) - 5 (c), 6 (a) - 6 (d) The continued rote reference to us requesting an opt-out of a program that we never agreed to opt-into is a misrepresentation of the facts of the situation.

11. DLC Counsel's statement: Similarly in Campisi, supra, ALJ Salapa granted PECO's preliminary objections and dismissed as legally insufficient a formal complaint filed by a customer who did not want a smart meter installed at her residence. In pertinent part, ALJ Salapa noted: "The Commission has continued to uphold smart meter installation and charges and dismiss complaints opposing smart meter installation and charges on the basis of legal insufficiency." Id. The ruling further provides:

Because Act 129 of 2008 and the Commission's orders authorize the Respondent to develop and implement a smart meter procurement and installation plan, and impose a smart meter charge on its customers to pay for that development, implementation, procurement and installation and do not allow a customer to opt out of having a smart meter installed, the Complainant has not **(the text of the objection stops at this point)**

Complainants (Our) Response:

11 (a). This objection apparently continues onto page 5, which is missing. We

cannot comment on this objection without being able to read it in its entirety.

11 (b). However, in the context of where it raises the issue of legal insufficiency, the Complainants again refer to the precedents, cited in Complainants Response 2 (c),

of: Norbert Sliwinski v Duquesne Light Company, C-2016-2559985,

Thomas and Margery McCarey vs PECO Energy Company,
Docket No. C-2013-2354862

Laura Sunstein Murphy v PECO Energy Company, Docket No. C-2015-2475726.

Susan Kreider v. PECO Energy Company, Docket No. C-2015-2469655

where the rote objection by the Respondent of "legal insufficiency" was denied because the Formal Complaints by these Complainants, which are not materially different from our own, were ruled to be in the public interest.

- 12., 13. DLC Counsel's statements: (12. Is missing and 13. is incomplete in the filed document).

Complainants (Our) Response:

12., 13. These objections apparently appear on page 5, which is missing. As with objection 11., we cannot comment on these objections without being able to read them in their entirety.

14. DLC Counsel's statement: Since Duquesne Lights installation of smart meters is consistent with, and not a violation of, the Code and Commission regulations and orders, the Formal Complaint is legally insufficient and must be dismissed in accordance with Commission precedent.

Complainants (Our) Response:

14. This is the last Preliminary Objection provided by DLC's Counsel. The Complainants (we) aver that we have made the case for legal sufficiency, and that Duquesne Lights installation of smart meters is in conflict with Section 1501 of the Public Utility Code as discussed in Complainants Responses 2 (a) - 2 (c). And, we aver according to prior Commission rulings and precedents set in

Norbert Sliwinski v Duquesne Light Company, C-2016-2559985,

Thomas and Margery McCarey vs PECO Energy Company,
Docket No. C-2013-2354862

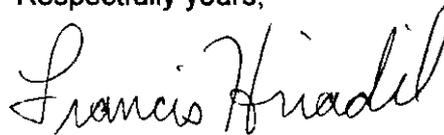
Laura Sunstein Murphy v PECO Energy Company, Docket No. C-2015-2475726.

Susan Kreider v. PECO Energy Company, Docket No. C-2015-2469655

that the Preliminary Objections submitted by DLC's Counsel must be denied because it is a matter that is in the public interest.

WHEREFORE, Complainants Michele Hriadil and Francis Hriadil respectfully request that the Commission deny Duquesne Light Company's Preliminary Objections, as has occurred in other similar complaints before the Commission. Even though Duquesne Light's Preliminary Objections document was incomplete, we have addressed each of their objections in turn on the pages that we did receive, and believe that we have provided sufficient evidence that this is a matter of public interest and that Duquesne Light has no basis to ask for our complaint to be dismissed.

Respectfully yours,



Francis Hriadil
(412) 779-3314
331 Shady Ridge Drive
Monroeville, PA 15146

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

**Complainants Response to
PRELIMINARY OBJECTIONS TO
FORMAL COMPLAINT**

Filed by Michele and Francis Hriadil

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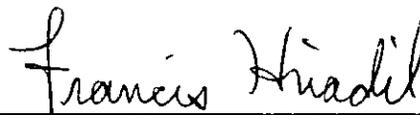
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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

**4 EXHIBITS SUPPLIED WITH COMPLAINANTS RESPONSE to PRELIMINARY OBJECTIONS
TO FORMAL COMPLAINT**

TO: RESPONDENT'S GENERAL COUNSEL, JEREMY V FARRELL, ESQUIRE, AND LAUREN N
RULLI, ESQUIRE .

ATTACHED ARE THE 4 EXHIBITS REFERENCED IN OUR WRITTEN RESPONSE TO THE
TO THE PRELIMINARY OBJECTIONS OF RESPONDENT DUQUESNE LIGHT COMPANY. IT
HAS BEEN SUBMITTED ALONG WITH OUR WRITTEN RESPONSE TO YOU PER THE AGREED
UPON DEADLINE OF DECEMBER 1, 2016.



Francis Hriadil
November 29, 2016



This is a report on the review of the California Council on Science and Technology document, "Health Impacts of Radiofrequency from Smart Meters". I am a public health physician and former Dean of the School of Public Health at the University at Albany. I have been involved in review and analysis of studies on electromagnetic fields, including radiofrequency fields, for many years. I served as the Executive Secretary to the New York State Powerlines Project in the 1980s, and have published several reviews on the subject and have edited two books. In addition I was invited to present to the recent President's Cancer Panel on the subject of powerline and radiofrequency fields and cancer.

This document is not an accurate description of the state of the science on the issue of radiofrequency fields, and is full of inaccuracies. My specific concerns are as follows:

1. The benefit of the smart meters is entirely to the utilities, and is economic in nature. If they install smart meters they can fire those individuals who at present are employed to go around reading meters. Thus this is a job-killing proposal, and will increase unemployment in a state that already has too much.
2. When a smart meter is installed residents have no choice in the matter nor ability to avoid exposure. But every individual has the option to use or not use other personal wireless devices, until more is known about health consequences of chronic RF exposure. There is a major difference between an exposure which an individual chooses to accept and one that is forced on individuals who can do nothing about it.
3. The statement "The potential for behavioral disruption from increase body tissue temperatures is the only biological health impact that has been consistently demonstrated and scientifically proven to result from absorbing RF within the band of the electromagnetic spectrum that smart meters use" is totally wrong. In the first place there are many adverse health effects other than "behavioral disruption" demonstrated as a result of tissue heating. The evidence for increased risk of brain tumors, acoustic neuromas and parotid gland tumors in individuals who have used a cell phone for 10 years or more is consistent, and the tumors occur predominantly on the side of the head where the phone is used. There is also strong and consistent evidence for increased risk of leukemia in individuals who live near to high power AM radio transmission towers, even though this report characterizes such exposures as being "quite low" and show in Figure 7 that they are lower than the RF fields from smart meters.
4. The statement "The scientific consensus is that body temperatures must increase at least 1°C to lead to potential biological impacts from the heat" is totally wrong, and makes it obvious that no persons with medical or biological expertise participated in this report. Every enzyme system in the body is exquisitely sensitive to temperature, and increases activity by even a fraction of a degree increase in temperature. In fact all RF generates heat, and what is defined as "non-thermal" is only a function of our ability to measure the temperature increase.
5. The statement "While concerns of brain cancer associated with mobile phone usage persist, there is currently no definitive evidence linking cell phone usage with increased incidence of cancer" is incorrect. The evidence is strong and consistent among studies looking at long-term and intensive use of cell phones. The AM radio studies mentioned above are also relevant, particularly because like smart phones radio transmission towers give whole body radiation, not just to the head.
6. The statement "There currently is no conclusive scientific evidence pointing to a non-thermal cause-and-effect between human exposure to RF emissions and negative health impacts is

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and
Department of Environmental Health Sciences
School of Public Health

- inaccurate, and depends totally on what one defines as conclusive". In biology and medicine there is nothing that is 100% proven. We rely on statistical significance and weight of evidence when drawing conclusions about health effects. When one uses these definitions there is conclusive scientific evidence for adverse health effects in humans.
7. The evidence for adverse effects of radiofrequency radiation is currently strong and grows stronger with each new study. Wired meters with shielded cable do not increase exposure. The report clearly indicates that "smart meters could conceivably be adapted to non-wireless transmission of data. However, retrofitting millions of smart meters with hard-wired technology could be difficult and costly." Clearly the answer to this dilemma is not to install wireless smart meters to begin with.

Thank you for the opportunity to comment on this faulty report, and on the general issue of smart meters. Their use is unwise from both a public health point of view, which is where my expertise lies, but and also from a purely short and long-term economic point of view.

Yours sincerely,

A handwritten signature in cursive script that reads "David O. Carpenter".

