Legal, Constitutional and Human Rights Violations of Smart Grid and Smart Meters

Congressional White Paper

http://www.StopSmartGrid.org

With In Depth Writings and Contributions by: Nina Beety, Marilynne Martin,

Other Special Contributions by: Mike Hazard, Karen Miller, Lisa Verlato Nancollas, Arnie Rosner,

Written and Edited by: Liz Barris

Contact info:
Liz Barris, 310-455-7530
contact@thepeoplesinitiative.org
101 S. Topanga Cyn. Blvd. #586
Topanga, CA 90290

FOREWARD

Although there have been some pretty outrageous tax payer funded financial give aways to large corporations, none quite compare to the advent and deployment of the smart meter and smart grid program.

Sold to trusting citizens as "green, energy saving, financially thrift and ultra safe", as you will see evidenced in this paper, nothing could be further from the truth.

The smart grid and smart meter "deployment" (military term) in the US has been precedent setting in numerous ways. The sheer number of legal violations are simply staggering, not to mention the conditions under which the roll out was conducted; giving citizens no freedom of choice, under threat and implementation of arrest and denying citizens rights to basic necessities such as water, gas and electricity, upon refusal of a smart meter. All this in direct violation of the very bill that funded the program and the very laws that make our country a democracy – **The United States Constitution**.

Let it also be known that this is a global roll out, not merely for America, implemented by forces that may not necessarily have American's best interests at heart, but do have their own desire for surveillance, control and greed.

This document reveals not only reasons why not one more penny of citizen tax dollars should be pumped into this abysmal, corrupt, illegal and punishing program, but also clearly shows that by incentivizing through freely given citizen tax money, the government has created an unfair fight between the utilities, their partners in crime – government agencies like the NSA (or any 3rd party wishing access to this information) and the citizens of the United States who wish to retain their Constitutional rights to health, life, property and privacy.

Citizens who wish to give up their legal and Constitutional rights to health, life and privacy (provided they do not harm others in the process) should be free to do so by being fully informed of the ramifications of a smart meter on their property or the smart grid in their neighborhood, while those who wish to retain them should not be punished for doing so.

Citing Constitutional, legal and human rights violations, we sincerely, hope that Congress heeds our need to reverse the horrific damage to both our biology and rule of law caused by smart grid/smart meter roll out, and hold true to the US Constitution and other legal frameworks under which a true democracy can exist and thrive.

The following Congressional white paper lists Constitutional and other legalities that "deployment" of the smart grid and smart meters are in repetitious violation of, regarding both state and federal law. Each statement of violation is backed up with Constitutional and

other legal citations, court cases, news reports and articles in major publications in addition to some very personal, first hand accounts.

The citizens of the United States are being lied to regarding nearly every aspect of the smart grid and smart meter roll out, from "opting out" to the health effects, to over billing, to fire hazard, to privacy invasion and surveillance.

Congress and the White House must uphold rule of law and REMEDY the problems created by funding a biologically harmful, constitutionally violating and otherwise illegal program.

Throughout this report, our own commentary is written in italics for easier deciphering from articles and other verbiage.

We believe the utilities who accepted government funds for this program, owe the US Treasury and the citizens of the United States, this money returned, as it was gotten through illegal means as evidenced below and in violation of the bill that allowed for funding of the initiative in the first place, not to mention our Constitution. We call on Congress and the President of the United States to enact the following:

1) Due to multiple fatal flaws in the program, including national security, all federal funding of smart grid/smart meters must cease and desist.
2) The program must be "opt in" as opposed to "opt out" as was stipulated in 2005 Energy Policy Act, but not implemented in the "deployment" (military term). All customers must be offered a hard wired, analog option until a total smart meter ban is instated. Freedom to choose to have a smart meter may be given to customers, provided the meter does not cause physical harm to their neighbors.
3) Those not wishing to have a smart, advanced or digital meter must not be charged a fee of any kind or experience rate inceases of any kind simply for their wish to retain hard wire, analog metering.
4) Utilities or Congress or both, must pay for remediation for people who become ill from or lose or have lost housing to smart meters/smart grid in addition to possible lifelong compensation for any permanent damage caused to the individual.
5) Other forced microwave radiation exposure must also be addressed, such as the Telecom Act, WIFI in certain public places so that whole populations are not involuntarily and unwittingly exposed to this Class 2b carcinogen.
6) A full disclosure information campaign on potential health effects, surveillance, fire hazard and rate increases must be initiated and funded by utilities or even Congress. Citizens MUST be informed of these risks, hardships and violations.
7) Electrosensitivity must be officially recognized by our federal government as a functional impairment as it is in Sweden and recognized as a disability that falls under the ADA. Electrosensitive people need to be cared for and covered by their health insurance like with any other illness and doctors need to be able to address the health

needs of the afflicted, not to mention medical schools need to begin to study this 21st century phenomenon, along with any potential cures and of course prevention.

8) A separate agency needs be created for citizens, to look out for their health and well being on the issue of microwave radiation and other areas of the electromagnetic radiation spectrum. The wireless microwave industry has the FCC to look after their interests; we need our own agency with as much power to look out for ours. It is currently an unfair playing field on this issue in Washington.

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1) THE SECRETIVE, FINANCIAL, WATER SPIGOT THAT IS THE FFB (FEDERAL FINANCE BANK) AND CITIZEN TAX PAYER MONEY FREELY DISTRIBUTED TO PRIVATE CORPORATIONS FOR SMART GRID/ SMART METERS

To date, a minimum of 3.4 billion of US tax dollars has been spent on deployment (a military term for a civilian roll out?) of smart grid and smart meters, according to press releases and transparent record keeping. However, what is not accounted for in Congressional spending on smart grid, may accounted for in disbursement of citizen funds through the secretive FFB (Federal Finance Bank).

*On Feb. 24th 2014, a FOIA was sent to the FFB inquiring about how much money has been distributed from the FFB for the use of smart grid or smart meters. This FOIA has been ignored by the FFB, which means we may have to file suit to get the real numbers allocated for smart grid/smart meters. We can only guess out of the $28,000,000,000 (that's **28 billion**) in tax payer funds that we have on record flowing from the FFB to the utilities between the years 2006-2013 (after the 2005 Energy Policy Act was passed), how much has gone towards smart grid/meter roll out…we estimate a substantial amount.*

The practice of giving citizen taxpayer money to private corporations is in this case, criminal, due to all the legal and other Constitutional violations the smart program brings. The federal government has also created an extremely un-level playing field between the citizens who need to protect themselves from smart meters/smart grid and the governments and private companies who wish to benefit from them.

FFB - FEDERAL FINANCING BANK

http://www.treasury.gov/ffb/

The FFB, a bank set up with very specific parameters, is essentially being treated as a monetary water spigot for the utility industry and of course other possible misappropriated spending by the President, certain members of Congress and most likely other federal government agencies or personnel.

The Federal Financing Bank is being abused to fund such harmful programs "for" the general public as smart grid/smart meters. Freely given cash to private or municipal utility companies and military industrial companies for the purposes of controlling and/or monitoring American citizens in their own homes or for any other illegal act or program is a blatant abuse of the privilege the FFB provides the President and Congress.

The funding of the smart grid/smart meter program has set up an unprecedented, un-level playing field whereby only those American citizens who can afford to pay attorneys are able to combat in a court of law, this invasion and disruption of our health, lives and basic Constitutional rights.

Inherent to smart grid and smart meters is the complete and total violation of multiple Constitutional and other legal rights violations that have been both condoned by our federal government and paid for with hard earned US tax dollars.

Because of these violations, all funds that went to the utilities and towards this illegal program must be returned to the US Treasury.

To date, according to the American Recovery and Reinvestment Act, a minimum of 3.4 billion of US tax dollars has been spent on deployment (a military term for a civilian roll out?) of smart grid and smart meters. However, what is not accounted for in Congressional spending on smart grid, IS accounted for in what may be illegal disbursement of citizen funds through the FFB (Federal Finance Bank).

The below link contains a state by state breakdown of Recovery Act funding of smart grid, totaling ***$3,425,718,323*** *US citizen funded "deployment" of smart grid.*

http://stopsmartgrid.org/funding/

Additionally, there is an FFB (Federal Finance Bank) graph that shows the money doled out to utilites since passage of the 2005 Energy Policy Act, totaling, 28 Billion. This does NOT include funds for smart grid to Dept. of Defense or Dept of Energy.

http://www.treasury.gov/ffb/press-releases.shtml

Here is a link to the Federal Financing Bank's financial statements showing $28.2 Billion[1] loaned to utility companies through the U.S. Dept. of Agriculture's Rural Utilities Program since the Energy Policy Act of 2005. These are funds allocated solely by the U.S. Dept. of Agriculture, and exclude any smart grid money spent by the U.S Dept. of Energy or the Dept. of Defense.