David O. Carpenter, M.D.
Director, Institute for Health and the Environment
University at Albany

Comments on the Draft Report
by the California Council on Science and Technology
“Health Impacts of Radio Frequency from Smart Meters”

by Daniel Hirsch¹
31 January 2011

Abstract

The draft report by the California Council on Science and Technology (CCST) does not appear to answer the questions asked of it by the requesting elected officials. Furthermore, rather than being an independent, science-based study, the CCST largely cuts and pastes estimates from a brochure by the Electric Power Research Institute, an industry group, issued some weeks earlier. The EPRI estimates appear incorrect in a number of regards. When two of the most central errors are corrected – the failure to take into account duty cycles of cell phones and microwave ovens and the failure to utilize the same units (they should compare everything in terms of average whole body exposure) **the cumulative whole body exposure from a Smart Meter at 3 feet appears to be approximately two orders of magnitude higher than that of a cell phone, rather than two orders of magnitude lower.**

It is strongly recommended that CCST revise its Draft Report and conduct actual measurements of cell phone, microwave oven, and SmartMeter RF cumulative whole body power densities. If measurements aren't made, then rigorous calculations correcting for cell phone and microwave oven duty cycles and whole body exposures should be made.

A summary figure below shows how rough estimates of the effect of those corrections suggest SmartMeters may produce cumulative whole body exposures far higher than that of cell phones or microwave ovens.

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¹ The assistance of two UCSC student research assistants, Bailey Hall and Catherine Wahlgren, in the preparation of this review is gratefully acknowledged.

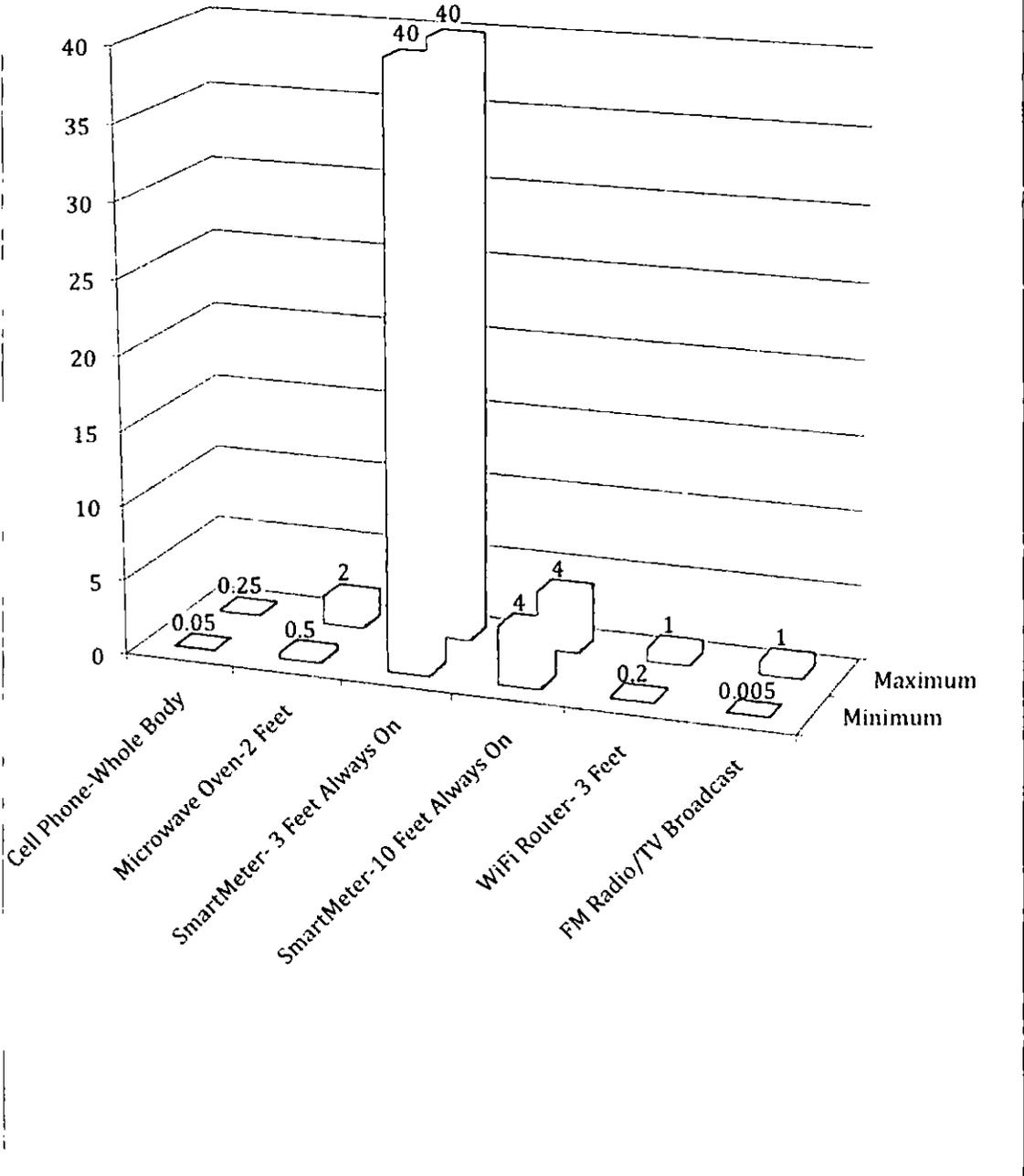


Figure A. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected for assumed duty cycle and whole body exposure extrapolated from assumed cell phone dose at ear].

On 30 July 2010 Assemblymember Jared Huffman requested that CCST undertake an “independent, science-based study” of two questions: “whether FCC standards for SmartMeters are sufficiently protective of public health taking into account current exposure levels to radiofrequency and electromagnetic fields, and further to assess whether additional technology specific standards are needed for SmartMeters and other devices that are commonly found in and around homes, to ensure adequate protection from adverse health effects.”

Unfortunately, the Council draft report answers neither question.

In September, Assemblymember William Monning and Mill Valley Mayor Stephanie Moulton-Peters joined in the request, asking in particular that CCST review the central issue associated with the current FCC standards, which are decades old and based solely on protecting against prompt thermal effects (heating of tissue)—that they fail to take into consideration long-term and cumulative exposures to these devices and potential non-thermal health impacts (e.g., latent cancers).

Again, the Council’s draft report provides little if any useful information or analysis of this matter. There is no mention or analysis of the specific studies that have suggested, for example, a cancer effect from RF exposure such as the large, international study funded by the cell phone industry, the Interphone study, that found a significant increase in brain cancers in people who used cell phones half an hour a day for ten years. Given the long latency period generally for solid cancers, such a finding gives pause as to what might be seen over the long term. Some other studies have suggested an increased risk of brain cancer on the side of the head where the cellphone is normally used. Other studies, however, have not found an effect. Given the nature of the request from the elected officials for a review of this critical scientific issue—whether there is the potential for non-thermal health effects from cumulative, long-term exposure to RF radiation—one would have hoped that there would have been a more detailed analysis of this question in the report.

The report is candid, however, that at present the issue is unresolved. But it goes on to then say there is no basis for changing the FCC standards which are based only on prompt, thermal effects. One could equally well say there is no basis for maintaining the FCC standards, given the uncertainties about latent, non-thermal effects.

What the CCST draft report does focus on, however, is the relative exposure from SmartMeters compared to other RF-emitting devices in common use. Here, again, the draft report disappoints. The elected officials cited claims made by the electric utility industry regarding safety of SmartMeters and purportedly relative low exposures compared to other common devices and requested “an independent, science-based study.”

However, the CCST draft report does not appear to include much if any independent work on the subject but rather merely pastes in a table taken from an 8-page pamphlet released a few weeks earlier by the Electric Power Research Institute (EPRI), an advocacy group for the

electric power industry.² This EPRI table and the graph made from it constitute the core of the CCST report, and is reproduced here as Figure 1.

The EPRI pamphlet is not a peer-reviewed scientific study. It is a brief item for an advocacy group that is supported by industry. If the elected officials wanted the industry's views, it would have asked for them. Instead, it wished an independent, science-based study by an entity without the kinds of conflicts of interest EPRI has on this matter. But the CCST draft report is basically simply a cut-and-paste job from the EPRI brochure.

Note also that the estimate for exposure from a single SmartMeter contained in the EPRI item and repeated in the CCST draft is not a measured value but estimated—how is not made clear. EPRI's measurements were for a bank of ten SmartMeters; it didn't measure one alone but somehow estimated for it, despite the difference in how exposure falls off from one versus ten. The latter is inverse of the distance, the former inverse square of the distance. One presumes the electeds wanted actual measured values from an independent source, not a calculated value from the electric industry, without even an explanation of how it is was calculated and without independent verification.

CCST does correct one error made in the EPRI brochure whereby it reduced the presumed power density estimates for the SmartMeter by duty cycles of 1 and 5%. CCST rightly indicated that future duty cycles could be much higher as "new applications and functionality are added to the meter's communication module in the future." For this reason, it assumed a 100% duty cycle in its calculations.

HOWEVER, CCST did not correct numerous other apparent errors from the EPRI brochure when it adopted EPRI's values. For example, for cell phone exposures, CCST did not correct for the presumed duty cycle of the cell phone (which CCST indicates on average is 1%). Nor did it convert the EPRI cell phone power density estimate into comparable units. EPRI (and thus CCST) compared a *whole body average* exposure to SmartMeter radiation to *peak exposure to the ear* for the cell phone. One needs to compare apples and apples, or whole body exposures to whole body exposures. Comparing the peak dose to the ear from a cell phone, when the rest of the body gets vastly less radiation, with a whole body exposure where all organs get roughly the same dose from a SmartMeter, doesn't seem appropriate. If there is a cancer effect, it is likely associated with the total RF energy the body receives.

Similar apparent errors were made in the comparison to microwave ovens. Again, the duty cycle of the microwave oven is ignored. It is used perhaps fifteen minutes a day, and it is unlikely people are 2 feet away from the device for the full time it is on. Its "down time" must be included if one is looking, as requested by the elected officials, at potential cumulative, long-term exposures.

² The EPRI brochure was apparently released on November 17, providing little if any time for serious review of it by CCST prior to the release a few weeks later (with the holidays intervening) of the CCST report on which it was based.

[Additionally, the values given for microwave oven exposures by EPRI and adopted without changed in the CCST draft report seem questionable. Three references are given in the EPRI report, although for which claim each applies is not made clear. The first reference, the ICNIRP report, does not in fact give measured values for microwave ovens, but instead reports what the legal limit for leakage is, generally reported to be orders of magnitude above what typical exposures from microwave ovens really are. The second reference is to a 1978 paper by PG&E's consultant, RA Tell. That paper CCST has not made available for review, but it is over three decades old, and thus of little relevance to today's microwave ovens. The third reference is merely to a personal communication with Tell, without any information as to the content of that communication. When one checks the values reported by EPRI and uncritically adopted by CCST, it appears that the first value, 5 mW/cm^2 at 2 inches from the device, is in fact not a measured value of typical exposures but the vastly higher legal limit for leakage. The literature in fact indicates that 50% of microwave ovens produce less than 0.062 mW/cm^2 at 5 cm, or two orders of magnitude below the value reported by EPRI and reproduced by CCST without question. See, e.g., R, Mathes, "Radiation Emission from Microwave Ovens," *Journal of Radiation Protection*, Vol. 12, No. 3, September 1992. One presumes the leakage rate has been reduced even further since then.]

One recognizes that if one is comparing to FCC existing standards based solely on acute, thermal effects that duty cycle might be treated differently. But if there is a cancer effect, which is what the electeds asked CCST to study, a likely key aspect of the dose-response relationship is the cumulative whole body dose. For ionizing radiation, about which I have spent much of my career, the determining factor is largely how much radiation energy the body has absorbed. [There are of course other factors, such as the relative biological effectiveness (RBE) of different types of ionizing radiation and varying sensitivity of different organs.] So, if the question were how does SmartMeter and cell phone RF radiation compare to FCC limits, duty cycle may be treated in a different fashion. But since the question is what if FCC limits, based solely on thermal effects, may be inadequate to protect against cancer and other non-thermal effects, then the duty cycle—which determines the cumulative total exposure received—and whole body exposure must be factored in. My fundamental recommendation is that the draft report should be revised to correct for these two factors.

I have taken the liberty, with the help of two student assistants, to demonstrate the potential impact of some of these corrections.

Figure 1 is simply the CCST Figure 1, which in turn was largely taken from the estimates in the EPRI pamphlet. Units were simply converted by CCST from mW/cm^2 to $\mu\text{W/cm}^2$ and it corrected the duty cycle for the SmartMeter, otherwise the data are unchanged from EPRI's estimates. One will note that the estimated exposure from the cell phone is just to the ear, in direct contact with the cell phone, whereas the other comparisons, including the SmartMeter, are for whole body exposures, and that the duty cycle of the cell phone and microwave oven were not corrected. In other words, the chart compares a SmartMeter that is always on with a cell phone or microwave oven when they are being used, even though 99% of the time they are not in use. This overestimates the cumulative exposure by a factor of 100 for the cell phone and microwave oven, and dramatically skews the comparison.

Figure 2 fixes the error regarding duty cycle for the cell phone and microwave oven, markedly altering the comparison. The minimum cumulative exposure over time from the SmartMeter at 3 feet is 80 times the minimum cumulative exposure from the microwave oven and four times the minimum cumulative exposure from the cell phone, for example. This does not involve any correction of the while-on exposure values for either the cell phone or microwave oven, only the duty cycle factor.

Figure 3 provides a very rough approximation of the correction of the cell phone at the ear estimate to a whole body estimate so it is comparable to the whole body estimate for the SmartMeter. *It should be stressed that neither this estimate nor that in Figure 4 using a different approach is intended to be a definitive figure, but is intended to be exemplary of the kind of change to the comparison a detailed analysis may produce. It is my recommendation that CCST carefully measure, or at minimum thoroughly calculate, the average power density over the whole body from a cell phone held at the ear. We here have made two very rough estimates just to make the point what a far more detailed analysis may show.*

The value used for the peak cell phone power density for a cell phone held to the ear in the CCST draft report is taken directly from the EPRI pamphlet, without apparent independent review or correction. According to p. 6 of the EPRI pamphlet, the value it gives apparently is not a measured value but an estimate. How the estimate was arrived at is not detailed in the brochure. All that is said is in footnote 1, "Based on a 3-inch 250mW antenna emitting in a cylindrical wavefront." A quick calculation to try to reproduce what EPRI must have done indicates that if it merely assumed that all of the energy from a 250mW cell phone was transmitted by holding directly against the ear into a circular area with a 3 inch diameter, the power density in that small circular area around the ear would be 5 mW/cm^2 . That is precisely the upper value given by EPRI in its table. We don't know if that is what EPRI did, since it doesn't tell us what it did and CCST does not appear to have tried to confirm the asserted value. But in any case, 5 mW/cm^2 from a 250mW cell phone would indeed appear to require that that power be deposited solely in that very small circular area.

Averaging over the full potentially exposed surface area of the body (presuming only half the body surface could be exposed to the cell phone from any one angle), the whole body exposure would be approximately on average 0.25 mW/cm^2 given the maximum value to the ear of 5 mW/cm^2 put forward by EPRI and the CCST draft report and correcting as well for the duty cycle. **The SmartMeter thus would produce 160 times more cumulative whole body exposure than the cell phone assuming this estimate for whole body exposure.** This is shown in Figure 3.³

³ In these graphs we have used the values for a microwave oven at 2 feet put forward by EPRI and repeated by CCST even though, as discussed above, they appear questionably high. Note that measured values indicate typical measured microwave oven RF fields 5 cm from the oven are in the range of 0.062 mW/cm^2 , whereas the EPRI estimates used by CCST are for comparable values 2 feet away, which, if the exposure were drop by inverse square of the distance, should be very much lower. It is unclear whether EPRI is actually referring to measured values or to the legal limits, the latter being irrelevant in this context.

Since the EPRI estimate for cell phone peak power density at the ear is unexplained as to its derivation, we have also made a very rough estimate of whole body exposure from a cell phone from an independent line of calculation. Taking the values EPRI (and thereby CCST) put forward for exposure at three feet from a 250 mW SmartMeter, and noting that EPRI assumed the cell phone would also be 250mW, one can make a rough estimate of power density for the whole body from a cell phone held at the head. The exposure at one's waist would be approximately three feet from the source, just as in the assumed case of the SmartMeter. Presuming that the dose falls off as the inverse square of the distance, a very rough estimate of power density averaged over half the surface of the whole body, and taking into account duty cycle, yields a cumulative cell phone whole body power density of roughly $0.75 \mu\text{W}/\text{cm}^2$. **Using this way of estimating suggests the SmartMeter would produce 50 times the cumulative whole body exposure as a cell phone.** The results of this comparison are found in Figure 4.

We are here using the duty cycles proposed by CCST itself in its draft report. We recognize other duty cycles can be considered. Perhaps one should presume maximum duty cycle in the future for SmartMeters, when all additional features are incorporated, might be only 50%, for example. But other factors also need to be considered, including exposures from banks of SmartMeters attached to an apartment building, and the exposure from all the devices within a home that are planned to be constantly communicating by RF with the SmartMeter.⁴

It is strongly recommended that CCST revise the report and perform actual measurements. At minimum, revised calculations that correct for duty cycle and cumulative whole body exposure should be conducted.

⁴ It is noted that EPRI claims a diminished dose in back of a bank of SmartMeters, but it is unclear that that claim can be relied upon. The particulars of the specific test done by EPRI, in connection with the manufacturer of the devices (who has an obvious interest in findings suggesting safety), are not spelled out. Furthermore, it is unclear how the SmartMeter can communicate with devices inside the home—the key purpose—if the back of the device blocks most of the signal from getting through.