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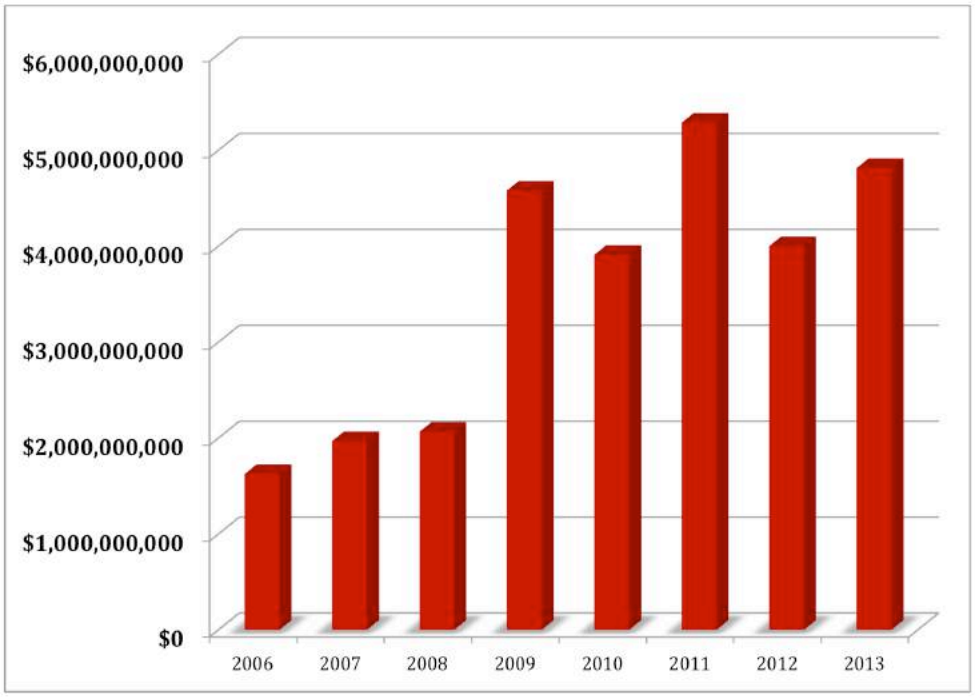
[1] This number is the total amount given to the Rural Utilities Program from 2006-2013 excluding any loan modifications, maturity extensions, interest rate resets, or principal rollovers. See the below breakdown taken from the Federal Financing Bank Press Releases of Financial Activity.

U.S. FEDERAL FINANCING BANK LOANS TO UTILITY COMPANIES



TOTAL: $28.2 BILLION

US DOE Inspector Says Its Management of Smart-Grid Program Lacking

http://www.platts.com/latest-news/electric-power/Washington/US-DOE-inspector-says-its-management-of-smart-6065357

"The US Department of Energy has failed to properly manage a $700 million program aimed at demonstrating the use of smart grid technology, with millions of dollars in questionable spending, the agency's inspector general said Wednesday."

"In the absence of significant improvements, the program is at risk of not meeting its objectives and has an increased **risk of fraud, waste and abuse."**

2) 4th AMENDMENT VIOLATIONS: SPYING AND INVASION OF PRIVACY THROUGH SMART METERS AND SMART GRID

The 4TH AMENDMENT

http://www.law.cornell.edu/constitution/fourth_amendment

"The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue, but upon probable cause, supported by oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized."

Smart meters and smart grid violate the 4th Amendment of the US Constitution by warrantless-ly searching every electrical, water or gas appliance in the home including potentially the ability to search personal computers. A primary advantageous use of smart meters and smart grid to NSA, DHS, CIA, DOE or any other government entity who wishes to do so, would be spying on US citizens in the sanctity of their own homes. This sets an unprecedented level of invasion of privacy and is in fact, according to the Constitution of the United States of America, ***illegal****.*

Before we get into the legalities of invading privacy within the home, let us first examine the history of the utilities on the issue of respecting peoples right to privacy, violation of trust and dishonesty at any cost to achieve their goal of smart grid and smart meter roll out.

http://www.mercurynews.com/ci_20481577/pge-employee-who-spied-activists-support-management-cpuc

"A probe by the California Public Utilities Commission has concluded that William Devereaux, a former PG&E employee who used a false identity **to spy on activists opposed to SmartMeters, did not act alone but had support from senior managers**."

"Devereaux resigned in November 2010 after admitting that he used the name "Ralph" to try to infiltrate an online group of consumers opposed to the utility's new digital meters."

"At the time, PG&E characterized him as a rogue employee who acted alone. But a lengthy investigation by the PUC's Consumer Protection and Safety Division revealed that Devereaux forwarded emails that he collected using the false identity to his boss and other senior managers at PG&E, including a member of the legal department."

"PG&E senior management knew of Mr. Devereaux's deceit before it was reported in the press and failed to prevent and stop his inappropriate behavior," said the eight-page finding from the PUC, released late Wednesday. "By lying to and infiltrating anti-smart meter consumer groups, Mr. Devereaux, acting on behalf of **PG&E, violated PG&E's obligation to provide just and reasonable service to its customers**."

*If a company lies and spies on those who differ with them on policy, imagine what they would do with granular data on such customers, or for that matter on ANY customer. Who else will be spied on through smart meters and by what corporation or government entity (it is hard to distinguish between the two these days) simply because they differ on policy? This is not a question citizens should ever have to ask. Our innate and Constitutional right to privacy within our own homes and work places **must** be respected.*

Now let's look at who else vying for unfettered access to granular data and intimate details about the customer's life within the boundaries of their own home or business. Notice granular, private information on citizens within the home is considered "a market of data" as opposed to what it actually is, private information about the activities of people within their own home, information that they have the legal right to retain.

3rd Party Access to Private, Personal Data Within the Home

http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/164999.pdf

Joint Reply Comments of AT&T and Verizon to March 1, 2012 Smart Grid Workshop Summary, A. 11-06-006 et al., May 17, 2012

AT&T and Verizon filed comments on the CPUC's Smart Grid Workshop summary about market access to consumer data from Smart Meters:

"A means to achieve a greater degree of certainty is to **establish forward-looking,**

precompetitive principles from the beginning that prohibit barriers to market entry. New 27 entrants need prompt, unfettered and reasonable access to the detailed customer usage data collected by a Smart Meter. And such access needs to reflect consistent, standardized methods across utilities."

A. **No barriers to entry:**
"The IOUs should not impose onerous, expensive or cumbersome technical or administrative requirements on third parties that want to participate in the Smart Grid market. Any qualified third party should be able to participate without delay or unnecessary expense. That said, it is understandable that certain safeguards may be necessary to ensure the security and integrity of IOU systems and customer information. **But any such network security safeguards should not become a means to impede or delay competitive entry or constrain innovation."**

Privacy laws and rules change. What consumers have a choice about divulging one year, becomes "no choice" the next. If agencies such as the CPUC do not listen to the public, as they have proven not to on this issue, then these issues must be fought with attorneys in courts of law, ***if*** *members of the public have the money and can find the attorneys to take their cases. This disrupts their lives and livelihoods and puts an undue burden on citizens who depend on the Constitution of the United States to be upheld and not deteriorated simply because someone sees a new way to make money on them at the expense of their of their civil liberties.*

CPUC Commissioner Timothy Allen views customer privacy merely as "market interest."

From the CPUC proceeding on privacy and the Smart Grid, Docket #: R 08-12-009 (July 28, 2011)

• Commissioner Timothy Alan Simon, "I support today's decision because it adopts reasonable privacy and security rules and **expands consumer and third-party access to electricity usage** and pricing information. **I hope this decision stimulates market interest in the data."**

And now of course, the inevitable and dreaded issue of government agencies spying on citizens:

CIA Chief: We'll Spy on You Through Your Dishwasher

http://www.wired.com/dangerroom/2012/03/petraeus-tv-remote/
"More and more personal and household devices are connecting to the internet, from your television to your car navigation systems to your light switches. **CIA Director David Petraeus cannot *wait* to spy on you through them."**
"Earlier this month, Petraeus mused about the emergence of an "Internet of Things" — that is, wired devices — at a summit for In-Q-Tel, the CIA's venture capital firm. "Transformational' is an overused word, but I do believe it properly applies to these technologies," Petraeus enthused, "particularly to their effect on clandestine tradecraft."