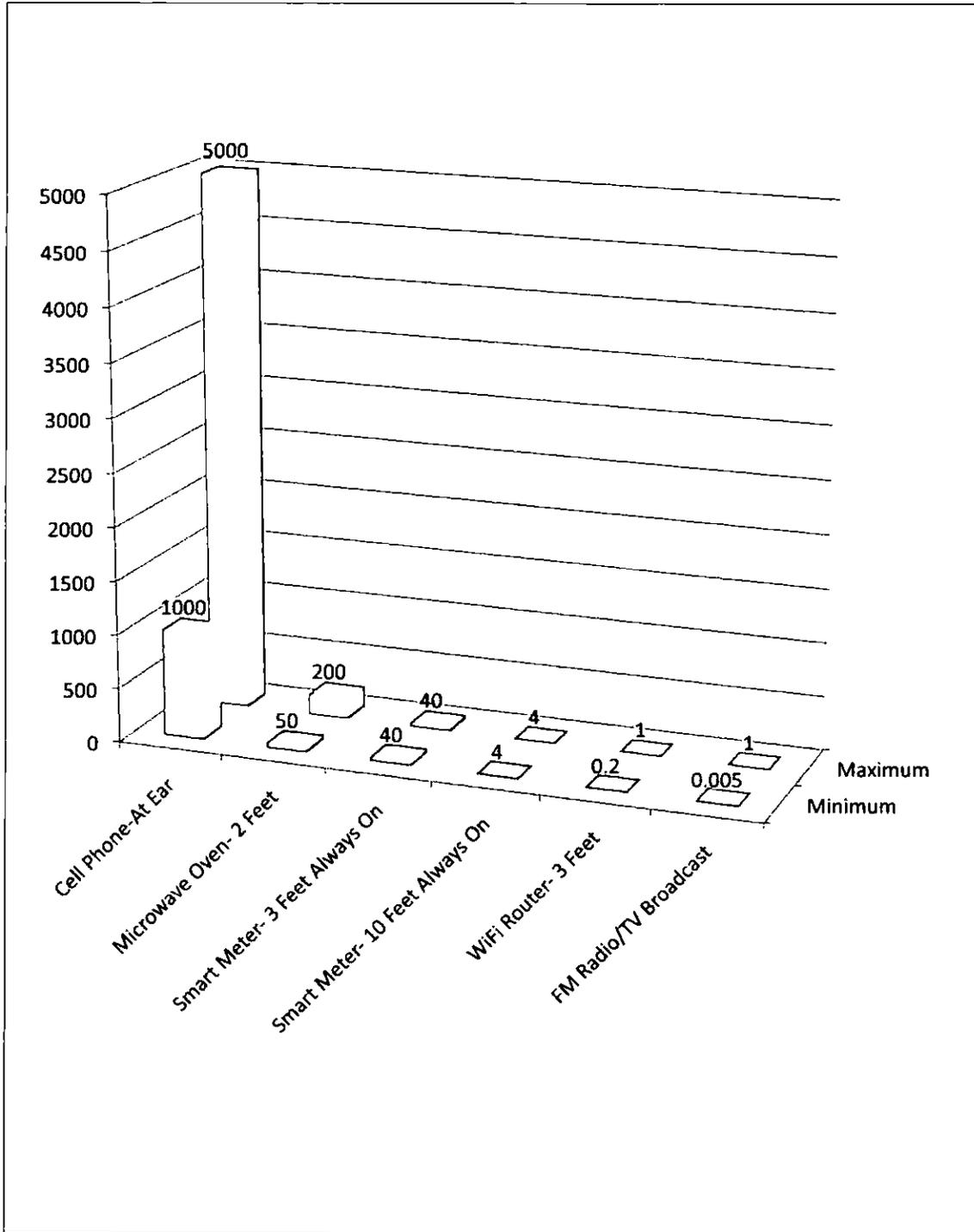


Figure 1: Graph from CCST Report in $\mu\text{W}/\text{cm}^2$ —uncorrected for whole body exposure or duty cycle

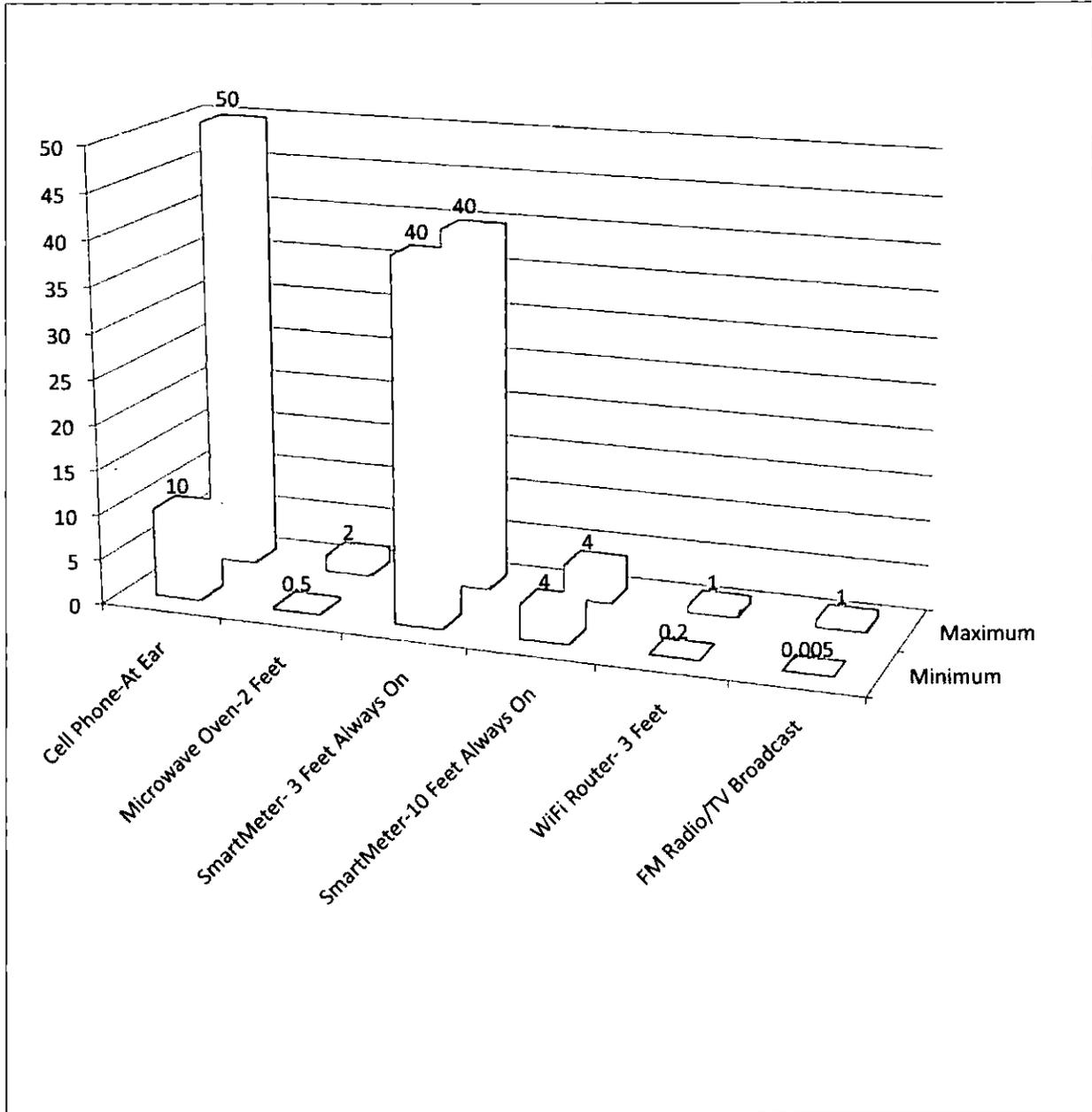


Figure 2. Comparison of Radio-Frequency Levels from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected only for assumed duty cycle].

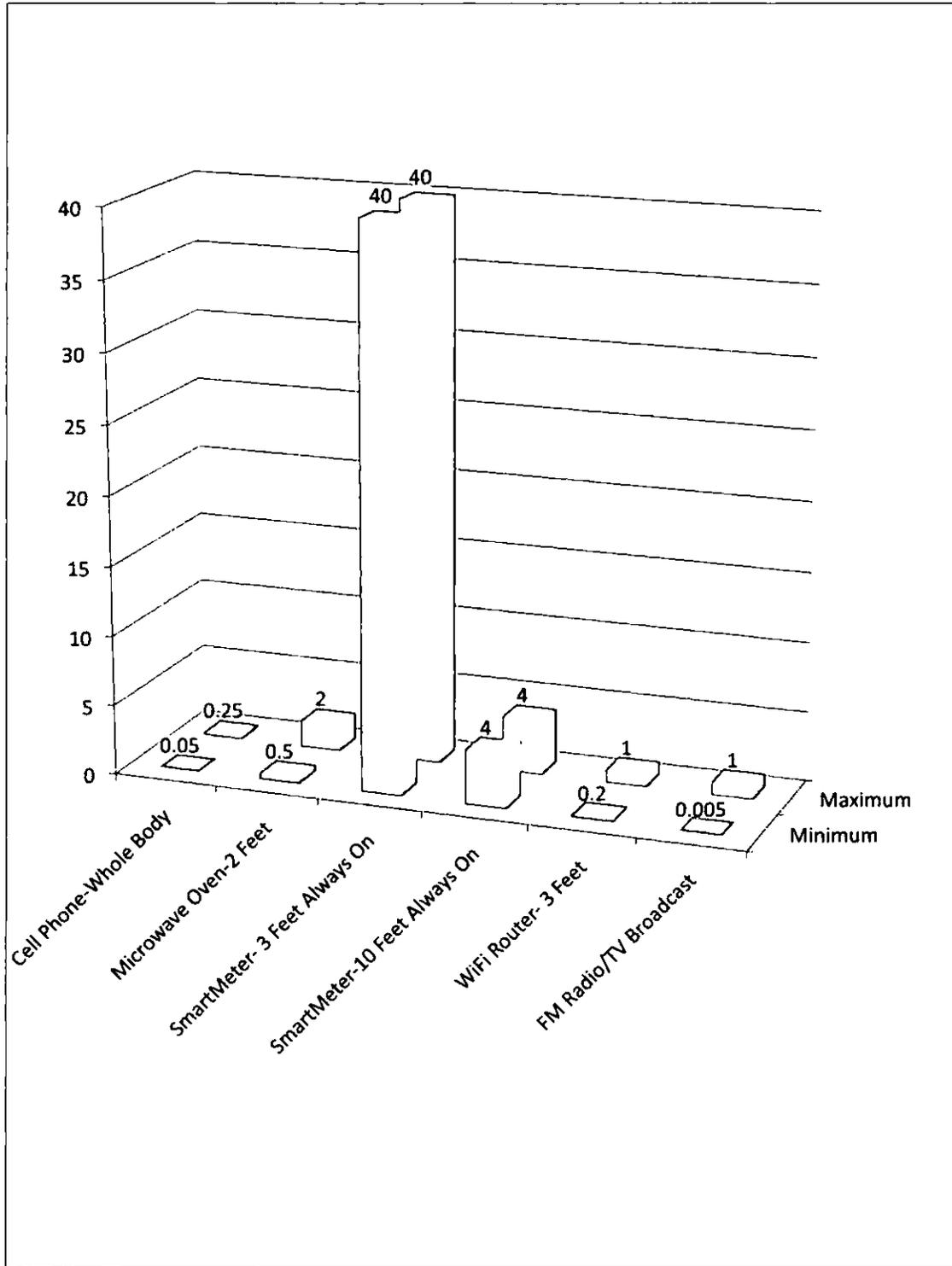


Figure 3. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected for assumed duty cycle and whole body exposure extrapolated from assumed cell phone dose at ear].

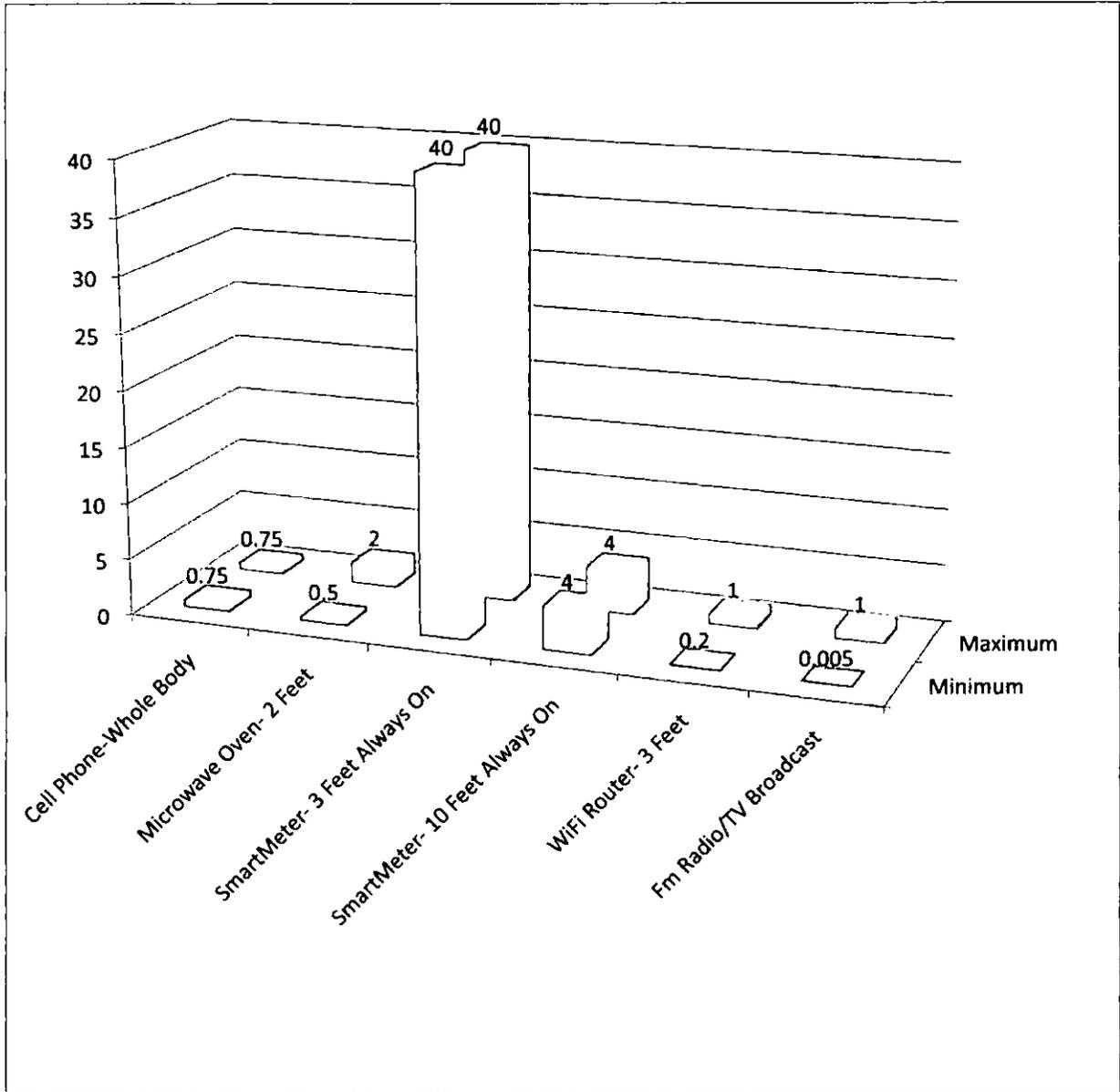


Figure 4. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in $\mu\text{W}/\text{cm}^2$ over time [corrected for assumed duty cycle and whole body exposure extrapolated from EPRI/CCST SmartMeter estimated levels at 3 feet].

**Commentary on the California Council on Science and Technology Report
"Health Impacts of Radio Frequency from Smart Meters"**

**By Dr. Karl Maret
Dove Health Alliance, Aptos, CA
January 30, 2011**

This is a commentary on the California Council on Science and Technology (CCST) report, "Health Impacts of Radio Frequency from Smart Meters" published January 2011. I submit that the CCST report, written in response to health concerns expressed by Assembly Members of the California Legislature, contains inaccuracies and minimizes the biological effects and health impacts of non-thermal radiofrequency radiation, such as those produced by wireless technologies including Smart Meters.

For the record, my qualifications to make this commentary are that I hold a Bachelor of Science in Electrical Engineering, a Master of Engineering degree in Biomedical Engineering, and a Medical Doctor degree and have additionally completed a four year post-doctoral fellowship in physiology. I have been interested in the health effects of electromagnetic fields (EMFs) for many years and given lectures about the potential health impacts of non-ionizing radiations, both in Europe and the United States. I am president of a non-profit foundation interested in energy medicine, a sub-specialty within the field of Complementary and Alternative Medicine (CAM) as defined by the National Center for Complementary and Alternative Medicine (NCCAM), a center within the U.S. National Institutes of Health (NIH).

My specific concerns with the report are as follows:

1. The minimization of the problem of non-thermal microwave radiation;
2. The minimization of the need for lower exposure standards;
3. The increase in radiation levels at potential local hotspots through reflection;
4. The lack of information about the impact of pulsed radiation from Smart Meters;
5. The lack of information on the health impacts of night-time radiation from Smart Meters;
6. The lack of modeling or actual measurements of the contribution from Smart Meters to the existing background microwave radiation;
7. The lack of health and environmental consideration by the CPUC when the Advanced Metering Infrastructure (AMI) was approved.

Until these issues are more fully addressed it is recommended that the current Smart Meter deployment using radiofrequency radiation (RFR) be halted pending a more unbiased reassessment of the potential health issues associated with these meters, including a reassessment of the Advanced Metering Infrastructure (AMI) program approved by the California Public Utilities Commission (CPUC) without any environmental impact assessment. Further, that the California public be offered the option to opt out of this program, which at present is mandatory for every dwelling.