"With the rise of the "smart home," you'd be sending tagged, geolocated data that a spy agency can intercept in real time when you use the lighting app on your phone to adjust your living room's ambiance."

4th Amendment, Invasion of Privacy, Spying and the Law:

Judge Questions Legality of NSA Phone Records

http://www.nytimes.com/2013/12/17/us/politics/federal-judge-rules-against-nsa-phone-data-program.html?_r=1&

"WASHINGTON — A federal district judge ruled on Monday that the National Security Agency program that is systematically keeping records of all Americans' phone calls most likely violates the Constitution, describing its technology as "almost Orwellian" and suggesting that James Madison would be "aghast" to learn that the government was encroaching on liberty in such a way."

Drug Dogs Need Warrant to Sniff at Your Front Door

http://www.csmonitor.com/USA/Justice/2013/0326/Drug-dogs-need-a-warrant-to-sniff-at-your-door-Supreme-Court-rules-video

"The basic rule is that a search occurs for Fourth Amendment purposes when the government physically intrudes for investigative purposes on one of the areas that the amendment protects: that is, onto persons, houses, papers, or effects," Scalia said in announcing the decision in open court.

"When it comes to the Fourth Amendment, the home is first among equals," Scalia wrote. **"At the amendment's very core stands the right of a man to retreat into his own home and there be free from unreasonable government intrusion."**

Scalia gets it right

http://articles.latimes.com/2013/mar/27/opinion/la-ed-warrant-supreme-court-20130327

"But in 1967, the court adopted a broader definition of an illegal search when it ruled that the 4th Amendment was violated when police affixed a wiretap to the outside of a telephone booth being used by a gambler."

Smart Meter Data: Privacy and Cybersecurity

Congressional Research Office **Pg – 20**

www.fas.org/sgp/crs/misc/R42338.pdf

Mosaic and Dragnet Theories

The mosaic theory is grounded in the idea that surveillance of the whole of one's activities over a prolonged period is substantially more invasive than a look at each item in isolation.181 In the case of smart meters, this is the difference between knowing a person's monthly energy usage, and being able to discern a person's daily activities with considerable accuracy.

In *United States v. Jones*, **the police used a GPS tracking device to track Jones's movements for almost a month.183** The majority, led by Justice Scalia, held th**at attaching a GPS device on a vehicle for the purpose of collecting information constituted a "search" under the Fourth Amendment. Justices Alito and Sotomayor both agreed that this was a search, but on different grounds. Both discussed an adaptation of the mosaic theory as prohibiting police from tracking a person for an extended period of time.**

Justice Sotomayor agreed with this "incisive" observation, noting that "GPS monitoring generates a precise, comprehensive record of a person's public movements that reflects a wealth of detail about familial, political, professional, religious, and sexual associations."187

"A person who knows all of another's travels can deduce whether he is a weekly church goer, a heavy drinker, a regular at the gym, an unfaithful husband, an outpatient receiving medical treatment, an associate of particular individuals or political groups—and not just one such fact about a person, but all such facts."188

"With smart meters, police would have a rich source of personal data that reveals far more about a person than traditional analog meters. Understanding a person's daily activities, including what appliances he is using, is a far leap from knowing his monthly energy usage. This is the difference between knowing about a single trip a person took and monitoring his movements over a month-long period. The breadth and granularity of the smart meter data may be seen as warranting application of the mosaic theory and may perhaps find receptive ears on the Court."

Privacy Implications of Smart Meters

By Cheryl Dancey Balough
Balough Law Offices, LLCV
Chicago, Illinois

http://www.balough.com/uploadedFiles/Privacy%20Implications%20of%20Smart%20Meters%20-%20Cheryl%20Dancey%20Balough%281%29.pdf

In 2001, the Court held that warrantless use of the technology to view inside a home was prohibited by the Fourth Amendment.[126] **Warning that use of thermal imaging could disclose intimate details about personal activities, including "at what hour each night the lady of the house takes her daily sauna and bath,"** Justice Scalia opined that the Fourth Amendment **"draws 'a firm line at the entrance to the house.' That line, we think, must be not only firm but also bright."**[127]

Just because a product is funded with our tax dollars, by our federal government without our consent does not put it in the "general public use" category. This is sneaky, low ball tactics to force the public into compromised positions pertaining to their legal and Constitutional rights concerning property, privacy and right not be submitted to constant searches by police and government agencies.

"Given the rich detail of smart meter data, which can reveal intimate details about the electric customer's life, and the reality that electric customers have no true choice in whether or not to give the data to the utilities, courts might find this data beyond the warrantless reach of law enforcement."

Defendant's Motion to Suppress the Fruits of the Warrantless Search

http://tinyurl.com/m9ptplv

I. SEARCH WARRANT REQUIRED.

The United States and Ohio Constitutions guarantee the people's right to be secure in their persons and houses against unreasonable searches and seizures. The

"physical entry of the home is the chief evil against which the working of the Fourth Amendment is directed." Payton v. New York, 445 U.S. 573, 585 (1980) (quoting United States v. United States District Court, 407 U.S. 297, 313 (1972)). **It is a basic principle of Fourth Amendment jurisprudence that warrantless searches and seizures of a home are presumptively unreasonable.** Payton, 445 U.S. at 586. **The Fourth Amendment has drawn a firm line at the entrance to the house with respect to both searches and seizures of property and persons. The Ohio Constitution provides the same protection against warrantless searches.**

II. DEFENDANT DID NOT VALIDLY CONSENT TO THE WARRANTLESS SEARCH OF HIS RESIDENCE.

"When the State relies on consent for the warrantless entry of a residence it has the burden of not only proving consent, but also that the consent was freely and voluntary given."

"Acquiescence to authority (because of the demonstration of force) does not constitute a valid consent."

Payton v. New York - 445 U.S. 573 (1980)
U.S. Supreme Court
http://supreme.justia.com/cases/federal/us/445/573/

Payton v. New York
No. 78-5420
Argued March 26, 1979
Reargued October 9, 1979
Decided April 15, 1980*
445 U.S. 573

"In terms that apply equally to seizures of property and to seizures of persons, the Fourth Amendment has drawn a firm line at the entrance to the house."

Congressional Research Smart Meter Data, Privacy and Cyber Security Document

http://www.fas.org/sgp/crs/misc/R42338.pdf

Privacy and Cybersecurity - Loss of Privacy & Identify theft

“Unforeseen consequences under federal law may result from the installation of smart meters and the communications technologies that accompany them.”

4th amendment
“The Fourth Amendment, which establishes the constitutional parameters for government investigations, may restrict access to smart meter data or establish rules by which it can be obtained.[61] **The Fourth Amendment ensures that the “right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated....”**[62]

“…there are several core differences between smart meters and the general third-party cases that may cause concerns about its application. These include concerns expressed by the courts and Congress about the ability of technology to potentially erode individuals’ privacy.”

Smart Meters and the Fourth Amendment

“The Fourth Amendment ensures that the right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated....”[62] This section discusses whether the collection and use of smart meter data may contravene this protection. Although there is no Fourth Amendment case on point, analogous cases may provide guidance.[63]”

Page 13: (Starts near the top)

Reasonable Expectation of Privacy in Smart Meter Data

“Under the modern conception of the Fourth Amendment, the government may not intrude into an area in which a person has an actual expectation of privacy that society would consider reasonable.[107] In the case of smart meter data, the government presumably seeks records in the custody of third-party utilities on the energy use at a specific home.”

“There are two relevant differences, however, between smart meters and the traditional third-party cases that may warrant a shift in approach. First is the possible judicial unease with the notion that advancement of technology threatens to erode further the constitutional protection of privacy.[111] **From that perspective, as technology progresses, society faces an ever-increasing risk that an individuals activities will be monitored by the government. This is coupled with the concern that the breadth and granularity of personal information that new technology affords provide a far more intimate picture of an individual than the more limited snapshots available through prior technologies.** Do the richness and scope of new information technologies warrant increased constitutional scrutiny?”