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1. Minimization of Non-thermal Microwave Radiation from Smart Meters

On page 4 of the CCST report it states that *“To date, scientific studies have not identified or confirmed negative health effects from potential non-thermal impacts of RF emissions such as those produced by existing household electronic devices or smart meters.”* This finding minimizes the extensive body of scientific research on the biological effects of non-thermal electromagnetic fields. The biological effects of low-level, non-thermal electromagnetic fields have been researched for over 30 years. The respected 2007 Handbook of Biological Effects of Electromagnetic Fields edited by Barnes and Greenebaum (1) states on page 377:

“The biophysical lore prevailing until the late 1980s and lingering to this day is that, unless the amplitude and frequencies of an applied electric field were sufficient to trigger an excitable membrane (e.g. heart pacemaker), produce tissue heating or move an ion along a field gradient, there could be no effect. However, this position had to be changed as the evidence for weak (non-thermal) EMF bioeffects became overwhelming.”

Prof. Arthur Pilla, PhD
Professor of Biomedical Engineering, Columbia University

There are numerous reports on the potential health effects of non-thermal electromagnetic fields. Early reports include papers by Frey (1993), Lai (2000) and Hyland (2000), among many others. An international working group has delineated many additional scientific findings (Bioinitiative report, 2007). Special editions of the journal Pathophysiology were specifically dedicated to this topic recently (Pathophysiology, 2009). Recently, the European Journal of Oncology published an entire monograph entitled “Non-Thermal Effects and Mechanisms of Interaction between Electromagnetic Fields and Living Matter” outlining non-thermal effects on living systems. This came from the National Institute for the Study and Control of Cancer and Environmental Diseases “Bernardino Mamazzini” (Giuliani & Soffriti, 2010).

The CCST report further states that, *“Without a clearer understanding of the biological mechanisms involved, identifying additional standards or evaluating the relative costs and benefits of those standards cannot be determined at this time.”* I strongly disagree with this conclusion as there is now a large body of scientific literature describing several key mechanisms for the action of weak electromagnetic fields. These include, among others:

- removal of calcium ions bound to cellular membranes, leading to their weakened structure and changed cellular functioning
- change of calcium ion leading to changes in metabolic processes in cells,
- the leakage of calcium ions into neurons generating spurious action potentials,
- fragmentation of DNA in cells seen through the Comet assay
- changes in the blood-brain barrier in animals after microwave exposure
- defined cellular stress response, including the production of heat shock proteins (HSP), that are triggered electromagnetically at non-thermal levels that require much less energy than when triggered by heat (so-called thermal considerations)
- activation of specific genes by exposure to non-thermal electromagnetic fields leading to gene transcription to form RNA, the first stage in the synthesis of proteins

All these biological effects are well substantiated in the scientific literature and occurred at much lower exposure levels than current FCC standards, but are minimized by the CCST report. It takes many years for definitive health effects to be substantiated beyond all shadow of doubt. Yet the evidence is accumulating that health effects will become more widespread, given sufficient time, from the scientifically researched biological responses to RFR. Until the authors of the CCST report can clearly substantiate their conclusions that the California population will not be adversely affected by the Smart Meter program, a precautionary approach should have been recommended.

The European community has been more concerned about non-thermal radio frequency radiation effects while our government has essentially stopped funding all research in this area (see below). The extensive REFLEX study involving research groups from seven countries found effects on biological systems from cell phone radiation at levels 1/40th of the level of accepted safety guidelines promulgated by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) (Adlkofer, 2006). This report focused on a four year international collaboration of twelve European research groups involving in vitro studies of non-thermal radiofrequency radiation from cell phones. Even Austrian insurance companies are now accepting the dangers from non-thermal electromagnetic radiation from cell phones (AUVA Report, 2009).

Biological systems often respond in a non-linear manner and there is a large degree of genetic variability as to how animals or people are affected. Non-thermal EMFs might be comparable to the hazards of low levels of toxins found in the environment which can be potent in very low levels at disrupting enzyme systems in the body, but may not be proportionately worse at higher levels.

Dr. Richard Gautier in France offered a full description of active mechanisms for the action of non-thermal EMFs. There are peer-reviewed scientific studies for each step of the processes that can lead to chronic diseases such as cancer, leukemia and neurological diseases. These conditions often require longer time periods to develop and the Precautionary Principle (see later) ought to be applied when adding new sources of microwave radiation such as those from Smart Meters that are active night and day in our homes and places of work.

On page 14 of the CCST report, the statement "*There is currently no definitive evidence linking cell phone usage with increased incidence of cancer*" is another misleading statement that tends to minimize the cancer risk from cell phones. If the authors of the CCST report had looked at other papers from the scientific literature (not mentioned in pages 38-44 of the CCST report), they might come to different conclusions.

There is mounting evidence of various types of tumors being caused from cell phone usage including parotid gland tumor (Czerninski, 2011), meningioma (Hardell et al., 2006), acoustic neuroma (Sato et al. 2011), brain tumors (Hardell&Carlberg, 2009) and testicular tumors (Hardell et al., 2007), to name only some. Considering the increasing number of scientific papers describing various types of tumors associated with non-thermal radiation from cell phones that are appearing in the medical literature, it is not helpful that non-thermal radiations from Smart Meters, which might potentially add to our long-term susceptibility to serious diseases, be minimized as was done in the report.

2. The minimization of the need for lower exposure standards

The report states on page 8 that “...given the existing uncertainty about non-thermal effects, there is no generally accepted, definitive, evidence-based indication that additional standards are needed.” This statement is misleading since an international collaboration of researchers in this field have called for a reexamination of the current ANSI standard based on the increasing evidence of the adverse effects of low-level electromagnetic fields (Hardell and Sage, 2008) Various research groups have consistently warned that the existing guidelines may be inadequate (Hyland, 2000; Levitt & Lai 2010; Bioinitiative Report, 2007).

Even the International Commission on Non-Ionizing Radiation Protection (ICNIRP) stated in 1998 that “interpretation of several observed biological effects of electromagnetic fields is further complicated by the apparent existence of “windows” of response in both the power density and frequency domains. There are no accepted models that adequately explain these phenomena, which challenge the traditional concept of a monotonic relationship between the field intensity and the severity of the resulting biological effects.” (ICNIRP, 1998). In other words, there are windows of sensitive biological response in which potential health effects can occur at much lower exposure levels than currently mandated by the FCC standards.

Already in 1999, the federal government’s Radiofrequency Interagency Work Group (RFIAWG) had “identified certain issues that we believe need to be addressed to provide a strong and credible rationale to support RF exposure guidelines.” Dr. Gregory Lotz from the Department of Health and Human Services, National Institute for Occupational Safety and Health addressed these specific issues in a letter dated June 17, 1999 to Mr. Richard Tell, then Chair of the IEE SCC28 (SC4) Risk Assessment Work Group. Ironically, it was this same Richard Tell Associates of Las Vegas, NV who wrote the report for PG&E describing the apparent safe exposure limits of the Smart Meter program that was also referenced in the CCST report (Tell, 2005; Tell, 2008).

The Tell Associates report simplified the apparent safety of the Smart Meter radiation by: 1. Only considering a single isolated Smart Meter radiator in free space; 2. Time averaging the pulse RF radiation so that it appeared as a low level of 8.8 uW/cm^2 ; 3. Not considering other RF microwave emitters in the home environment; and 4. Considering only ground wave reflections of the microwave emissions and no other reflective surfaces (see below). The report also does not address the concerns of the federal RF Interagency Work Group including among other concerns: 1. The biological basis for local SAR limit; 2. the selection of an adverse effect level; 3. the nature of acute versus chronic exposure; 4. the intensity or pulsed or frequency modulated RF exposure; and 5. the issue of time averaging. These are critical issues which makes the issue of proper exposure guidelines a central issue in this matter. It further casts great doubt on the conclusions of the CCST report that downplays the need for new, lower exposure standards.

Epidemiologic evidence is a major contributor to the understanding of the potential effects of EMF on health. The International Agency for Research on Cancer (IARC) classified EMF as a “possible human carcinogen”, or a Group 2B carcinogen; (IARC, 2002) this classification was mostly based on consistent epidemiological evidence. Although the body of evidence is

always considered as a whole, based on the weight of evidence approach and incorporating different lines of scientific enquiry, epidemiologic evidence, as most relevant, is given the greatest weight.

Several European countries, having taken a deeper look at recent scientific data, are beginning to follow a different approach to the RFR question. They recommend prudent avoidance in siting cell tower antenna installations near schools, hospitals or wherever people congregate. This approach is part of what is called the Precautionary Principle, which has been adopted in many countries, including the U.S., for various applications in international treaties. The Precautionary Principle holds that when questions of safety are concerned, precautions should be taken to protect public health even if scientific data is incomplete, or the mechanisms of action are not understood (Levitt, 2000; Kheifets et al., 2001).

3. The increase in radiation levels at potential local hotspots through reflection

Although it is true that the Smart Meters comply with current U.S. Federal Communications Commission (FCC) guidelines because they operate below the existing power density thresholds, power density is not the only factor determining biological effects from radiofrequency radiation. The power density level safety standards are solely based on thermal considerations, yet it is the non-thermal radiation levels that are the key to potential health impacts. The non-thermal effects occur at lower levels from various emitting radiators now in common use including cell phones, cordless phones, Wi-Fi, Wi-Max, to name only some. Smart Meters add to this cumulative ubiquitous low-level background microwave environment.