"Second, **smart meters can convey information about the activities that occur inside the home, an area singled out for specific textual protection in the Fourth Amendment and one deeply ingrained in Anglo-Saxon law.**[112] Even when the Court declared that the Fourth Amendment protects people, not places, [113] ostensibly shifting away from a property-based conception of the Fourth Amendment, **it has still carved out special protections for the home.**[114]**"**

Privacy in the Home

"The location of the search mattered little in the traditional third-party cases, **but it may take on constitutional significance with smart meters.**[142] **In the case of smart meters, the information is generated in the home, an area accorded specific textual protection in the Fourth Amendment, and one the Supreme Court has persistently safeguarded.**[143] **In no uncertain terms the Court has asserted that at the very core [of the Fourth Amendment] stands the right of a man to retreat into his own home and there be free from unreasonable government intrusion.**[144] **Even as technology advances whether a tracking or thermal-imaging device or something new the Court has maintained this bulwark."**

"In the case of the search of the interior of homes the prototypical and hence most commonly litigated area of protected privacy there is a ready criterion, with deep roots in the common law, of the minimal expectation of privacy that exists, and that is acknowledged to be reasonable. To withdraw protection of this minimum expectation would be to permit police technology to erode the privacy guaranteed by the Fourth Amendment.[158]**"**

"The Court ultimately held that obtaining by sense-enhancing technology any information regarding the interior of the home that could not otherwise have been obtained without physical intrusion into a constitutionally protected area constitutes a search at least where (as here) the technology in question is not in general public use.[159] **Kyllo affirmed the notion that an expectation of privacy in activities taking place inside the home is presumptively reasonable.**[160]"
"The Court also protected home privacy by prohibiting the monitoring of the location of a beeper while inside a residence.[161] In United States v. Karo, with the consent of a government informant the police attached a beeper to the false bottom of a can of ether, which was sold to Karo.[162] The can of ether was transported between several residences and storage facilities.[163] The police used the beeper to monitor the location of the can several times while it was located inside of the residences.[164] **The Court was asked to determine whether the monitoring of a beeper in a private residence, a location not open to visual surveillance, violates Fourth Amendment rights of those who have a justifiable interest in the privacy of the residence.**[165] **The Court answered in the affirmative."**

"The Court reiterated the long-standing notion that private residences are places in which the individual normally expects privacy free of governmental intrusion not authorized by a warrant, and that expectation is plainly one that society is prepared to recognize as justifiable.[166] Unless there are exigent circumstances, searches and seizures inside a home without a warrant are presumptively unreasonable....[167] The Court ultimately held that the warrantless monitoring of the beeper in the home was a Fourth Amendment violation.[168] Kyllo and Karo demonstrate that the Supreme Court has defended the home as a sacred site at the core of the Fourth Amendment.[169]"

"Smart meters have the potential to produce significantly more information than that derived in Kyllo and Karo, including what individual appliances we are using; whether our house is empty or occupied; and when we take our daily shower or bath.[172] Further, a look at Figure 1, supra, makes it clear that this level of information is much more intimate than prior technologies used by law enforcement."

Privacy and the Modern Grid

http://jolt.law.harvard.edu/articles/pdf/v25/25HarvJLTech199.pdf

Harvard Journal of Law & Technology
Volume 25, Number 1 Fall 2011
PRIVACY AND THE MODERN GRID

"The nationwide deployment of smart meters has begun.[14] **This transition, however, brings new threats to privacy.** The smart grid's essential innovation is information.[15] From a privacy standpoint, this signature benefit is also the smart grid's Achilles' heel.[16] **Because smart meter data is highly granular, it is highly revealing.[17] Data from a smart meter can tell an observer much more about a home than the information from a more traditional meter using older technology**.[18]"

"Some electric meters and devices, despite not being "smart," may now collect information more often than once per month, increasing data granularity and potentially triggering privacy concerns. This Note recognizes this complexity but nonetheless treats smart meters as a distinct technological class for two reasons. First, smart meters are uniformly more advanced than traditional meters, and the information that smart meters generate is more refined. **Second, smart meters are only one component of the broader transition to the smart grid. This effort, in contrast with past upgrades, is intended to alter permanently the prevailing technological standard for electric meters. The technology's sophistication and its saturation are each relevant to privacy."**

III. SMART METER DATA AND THE FOURTH AMENDMENT

"The Fourth Amendment sets limits on law enforcement's investigatory powers, including its ability to obtain data.[64] Fourth Amendment protections "hinge on the occurrence of a 'search,' a legal term of art whose history is riddled with complexity.**"**[65] **Until *Katz v. United States*,**[66] **the Supreme Court generally interpreted the Fourth Amendment to be focused on guarding physical places from scrutiny and limiting the search or seizure of tangible objects.**[67]**"**

"**After *Katz*, so long as a person exhibits a subjective expectation of privacy in an object, activity, or statement, and that privacy expectation is one that society finds to be objectively reasonable, the Fourth Amendment protects it from warrantless search.**[72]**"**

64. The Fourth Amendment states:
"The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the person or things to be seized."
U.S. CONST. amend. IV.
65. Widgren v. Maple Grove Twp., 429 F.3d 575, 578 (6th Cir. 2005).
66. 389 U.S. 347 (1967). **In *Katz*, the Court cemented an expansion of Fourth Amendment protections beyond a property-based model that arguably had already begun in Warden,**
Maryland Penitentiary v. Hayden, 387 U.S. 294 (1967), *Berger v. New York*, 388 U.S. 41 (1967), and *Camara v. Municipal Court*, 387 U.S. 523 (1967).
67. *See* Silverman v. United States, 365 U.S. 505, 506–12 (1961).
68. *See* Goldman v. United States, 316 U.S. 129, 131–35 (1942).
69. *Katz*, 389 U.S. at 350–52 ("In the first place the correct solution of Fourth Amendment problems is not necessarily promoted by incantation of the phrase constitutionally protected are [What a person] seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected.").

Five People Who Want to Invade Your Smart Meter Privacy and Why

http://www.turn.org/issues/smart-meters/sm-five-people-want-invade.html

"**Imagine your health insurance going up because you never use your treadmill** or your home insurance going up because you don't actually set that fancy alarm that got you a discount."

"Law enforcement traditionally must get a search warrant to access meter data from your utility company, just like they would to search anywhere else in your home. Those protections don't apply to data revealed to third parties—such as a company that helps you monitor your energy use online or from a smart phone, or a company that makes a counter-top device to monitor energy use."

The Problems With Smart Grids

http://www.counterpunch.org/2011/03/18/the-problems-with-smart-grids/

GE is the largest manufacturer of Smart Meters in the world. It has signed contracts with CenterPoint Energy and Grid Net to deploy **WiMax-enabled radios for use in Smart Meters.** WiMax is the fourth generation network that was earmarked by the FCC and the Obama administration to bring wireless Internet to rural areas.

3) SMART GRID TRANSMUTED INTO UBIQUITOUS CITYWIDE WIFI TO SPY ON CITIZENS

California City Uses Public WIFI to Transmit Smart Grid Data

http://www.ntca.org/new-edge/data/california-city-uses-public-wifi-to-transmit-smart-grid-data

"…the Northern California city of Santa Clara, launched a new program to collect smart meter data from customers via a WiFi network. The program, called the MeterConnectSM program, operates on a "free" (emphasis added) outdoor WiFi network with coverage in about 90% of Santa Clara."

http://santaclarafreewifi.com/

"Santa Clara Free Wi-Fi provides outdoor access to the Internet in the City of Santa Clara. **The free Wi-Fi is made possible through the new advanced metering system put in place by Silicon Valley Power (SVP), the City's municipal electric utility, Called SVP MeterConnect℠, it refers to the advanced meters and the wireless technology powering SVP's upgrade to modern and secure wireless metering for its electricity customers."**

UBIQUITOUS WIFI ALLOWS FOR SPYING ON UNSUSPECTING CITIZENS THROUGH THEIR WALLS

Seeing Through Walls With a Wireless Router

http://www.popsci.com/technology/article/2012-07/seeing-through-walls-wireless-router

"In the 1930s, U.S. Navy researchers stumbled upon the concept of radar when they noticed that a plane flying past a radio tower reflected radio waves. **Scientists have now applied that same principle to make the first device that tracks existing Wi-Fi signals to spy on people through walls."**

Seattle Deactivates WIFI Spying Grid

http://www.youtube.com/watch?v=k4uw5D5KjWI

4) SMART METERS ENABLE POSSIBLE ACCESS TO PRIVATE INFORMATION ON PERSONAL COMPUTERS

Smart Grid, Smarter Home

http://www.technologyreview.com/view/422316/ces-smart-grid-smarter-home/

“General Electric has developed a complete suite of smart appliances, including a fridge, dish washer, electric oven, clothes washer, dryer, and hot water heater that all have Zigbee radios for communicating either directly with a smart meter or with the company’s Nucleus Energy Manager.”

“It uses Zigbee to talk with the smart meter, appliances, and any electric vehicle you might own, and *communicates with users via a PC or smartphone interface over WiFi.”*

The fact that these smart chips communicate with home computers or cell phones means the threat of accessing personal information on ones home or office computer or cell phone is a real one.

http://www.intel.com/support/services/smartconnect/sb/CS-033108.htm

Intel® Smart Connect Technology
Features and Requirements

Overview
Intel® Smart Connect Technology is designed to update programs by periodically waking your computer from sleep/standby mode for a short time. This function works with applications that automatically get their data from the Internet, such as Microsoft Outlook*, Microsoft Windows* Live Mail and Seesmic*.

Benefits
Intel® Smart Connect Technology automatically updates applications such as e-mail and social networks when your computer is asleep. With Intel Smart Connect Technology, you do not have to wait for your applications to update when you wake up your computer.

Features
The amount of time the feature waits to wake your computer can be set using the slider bar under the Basic tab of the user interface. The time can be set from every five minutes to every 60 minutes, the longer time between updates, the less power the feature consumes.

Intel® Smart Connect Technology automatically adjusts the update frequency if your computer battery level is dropping, or if the system temperature rises.

If your computer is equipped with an Intel® WiFi card and Intel® PROSet/Wireless Connection Utility, Intel Smart Connect Technology searches for Wi-Fi networks you have previously accessed. Your computer does not update until it recognizes a known Wi-Fi network.

Requirements
Intel® Smart Connect Technology requires features that must be built into the BIOS of your computer system. For this reason, the technology must be included in the computer system at the time of manufacture. If your computer system included Intel Smart Connect Technology, but the feature is not available, make sure that the capability is enabled in your system BIOS. Contact your system manufacturer for instructions on how to access the BIOS.

5) 5th AMENDMENT VIOLATIONS

There are at a minimum, 4 laws within the 5th Amendment that smart meters and smart grid violate:

http://www.law.cornell.edu/wex/fifth_amendment

"The Fifth Amendment of the U.S. Constitution provides, "No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service in time of war or public danger; nor shall any person be subject for the same offense to be twice put in jeopardy of life or limb; **nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation."**

The utility companies had knowledge of both heath effects and fire hazard from smart meters.

http://citizensforaradiationfreecommunity.org/wp-content/uploads/2013/06/COMPLAINT..1st_amended..LASC_..Smartmeter_Complaint_SCEA-5a.doc

Whistle blower evidence that PG@E knew of fire hazard with smart meters upon installation:

http://www.youtube.com/watch?feature=player_embedded&v=EnxIoItNUek

1) **JEOPARDY OF LIFE AND LIMB**
   Please see above statement and links.

2) **NOR SHALL BE COMPELLED IN ANY CRIMINAL CASE TO BE WITNESS AGAINST HIMSELF**
   Smart meters (a part of smart grid) compel the citizen in the dwelling or owner of the property to be an involuntary and unwitting witness against themselves by mere virtue of having the smart meter on their dwelling.

Marijuana Bust Shines Light on Utilities

http://www.postandcourier.com/article/20120129/PC1602/301299979

"A former state trooper learned that lesson when Dorchester County deputies raided his Ridgeville rental property in January 2010 and discovered a sophisticated indoor marijuana farm."

"Court papers recently filed in the case revealed that investigators were tipped off by the tenant's utility company."

Personal and granular information is available through which any law enforcement agency can take full advantage, in addition to which, in the instance of hacking, ***the smart meter can actually be made to operate as if that person was in the dwelling when they were not, thereby presenting false witness against them in the privacy of their own home or business.***

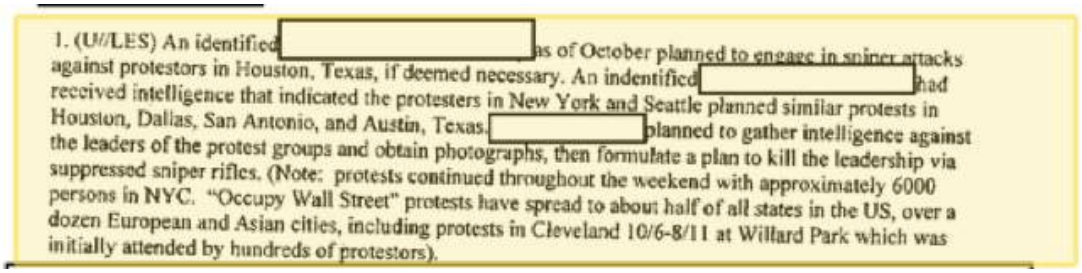
3) **NOR DEPRIVED OF LIFE, LIBERTY OR PROPERTY WITHOUT DUE PROCESS OF LAW**

As it stands, as of the new addition to "The Patriot Act" the ***NSA OR OTHER GOVERNMENT AGENCY MAY HOLD WITHOUT TRIAL INDEFINITELY AND EVEN KILL, ANY AMERICAN CITIZEN IT DEEMS TO BE A TERRORIST THREAT. CURRENTLY, ON THE LIST OF US TERRORISTS THAT WE KNOW OF ARE:***

FBI Placed Left-Wing Activists On Terrorism Watch List Without Cause

http://talkingpointsmemo.com/muckraker/fbi-placed-left-wing-activists-on-terrorism-watch-list-without-cause

https://www.documentcloud.org/documents/549518-fbi-ows-documents.html


1. (U//LES) An identified [redacted] as of October planned to engage in sniper attacks against protestors in Houston, Texas, if deemed necessary. An indentified [redacted] had received intelligence that indicated the protesters in New York and Seattle planned similar protests in Houston, Dallas, San Antonio, and Austin, Texas. [redacted] planned to gather intelligence against the leaders of the protest groups and obtain photographs, then formulate a plan to kill the leadership via suppressed sniper rifles. (Note: protests continued throughout the weekend with approximately 6000 persons in NYC. "Occupy Wall Street" protests have spread to about half of all states in the US, over a dozen European and Asian cities, including protests in Cleveland 10/6-8/11 at Willard Park which was initially attended by hundreds of protestors).

In case you can't read the above heavily redacted FOIA from the FBI regarding OWS protestors, it speaks of the FBIs plan to gather intelligence on OWS leadership, obtain photos of them and formulate a plan to kill them via suppressed sniper rifles. Disgusting as this is, the FBI has as of yet gone unpunished for this plot to kill the

people of the United States in cold blood, in addition to working to impede our vitally important Constitutional right to gather and peacefully protest. The above article shows how abusive federal governmental agencies can be against law abiding citizens and that the citizens of the United States do not trust them with our granular information, nor do we trust that the microwave emissions coming from smart meters will be used only to "relay electricity usage to the utilities".

US Terrorist Watch List:

a) ***American Friends Service Committee***
b) ***Catholic Workers***
c) ***Greenpeace USA***
d) ***Occupy Wall Street - anyone at all, ever involved in with this organization***
e) ***PETA***
f) ***Other innocent, peaceful and law-abiding citizens we do not currently have knowledge of.***

It is entirely conceivable that smart meters and smart grid can and will be used against ANYONE the NSA, DOH, DoD, CIA or other government considers a "terrorist threat and in the cases above, not only do the citizens of the US consider it illegal and abusive to have the members of those organizations placed on the terrorist list, but the fact that the NSA may indefinitely detain without trial or kill any members of the above law abiding groups and can do so with greater ease via smart meters and with possible false witness of a hacked smart meter is further evidence of a government gone rogue and a non-law abiding nation. If rule of law is not re-instated soon in the US, the smart meter could notify NSA or other government agency, law enforcement entity or "criminal" that the above listed law-abiding US citizens or other US citizens on unidentified US government "watch lists" were in their dwelling and even give granular information on the victim, which could further endanger them to indefinite detainment without trial or possible death.

4) "…NOR SHALL PRIVATE PROPERTY BE TAKEN FOR PUBLIC USE WITHOUT JUST COMPENSATION"

Smart meters operate in mesh networks, with signals hopping from one person's home or business to another, acting as communication devices for the utilities regardless of whether or not that person wants their home to be used as a relay station for the utility and without compensating the home or business owner whose property is being used by the utility as a relay station or communications hub.