RFR can increase to higher levels than anticipated due to surface and ground reflections from the various radiators. (Hondou, 2002; Hondou et al,2006;Vermeeren et al, 2010), even at some distance from the sources. These scientific studies suggest that reflectivity from other metallic surfaces and reflective materials could increase the power density of the RF fields significantly, leading to the development of hot spots in our homes. Richard Tell Associates report commissioned by PG&E in 2005, and updated in 2008, contained calculations of the intensity of RF fields produced by the Smart Meters that included only ground reflections estimated to increase the field strength by 1.6 times (equivalent to a 2.56-fold increase in the power density). In light of recent scientific findings and actual computer modeling studies, the Tell estimate of ground reflectivity may be significantly too low and does not address the development of possible hotspots in the home. If microwave hotspots occurred near sleeping quarters or near a baby's crib, their health impact could be highly significant. Sage Associates report, which made some estimates of Smart Meter impacts through computer modeling, even suggests that under certain assumptions the emissions from Smart Meters and their local reflections might even exceed FCC standards (Sage. 2011).

The CCST report never even acknowledged the need for computer modeling to ascertain the potential risk of higher microwave radiation levels in our homes as a result of Smart Meter installation, alone or in interaction with other microwave emitters. We believe that such modeling is vital if the public is to know the potential for the development of hot spots in sensitive living areas. The Richard Tell Associates study carried out for PG&E did not consider other microwave sources in the environment stating, "*The study does not take into*

account the potential for RF fields that may be produced by other devices or systems that are not part of the Smart Meter program upgrade. Such devices or systems include cellular telephones, cellular telephone base stations, broadcast radio and TV stations, microwave ovens used in the home or any other source of RF energy."

4. The lack of information about the impact of pulsed radiation from Smart Meters

There is a considerable difference between the biological impact of pulsed microwaves, as produced by Smart Meters, compared to continuous waves, such as those produced by microwave ovens. No distinction is made in the safety criteria between continuous and pulsed waves because of the narrow-minded focus on thermal damage alone. Many scientific studies have pointed out that radiofrequency radiation with different modulations and pulse characteristics produce different biological effects even though they may produce the same pattern of different specific absorption rate distribution and tissue heating (Levitt & Lai, 2010).

Peer-reviewed studies have shown that the differences in modulation patterns and waveforms can produce quite different biological effects. They include the works of Arber and Lin (1985); Campisi et al (2010); Huber et al. (2002); Luukkonen et al. (2009); d'Ambrosio et al (2002), among many others. Already Soviet research in the 1960s showed that pulsed waves induced stronger and often inhibitory biological and neurological effects than continuous waves (Osipov, 1965). A review of the hazards to U.S. military personnel from high frequency electromagnetic radiation was provided by Pollack (1967) which gives an overview of the extensive Eastern European research in this field.

Marha (1963) described allowable intensities for frequencies above 300 MHz in Czechoslovakia for continuous waves as 25 $\mu\text{W}/\text{cm}^2$ but limited pulsed waves to only 10 $\mu\text{W}/\text{cm}^2$. Note that these Czech recommended levels were considerably lower than the approximately 600 $\mu\text{W}/\text{cm}^2$ allowed for the RFR from Smart Meters operating in the low 900 MHz band mandated by the FCC based on only thermal consideration. Also not well known in the West is the Soviet work showing the adverse effect of non-thermal pulsed microwave radiation on cardiac rhythms in animals (Presman & Levitina, 1962).

The CCST report is misleading because it compares the Smart Meter emissions to those of microwave ovens. Microwave ovens produce much higher power output but are not modulated or pulsed in any way. It is imperative to understand that it is the modulation or pulsation pattern that leads to biological effects at non-thermal power levels. Biologically-sensitive amplitude windows have been found at specific frequencies that lead to the selective release of calcium from cell membranes. However, above and below these unique power densities there is no observable effect. Pulses and square waves have the greatest biological impact because they produce rapid changes in voltage across biological membranes. Un-modulated carrier waves have little or no biological effect except if their power is sufficient high, such as in microwave ovens. Comparing the power levels between modulated and un-modulated devices, as the CCST report does, is thus misleading.

The potential health effects from chronic exposure to pulsed, low power density level electromagnetic fields might take several years to appear. These types of radiations produced

by Smart Meters are of concern for their potential health impacts on the electrically hypersensitive part of the population. In Sweden, electrohypersensitivity (EHS) is an officially recognized functional impairment; however it is not regarded as a disease (Johansson, 2006). Electrical hypersensitivity has been reported by many authors from various industrialized countries over the last 20 years. The CCST report does not consider this segment of our population at all. Yet in the United Kingdom there are excellent resources about this condition, especially the work of Bevington (2010) containing over 700 references.

The ICNIRP, IEEE and ANSI standards that are currently in effect consider only thermal effects of microwave radiation where the energy absorption is fairly linear and thus the protective guidelines are logical. However these energy absorption guidelines would not be appropriate when frequency-specific amplitude windows are involved leading to adverse biological effects that can depend on modulation patterns, pulse repetition rates, duty cycles, and other frequency spectrum characteristics. With the current PG&E-mandated Smart Meter program having a 20-year life expectancy, Californians will be living with potential health impacts from this unproven technology in our homes for the next two decades.

5. The lack of information on the health impacts of night-time radiation from Smart Meters

Another problem that was not addressed in the CCST report is potential health effect of microwave radiation exposure during our sleep which may adversely affect our biological and circadian rhythms (daily physiological regulatory cycles). Smart Meters will pulse intermittently day and night and may have an adverse effect on sleep cycles. We do not use our cellphones during sleep, yet Smart Meters will continue to emit pulsed RFR all night long.

Exposure to microwave/radiofrequency fields affect the neuroendocrine system causing neuroendocrine chemical modulations and behavioral reactions. Already in 1970s it was known that resonant absorption within the cranium may result in the focusing of energy and the production of electromagnetic "hot spots" in the brain (Johnson & Guy, 1972). Microwaves may disturb the critical hormonal regulatory areas including the hypothalamic-pituitary axis through "low intensity" exposure. The body may elicit "different responses relative to the timing of the exposure with respect to circadian rhythm" (Michaelson, 1982). At night, while sleeping, the body is principally in a repair mode and the exposure to microwave radiation from Smart Meters may potentially be more damaging than exposure during the day. It is vital that long-term exposure studies during the night be carried out to determine if Smart Meter pulsed microwave radiation could have an adverse biological effect on our population.

The European Commission's Scientific Committee on Emerging and Newly Identified Health Risks report on "Health Effects of Exposure to EMF" stated that "*No health effect has been consistently demonstrated at exposure levels below the ICNIRP-limits established in 1998. However, the data base for this evaluation is limited especially for long-term low-level exposure*" (SCENIHR, 2009). In other words, we just don't know what will be the long-term

effect of consistent low level exposure of RFR such as those imposed by Smart Meters in addition to the other microwave radiation sources now increasingly being used in our homes.

6. The lack of modeling or actual measurements of the contribution from Smart Meters to the existing background microwave radiation

The CCST report is misleading on page 20 where it says that the exposure levels to people living in metropolitan areas is quite low, around 0.005 uW/cm^2 . They base their assertions on an outdated report from July 1986 made by the U.S. Environmental Protection Agency entitled *The Radiofrequency Radiation Environment: Environmental Exposure Levels and RF Radiation Emitting Sources*, EPA 520/1-85-014. This data is totally outdated since it reflects the situation before the modern cellular telephone networks were put in place.

Already in 2000, in Sweden, the radiofrequency and microwave radiation levels in urban areas were approximately ten times higher than they were in the 1980s—and most of the increase is due to wireless communications, according to Dr. Yngve Hamnerius of Chalmers University of Technology in Göteborg, Sweden. Hamnerius measured radiation levels in the 30 MHz-2 GHz frequency range at 26 sites across Sweden with varying levels of urbanization. In cities, the median power density was 0.05 uW/cm^2 , with a 61% average contribution from GSM cell tower base stations. (Microwave News, July/August 2000). In the U.S. we do not have any up-to-date data since the U.S. Environmental Protection Agency has not carried out any research studies for two decades. I have personally measured background microwave radiation levels that are hundreds of times higher in many metropolitan areas than the values described in the CCST report using 1986 EPA data.

This increasing amount of background microwave radiation has become of medical concern in many parts of the world. For example in March 23, 2009 European scientists called for a reassessment of the damaging health impacts of increasing levels of electromagnetic radiation (Electrosensibilité : Appel des scientifiques du 23-03-2009). Similarly, in November 2009 a meeting of international experts on the biological effects of electromagnetic fields met in Stavanger, Norway to discuss the unprecedented global exposures to artificial electromagnetic fields from communication and power technologies. Many scientists at this meeting recommended that lower limits be established for electromagnetic fields and wireless exposures due to the health impacts at much lower exposure levels than are now considered safe.

The United States government essentially stopped all research on RF radiation effects on the environment, including population exposure, in 1996. The Environmental Protection Agency's budget and staffing for RF radiation activities was \$821,000 from 1990 to 1995 and only \$25,000 between the years 1996 to 2000 (Levitt, 2000, page 271). Essentially, there was no government money spent in the last 15 years by the EPA to fund a reexamination of the RF exposure limits by the National Council on Radiation Protection and Measurement (NCRP). Our changing microwave environment is thus not being studied by our federal government. If the federal government is not looking after our health concerns concerning low level electromagnetic fields, it is imperative that utilities have their new microwave technologies evaluated by state government research laboratories or public health

organizations prior to letting this technology be deployed on a largely unaware California public.

What is needed is an up-to-date series of measurements in dense urban environment that measures the combined RFR levels from all radiating emitters and estimates or measures the cumulative effect of Smart Meters and collectors to radiation exposure levels in homes. This must include all RFR emitters that are connected to the MESH and home area networks (HAN) as deployed by PG&E. Only independent assessments or measurements of these radiation levels ought to be considered, not those conducted by companies that have direct or indirect connection to the utilities. Until these studies are available, it is recommended that the Precautionary Principle be adopted.

7. The lack of health and environmental consideration by the CPUC when the Advanced Metering Infrastructure (AMI) was approved.

On July 20, 2006, the California Public Utilities Commission (CPUC) issued their final opinion, Decision 06-07-027, authorizing Pacific Gas and Electric to deploy an Advanced Metering Infrastructure (AMI) that would lead to the automation of 5.1 million electric meters and 4.2 million gas meters. The CPUC decision was in response to PG&E's application 05-06-028 filed on July 16, 2005. In Section 7 (Technology) of this CPUC decision, the AMI deployment was described as using Power Line Carrier technology for electric meters and a fixed network system with radio frequency communications channels owned by PG&E for gas meters. The system was to have a useful life of 20 years. In section 15 (Environmental Review) of the Decision, it stated that there is no need for an analysis of PG&E's AMI deployment pursuant to the requirements of the California Environmental Quality Act (CEQA). It appeared that due to the suggested Power Line Carrier technology to be employed, the health or environmental effects were not considered at the time and the CPUC felt under no legal obligation to undertake any environmental review before approving the PG&E application.

On March 12, 2009, the CPUC made another Decision 09-03-026 in response to PG&E's application A.07-12-009 filed on December 12, 2007 to expand the AMI program significantly. Now the CPUC approved the establishment of microwave mesh networks as well as incorporating a Home Area Network (HAN) gateway device into advanced electric meters to support in-home HAN applications; and upgrading PG&E's electric meters to solid state meters, now called Smart Meters. In this decision, which conveniently expanded its 2006 AMI deployment decision, there was absolutely no mention of any environmental or health impact even though a whole new radiofrequency technology infrastructure was now approved for deployment on every home and business in California. We believe that this decision represents a gross degree of negligence by the CPUC in protecting the health and safety of the citizens of California. The CPUC needs to readdress the health and safety issues directly and immediately halt the installation of the Smart Meter program pending clarification of the issues raised by many scientific investigators who have commented on the inadequacy of the CCST report.

Conclusions

The time needed for a new technology to be developed and rolled out is much shorter than the time needed for research to investigate the possible health effects on the general population. The current Advanced Metering Infrastructure using microwaves in the 900 MHz frequency spectrum approved by the CPUC is going to adversely impact the physiology and ultimately the health of many Californians over the next twenty years, the anticipated life time of the Smart Meters now being deployed. This program is being implemented without widespread public knowledge or approval and without the specific informed consent in writing from every household.

Already the most sensitive members of our society, those who are especially vulnerable by being electrically hypersensitive, are registering health complaints such as headaches, sleep disturbances, cognitive difficulties, dizziness, heart palpitations, to name only a few. Most of these symptoms could also be related to other medical conditions making it difficult to ascribe their appearance specifically to the Smart Meters radiation directly. Although not yet recognized in this country as a state of physiological imbalance, hypersensitivity of human subjects to exposure to electric and magnetic fields has been reported for over 20 years by many authors in many industrialized countries. If only 1% of California's population were to report symptoms of electrical hypersensitivity after Smart Meter installation, over 370,000 people might be adversely affected by RFR.

The dissemination of this Smart Meter technology could have been accomplished without using radiofrequency radiation by using much safer power line, fiber optic or telephone communications technology. For example, a Smart Meter power line communications technology was used by Italian utilities in 27 million households using meters designed in California. In the Netherlands, the population concerned about the security and health issues of Smart Meters was given the options to opt out from having the meters installed. Californians were never given this option. Yet this AMI program, costing utility customers over \$2 billion, represents the largest technology roll-out in the history of Pacific Gas and Electric. Ironically, it is being financed by the rate payers without their direct consent.

This program represents an epidemiological experiment involving our unsuspecting population whose outcome will only be fully known after many years exposure. It is being shepherded through the regulatory process by the CPUC who has not seen fit to study the possible adverse health impacts of this technology before approving its usage. It has never shown any willingness to seriously consider the well-documented non-thermal effects of pulsed microwaves on living systems and will undoubtedly use the misleading CCST report to avoid any questions about future health implications of this technology. Because of the uncertainties of adverse long-term health impacts, the CCST ought to have recommended that a Precautionary Principle be invoked that would allow more time to directly study the effect of this pulsed radiation with both in vitro and in vivo testing in realistic settings of the mesh network, especially in high density Smart Meter environments in our cities.

Additionally, in cities the Subterranean Network Deployment System (SUNDS) is now also being installed by PG&E. This will add even higher microwave exposure levels to the general population. Any description of this new system was conspicuously absent from the CCST report. At a minimum, the utilities and CCST ought to have carried out extensive

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computer modeling to assess the impact of Smart Meter technology in realistic settings, taking into account the other wireless technologies have already been deployed and which have significantly increased the background microwave exposure of the population over the last 20 years.

In summary, we find that the CCST report is incomplete and misleading giving California State regulators a false sense of security while potentially endangering the future health and well-being of Californians. It is requested that the current Smart Meter deployment be halted pending a more comprehensive scientific investigation of the biological response and health impacts of the non-thermal aspects of this technology. All households should be offered full disclosure about possible exposure levels, modulation patterns, peak power levels and interactions with other parts of the microwave spectrum in their home environments. Additionally, those who are sensitive to this radiation must be given the choice to opt out from having this form of RFR imposed upon their residential dwellings.

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American Academy of Environmental Medicine Recommendations Regarding Electromagnetic and Radiofrequency Exposure

Physicians of the American Academy of Environmental Medicine recognize that patients are being adversely impacted by electromagnetic frequency (EMF) and radiofrequency (RF) fields and are becoming more electromagnetically sensitive.

The AAEM recommends that physicians consider patients' total electromagnetic exposure in their diagnosis and treatment, as well as recognition that electromagnetic and radiofrequency field exposure may be an underlying cause of a patient's disease process.

Based on double-blinded, placebo controlled research in humans,¹ medical conditions and disabilities that would more than likely benefit from avoiding electromagnetic and radiofrequency exposure include, but are not limited to:

- Neurological conditions such as paresthesias, somnolence, cephalgia, dizziness, unconsciousness, depression
- Musculoskeletal effects including pain, muscle tightness, spasm, fibrillation
- Heart disease and vascular effects including arrhythmia, tachycardia, flushing, edema
- Pulmonary conditions including chest tightness, dyspnea, decreased pulmonary function
- Gastrointestinal conditions including nausea, belching
- Ocular (burning)
- Oral (pressure in ears, tooth pain)
- Dermal (itching, burning, pain)
- Autonomic nervous system dysfunction (dysautonomia).

Based on numerous studies showing harmful biological effects from EMF and RF exposure, medical conditions and disabilities that would more than likely benefit from avoiding exposure include, but are not limited to:

- Neurodegenerative diseases (Parkinson's Disease, Alzheimer's Disease, and Amyotrophic Lateral Sclerosis).²⁻⁶
- Neurological conditions (Headaches, depression, sleep disruption, fatigue, dizziness, tremors, autonomic nervous system dysfunction, decreased memory, attention deficit disorder, anxiety, visual disruption).⁷⁻¹⁰
- Fetal abnormalities and pregnancy.^{11,12}
- Genetic defects and cancer.^{2,3,13-19}
- Liver disease and genitourinary disease.^{12,20}

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Because Smart Meters produce Radiofrequency emissions, it is recommended that patients with the above conditions and disabilities be accommodated to protect their health. The AAEM recommends: that no Smart Meters be on these patients' homes, that Smart Meters be removed within a reasonable distance of patients' homes depending on the patients' perception and/or symptoms, and that no collection meters be placed near patients' homes depending on patients' perception and/or symptoms.

Submitted by: Amy L. Dean, DO and William J. Rea, MD

Approved July 12, 2012 by the Executive Committee of the American Academy of Environmental Medicine

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

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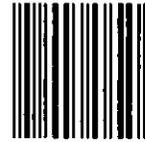
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