6) 10th AMENDMENT

http://www.law.cornell.edu/constitution/tenth_amendment

> "The powers not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people."

Nowhere in the US Constitution does it allow the federal government to impose carcinogenic microwave devices that spy on citizens in their own home or to use their own neighborhoods for the same purposes with the same side effects.

7) 14th AMENDMENT

http://www.law.cornell.edu/constitution/amendmentxiv

> "…No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the US; nor shall any State deprive any person of life, liberty, or property, without due process of law… "

The federal government is actively abridging the privileges of U.S. citizens through the enforcement of this program, and depriving citizens of life, liberty and property.

9) FALSE AND MISLEADING CLAIMS OF JOB CREATION FOR PRIVATE CORPORATIONS TO GAIN ACCESS TO PUBLIC US TAX PAYER DOLLARS - THOSE NEWLY CREATED JOBS VIA US TAX PAYER DOLLARS ARE THEN SHIPPED OVERSEAS

Though the US is in the deepest recession since the 1930s, and more and more jobs are being shipped over seas, the federal government callously funded smart grid while pitching "job creation" to Congress so they would go along for the ride. However, the funds of course go to utility executives or manufacturers to distribute "within their company" ***whilst eliminating tens of thousands of meter reader jobs and other manufacturing jobs****.*

Dumb and Dangerous – The Problems with Smart Grids

http://www.counterpunch.org/2011/03/18/the-problems-with-smart-grids/
JOB LOSS

"According to The Wall Street Journal, Palmisano told Browner that a $10 billion investment was needed to jumpstart Smart Grids. Palmisano also claimed that Smart Grids would create 239,000 new jobs – with half of those resulting from start-up businesses. But his promise was not computed against the **jobs lost, such as hundreds of thousands of unemployed meter readers."**

Meter readers are also often the ones who spot gas leaks. They have even responded to other emergency situations on their routes. That layer of oversight is now gone.

The # 1 stated intent of ARRA (American Recovery and Reinvestment Act):

http://www.recovery.gov/About/Pages/The_Act.aspx

- **Create new jobs and save existing ones**

For those utility companies utilizing these funds, this program is in direct conflict with the above stated intent, CREATING new jobs, not eliminating them and further decimating US employment.

US CITIZEN TAX DOLLARS FREELY GIVEN TO GE (General Electric) FOR MANUFACTURING OF SMART PRODUCTS, THEN THOSE JOBS SHIPPED TO CHINA AND OTHER OVERSEAS WORK FORCES

GE Gets 2.3 Federal Energy Grants…Every Month!

http://www.instituteforenergyresearch.org/2010/10/29/ge-gets-over-2-3-federal-energy-grants-every-month/

"General Electric CEO Jeff Immelt might have been right when he called the U.S. government's energy policy "stupid" last month, but if it has been stupid, it has clearly been stupid in Immelt's favor, giving hundreds of energy grants worth **hundreds of millions of dollars to GE** over the last decade."

GE CEO Jeffrey Immelt, The Head of Obama's Jobs Council, Is Moving Jobs and Economic Infrastructure to China at a Blistering Pace

http://theeconomiccollapseblog.com/archives/ge-ceo-jeffrey-immelt-the-head-of-obamas-jobs-council-is-moving-jobs-and-economic-infrastructure-to-china-at-a-blistering-pace

"Jeffrey Immelt, the head of Barack Obama's highly touted "Jobs Council", is moving even more GE infrastructure to China."

"Apparently, this is all part of a "plan to invest about $2 billion across China" over the next few years. But moving core pieces of its business overseas is nothing new for GE. Under Immelt, **GE has shipped tens of thousands of good jobs out of the United States.** Perhaps GE should change its slogan to "**Imagination At Work (In China)**".

9) HACKING OF PERSONAL AND GRANULAR DATA RECORDED ON SMART CHIPPED DEVICES

"Made In China, Hacked By China" – International Brotherhood of Electrical Workers

Electrical Union Workers Speak Out Against Smart Meters

http://www.memphisdailynews.com/news/2013/jul/10/ibew-plans-smart-meter-billboard-protest/

"Leaders of International Brotherhood of Electrical Workers Local 1288 said Monday, July 8, they intend to put up billboards warning the public of what they say are the dangers of the new meters the utility plans to seek city funding for later this year. **"We know it can be hacked in China,"** said Donna Bohannon, another opponent of the meters. **"Made in China, hacked by China."**

There are more industry and governmental organizations speaking out on the issue of smart grid vulnerability through hacking than any other issue regarding smart meters or smart grid.

Initial Comments of North East Utilities Executive Summary

http://haltmasmartmeters.org/wp-content/uploads/2014/01/NSTAR_R12-76-Comments-7986-POSTED01172014_HIGHLIGHTED.pdf

"AMI introduces a brand new portal into the Companies' information systems, **significantly increasing the cyber-security risk."**

Power Grid Updates Left System Vulnerable to Cyber attacks, Auditors Say

http://www.washingtonpost.com/politics/power-grid-updates-left-system-vulnerable-to-cyberattacks-auditors-say/2012/02/07/gIQAMxBVxQ_print.html

"A rush by the Energy Department to use stimulus money to modernize the country's power grid has left the system vulnerable to cyberattacks, the agency's internal watchdog found."

"Inspector General Gregory H. Friedman **found "shortcomings" in the cyber security plans of more than a third of the utility companies that got federal funding for "smart grid" projects — from incomplete strategies to prevent an attack to vague steps for stopping one if it started."**

"Energy officials knew of these weaknesses but approved plans for the projects anyway, auditors said: **"The initial weaknesses had not always been fully addressed, and did not include a number of security practices commonly recommended for federal government and industry systems."**

"…the complex computer systems have caused concern about cyber attacks by hackers looking to grab personal information from utility accounts — or even shut down the nation's power grid.

"Auditors blamed the weak cybers ecurity on the rush to grant the stimulus money."

"The issues identified were due, in part, to the accelerated planning, development and deployment approach," auditors wrote.
Another shortcoming: **"The Energy Department was so focused on giving out money, it did not ensure that its staff had adequate training to oversee the projects."**

FBI: Smart Meter Hacks Likely to Spread

http://krebsonsecurity.com/2012/04/fbi-smart-meter-hacks-likely-to-spread/

"A series of hacks perpetrated against so-called "smart meter" installations over the past several years may have cost a single U.S. electric utility hundreds of millions of dollars annually,"

Ratepayers will be forced to shoulder the costs of hacking and theft of the easily infiltrated smart grid.

"The FBI says…"expects this type of fraud to spread across the country as more utilities deploy smart grid technology."

"The FBI warns that insiders and individuals with only a moderate level of computer knowledge are likely able to compromise meters with low-cost tools and software readily available on the Internet."

"The FBI says…former employees of the meter manufacturer and employees of the utility were altering the meters in exchange for cash and training others to do so. "These individuals are charging $300 to $1,000 to reprogram residential meters, and about $3,000 to reprogram commercial meters."

When Smart Homes Get Hacked: I Haunted a Complete Strangers House Via the Internet

http://www.forbes.com/sites/kashmirhill/2013/07/26/smart-homes-hack/

"I can see all of the devices in your home and I think I can control them," I said to Thomas Hatley, a complete stranger in Oregon who I had rudely awoken with an early phone call on a Thursday morning…" "…I flipped the light switch with a click, and resisted the Poltergeist-like temptation to turn the television on as well." "They just came on and now they're off," he said.

"You could put someone's electric bill through the roof by turning on a hot tub heater," says Bryan.

Hacking For Privacy: 2 Days for Amateur Hacker to Hack Smart Meter, Fake Readings

http://www.networkworld.com/community/node/79486

"Hackers analyzed Smart Meter data and were able to identify the number of PCs or LCD TVs in a home, what TV program was being watched, and if a DVD movie being played had copyright-protected material."

Privacy Rights Activists Worry About Potential Abuse of High Tech Gadgets Featured at CES Event

http://www.washingtonpost.com/business/economy/privacy-rights-activists-worry-about-potential-abuse-of-high-tech-devices-featured-at-ces-event/2012/01/10/gIQAX3kJpP_story.html

"Microsoft's Kinect game console collects some biometric information that Chief Executive Steve Ballmer said on Monday is a potential springboard for health-care and other industries. "We are collecting data second by second, "said Tivo Senior Vice President Tara Maitra. LG was among several companies to showcase "connected homes, "where appliances are connected to one another as well as energy grids via the Web."

Dumb and Dangerous – the Problems with Smart Grids

http://www.counterpunch.org/2011/03/18/the-problems-with-smart-grids/

"Smart Grids can be penetrated by both wired and wireless networks. In August of 2009, hackers robbed 179,000 Toronto Hydro customers' names, addresses, and billing information from their e-billing accounts. Security consultant Mike Davis of IOActive, Inc/Seattle has shown **how easy it is to install computer worms that can take over the whole grid, and such worms can be programmed to alter billing information, gather information on electricity use for sale to third parties, or shut down hundreds of thousands of households."**

"Ross Anderson and Shailendra Fuloria at Cambridge University's Computer Laboratory note that **hostile government agencies or terrorist organizations could bring whole countries to their knees by interrupting electrical generation. More so than traditional grids, they stress that Smart Grids create a new strategic vulnerability as the cyber equivalent of a nuclear attack. Smart Grids are also easy to sabotage with simple jamming devices."**

"…encryption often fails. Imagine the utility – or even a passing cell-phone user – inadvertently turning on your oven when you're on vacation. Or shutting off the furnace on a subzero night. For insurance purposes, who is liable? **What about civil rights violations? Or the legal ramifications of a utility partnering with the police?** In the purest sense, Smart Grids offer new opportunities for electronic trespass."

Smart Meters Not So Clever About Privacy Researchers Find

http://www.pcworld.idg.com.au/article/441028/smart_meters_clever_about_privacy_researchers_find/

"Researchers at the University of South Carolina have discovered that some types of **electricity meter are broadcasting unencrypted information that, with the right software, would enable eavesdroppers to determine whether you're at home."**

Ember Needs A Wake-Up Call From The CIA

http://www.forbes.com/sites/jeffreycarr/2011/01/31/ember-needs-a-wake-up-call-from-the-cia/

"Ember Corporation, a privately-held company based in Boston, MA with offices in the U.K. and China (Hong Kong) is a leading supplier of the "brains" of Smart Grid devices – semiconductor chips that enable the smart meter on your house to wirelessly send data about your power consumption to your power grid provider. It also allows your power company to control the supply of energy to every house in its service area up to and including a complete disconnection of service. It does this through a wireless communications protocol that you've probably never heard of called Zigbee."

"…Ember Corporation caught the attention of In-Q-Tel, the venture capital arm of the CIA back in 2005."

"Here's how In-Q-Tel describes the company and its services:"

"Ember's vision is to help create an "Internet of things" by enabling the eight billion microcontrollers built into products each year to support low-cost, low-power networking applications in any industry."

"The encryption keys that provide for Zigbees's vaunted security are transmitted in plain text. **That's the equivalent of using the word "password" as your password."** "…**ZigBee stack for the chip is still vulnerable to this attack, even after recent patches!** A year later, exactly two debugger commands are all that are required to extract keys from nearly every ZigBee SEP device with a Chipcon radio, and no one knows to patch their code! (Do not be smug if you are an Ember customer. The EM2xx chips are un-patch-ably vulnerable to debugger key extraction, and there is no mention of this in the chip's errata sheet either.)"

"We're talking about critical infrastructure here. For companies like Eber and Texas Instruments to simply ignore the repeated warnings of respected security researchers like Travis, Josh, Nick D and others is, in my opinion, disgraceful

behavior. And while I'm not a lawyer, if harm is caused to a power company's customers because this well-known and well-publicized flaw was finally exploited by bad guys, I'd bet the mother of all class action lawsuits would be waiting on deck."

Smart Grid Cyber Security: DHS Reports Vulnerability in RuggedCom's Software

http://www.greentechmedia.com/articles/read/smart-grid-cybersecurity-dhs-reports-vulnerability-in-ruggedcoms-software

"Another day, another **cybersecurity flaw revealed in the IT systems that run the world's critical infrastructure** -- and this time, the Department of Homeland Security is getting involved."

"This isn't the first alert from the DHS' Industrial Control Systems Computer Emergency Response Team (ICS-CERT). **The federal agency tagged what turned out to be a SCADA system employee logging on from Russia as a potential foreign attack on an Illinois water utility last year. ICS-CERT reported a total of 90 vulnerabilities so far this year, up from 60 in 2011."**

New Interest in Hacking as Threat to US Security

http://www.nytimes.com/2012/03/14/us/new-interest-in-hacking-as-threat-to-us-security.html?_r=1

"James A. Lewis, a senior fellow and a specialist in computer security issues at the Center for Strategic and International Studies, a policy group in Washington, said that **as hacking awareness had increased, attacks had become more common. He said that the attacks on the nation's infrastructure were particularly jarring."**

"He added: "**We hit rock bottom on this in 2010. Then we hit rock bottom in 2011. And we are still at rock bottom. We were vulnerable before and now we're just more vulnerable. You can destroy physical infrastructure with a cyberattack just like you could with a bomb."**

How hackers can steal electricity from smart grid

A video lesson…

http://www.youtube.com/watch?v=wGzZG7IWfYo

Hacking Expert David Chalk Joins Urgent Call to Halt Smart Grid

http://apps.fcc.gov/ecfs/document/view?id=7520940126

"The vulnerability of the energy industry's new wireless smart grid will inevitably lead to lights out for everyone, according to leading cyber expert David Chalk. In an online interview for an upcoming documentary film entitled 'Take Back Your Power' (www.ThePowerFilm.org), Chalk says the entire power grid will be at risk to being taken down by cyber attack, and if installations continue it's only a matter of time. "

"We're in a state of crisis," said Chalk. "The front door is open and there is no lock to be had. There is not a power meter or device on the grid that is protected from hacking - if not already infected - with some sort of Trojan horse that can cause the grid to be shut down or completely annihilated."

"Every endpoint [meter] is a new potential threat vector," according to Doug Powell, manager, SMI Security, Privacy & Safety, for Canadian utility BC Hydro.

Senators Debate Security of Electric Grid

http://www.washingtontimes.com/news/2012/jul/17/senators-debate-security-electricity-grid/

"The U.S. electricity grid is dangerously vulnerable to sabotage by hackers, spies and terrorists, despite a seven-year effort to protect it from cyberattacks, senators and officials said Tuesday."

"Set up by the 2005 Energy Policy Act, **the system is "not adequate" for protecting the huge and complex power network from an attack via the Internet, the New Mexico Democrat said."**

"Seven years after we passed the law … we are still waiting for that process to produce the full set of adequately protective standards that we need," Mr. Bingaman said."

Cyber Security: Power Grid Grows More Vulnerable to Attack, Report Finds

http://www.csmonitor.com/USA/2011/1206/Cyber-security-Power-grid-grows-more-vulnerable-to-attack-report-finds

"Millions of new communicating electronic devices ... will introduce attack vectors -- paths that attackers can use to gain access to computer systems or other communicating equipment. That increase[s] the risk of intentional and accidental communications disruptions," including "loss of control over grid devices, loss of communications between grid entities or control centers, or blackouts."

Utility Cyber Security is in a State of Near Crisis

http://www.pikeresearch.com/research/utility-cyber-security

"**Utility cyber-security is in a state of near chaos….Many attacks simply cannot be defended."**

SCADA Systems Vulnerability Is Key Weakness in Smart Grid Deployments

http://www.homelandsecuritynewswire.com/dr20111212-scada-systems-vulnerability-key-weakness-in-smart-grid-deployments

Homeland Security Newswire:

"SCADA systems' vulnerability (is) key weakness in Smart Grid deployments…"

"Many SCADA systems were deployed without security in the belief that SCADA would always be isolated from the Internet," says senior analyst Bob Lockhart. "But it's not, and even when it is, attacks such as Stuxnet can circumvent the isolation by using USB memory sticks to spread.

"Hackers also analyzed Smart Meter data and were able to identify "the number of PCs or LCD TVs in a home, what TV program was being watched, and if a DVD movie being played had copyright-protected material."

CIA Director, Leon Panetta Warns of Cyber Pearl Harbor

http://abcnews.go.com/News/cia-director-leon-panetta-warns-cyber-pearl-harbor/story?id=12888905

"I've often said that there's a strong likelihood that the next Pearl Harbor that we confront could very well be a cyber attack that cripples our power systems, our grid."

Leon Panetta: Cyber intruders have already infiltrated US systems

http://usnews.nbcnews.com/_news/2012/10/11/14376572-panetta-cyber-intruders-have-already-infiltrated-us-systems?lite

"In a speech before business executives in New York, Panetta revealed that cyber intruders have already gained access to some of America's critical control systems that run chemical, electric and water systems with the intent to "cause panic, destruction and loss of life."

Former CIA Director James Woolsey:

https://www.youtube.com/watch?v=MAid1bS8t9U

"What they're doing now, they're constructing what they call a 'Smart Grid.'… And a so-called 'Smart Grid' that is as vulnerable as what we've got is not smart at all, it's a really, really stupid grid."

How to Hack the Power Grid for Fun and Profit

http://www.technologyreview.com/news/421112/how-to-hack-the-power-grid-for-fun-and-profit/

"Attackers could manipulate power-grid data by breaking into substations and intercepting communications between substations, grid operators, and electricity suppliers. This data is used by grid operators to set prices for electricity and to balance supply and demand, the researchers say. **Grid hackers could make millions of dollars at the expense of electricity consumers by influencing electricity markets. They could also make the grid unstable, causing blackouts."**

"The attacks would be difficult to trace", Le Xie, an assistant professor of electrical and computer engineering at Texas A&M University, speaking at the IEEE SmartGridComm2010 conference in Gaithersburg, Maryland.

"Deepa Kundur, a professor of electrical and computer engineering at Texas A&M, is developing simulations to help determine the risks involved. **"It's not yet clear whether the smart grid will be worth the risks."**

Behave Yourself! The Utilities Have Got Your Numbers and Next They'll Know Your Habits Too!

http://smart-grid.tmcnet.com/topics/smart-grid/articles/176270-behave-yourself-utilities-have-got-numbers-next-theyll.htm

"GridGlo is working with utilities to combine consumer household behavioral data with energy usage data—along with a dollop of data on weather, demographics, motor vehicle registrations, and even satellite imagery—and from all that, to draw strategic operational and marketing conclusions. The process is called data fusion. Behave Yourself! The Utilities 'Have Got Your Numbers' and Next They'll Know Your Habits, Too."

Hacking Water Meters Is Easier Than It Should Be

http://venturebeat.com/2011/08/06/hacking-water-meters-is-easier-than-it-should-be/

"If people want to reduce their water bills, they could hack the sensors. They could also increase the bill paid by a neighbor they don't like, or evade restrictions on the amount of water used. And since the usage of water indicates the presence or absence of the homeowner, the hacked water meters can be used for surveillance purposes."

SmartMeters Facilitate Cyber War Against US

http://daviddilworth.com/pol/smartmeters-facilitate-cyber-war-against-us/

"Smart" meter communication data is in "plain English" — it is **readable by anyone with a laptop and WiFi. This means your so-called "Smart"meter is easily controlled by anyone with a laptop and a WiFi. Is this a wild speculative fantasy? No."**

Smart Meter Hacking Tool Released

www.zdnet.com/smart-meter-hacking-tool-released-7000001338/

"As with any release of a hacking tool, there are two sides of the same…"

"Termineter can also be used maliciously to modify consumer data, inflicting financial loss on one or multiple victims."

FBI Finds Smart Meter Hacking Surprisingly Easy

http://www.greentechmedia.com/%20articles/%20read/%20fbi-finds-smart-meter-hacking-surprisingly-easy

"…But for at least one utility in Puerto Rico**, smart meter hacking may have cost the utility hundreds of millions of dollars, according to the Federal Bureau of Investigation,** as reported on the blog Krebs on Security."
"The security blog obtained a May 2010 cyber intelligence bulletin that said the incident is the first known report of criminals hacking into smart meters and that this **is just the beginning of this type of activity**.

David Chalk on Smart Meter Hacking - Part 1

https://www.youtube.com/watch?v=txwBQpiQxy0

Hacking Expert David Chalk Joins Urgent Call to Halt Smart Grid

http://www.businesswire.com/news/home/20120412005992/en/Hacking-Expert-David-Chalk-Joins-Urgent-Call#.UzkEc8fsvyw

"100% certainty of catastrophic failure of energy grid within 3 years," says security expert David Chalk."

"The front door is open and there is no lock to be had. There is not a power meter or device on the grid that is protected from hacking - if not already infected - with some sort of Trojan horse that can cause the grid to be shut down or completely annihilated… This could actually be worse than a nuclear war, because it would happen everywhere. How governments and utilities are blindly merging the power grid with the Internet, and effectively without any protection, is insanity at its finest.""

10) HACKING MEDICAL IMPLANTS

What could be worse than having your home or the entire grid hacked? Having your medical implant hacked. This could cause instant death. Millions of Americans are at risk. FCC and other government agencies, are WELL AWARE of this risk, including ex vice president Dick Cheney:

Dick Cheneys Fear Heart Device Hacks Justified

http://abcnews.go.com/Health/dick-cheneys-fear-heart-device-hacks-justified-experts/story?id=20633284

Black Hat Hacker Can Remotely Attack Insulin Pumps and Kill People

http://www.cbsnews.com/news/black-hat-hacker-can-remotely-attack-insulin-pumps-and-kill-people/

"Radcliffe wears an insulin pump that can be used with a special remote control to administer insulin. **He found that the pump can be reprogrammed to respond to a stranger's remote."**

"Although an attacker would need to be within a couple hundred feet of the patient to pull this off, a stranger wandering a hospital or sitting behind a target on an airplane would be close enough…**With a powerful enough antenna, Radcliffe said, an attacker could be up to a half a mile away."**

"It would only take one person to do this to kill someone and then you have a catastrophe," he said."

Black Hat Lethal Hack and Wireless Attack on Insulin Pumps

http://blogs.computerworld.com/18744/black_hat_lethal_hack_and_wireless_attack_on_insulin_pumps_to_kill_people

"Dr. William Maisel, assistant professor at Harvard Medical School: **"…if a medical device embedded in the body were to glitch out, seemingly malfunction and cause a target's death, who would think to look at it as a long-range wireless assassination which left no smoking gun?"**

Watch Where You're Beaming That Signal

www.startribune.com/opinion/commentary/22122349.html

"In January 2006, I had my "battery-operated brain," also known as BOB, installed. What I mean is that I underwent two surgeries to have lead wires with electrodes implanted deep into my brain, which were then hooked up to neurotransmitter "pacemakers" in my chest."

"Last October, I began having dyskinesia on my left side. I hadn't changed my medication. I couldn't figure out what might be causing it. Many phone calls, several hundred dollars in plane fare to see my neurosurgeon in Cleveland, numerous X-rays and a long session with a programmer revealed that ***something*** **had caused the neurostimulator on my right side, which controls the left side of my body, to be reset to factory settings.** The left neurostimulator had maintained its programmed settings. My neurosurgeon said he knew of only two ways this could have happened: equipment failure (which seemed unlikely, because the device was reprogrammed and, within an hour, I felt fine) **or exposure to a large source of electromagnetic interference.** But I always go out of my way to avoid known sources of EMI. So what could it have been?"

There is NO avoiding smart grid or smart meters. People like the person above will most likely die from smart grid roll out. The US government along with utilities may be held accountable for these deaths.

Finding Wireless Solutions for Connected Healthcare at MD&M 2013

http://www.rfm.com/rfm-and-murata/medical-wireless/

"What do design engineers for a pacemaker, a patient monitoring system, and diagnostic equipment all have in common? These days, **they all have to implement wireless connectivity into their designs."**

Letter From Dr. Martin C. Burke, DO

http://interchange.puc.state.tx.us/WebApp/Interchange/Documents/40190_621_736027.PDF

Control Number
40190
Item Number: 621
Addendum StartPage
SECTION OF CARDIOLOGY
.5S4I SOUTH MARYLAND AVENUE • MC 6080 • CHICAGO • ILLINOIS 60637-1470
(773) 702-1757

30 April 2012

Douglas Krieger,
City Manager
City of Naperville
400 E. Eagle St.
Naperville IL 60540-5279

Martin C. Burke, DO
Interim Chief, Section of Cardiology
Director, Heart Rhythm Center
The University of Chicago Medicine
5758 S. Maryland Avenue, MC 9024
Chicago IL 60637

Mr. Krieger:

It has come to my knowledge that one of my patients is being forced to receive the 'smart' meters being installed in your city. Because of the sensitive condition of her heart and potential for interference of the new devices, it is my expert medical opinion that her household not receive the 'smart' meter. The potential complications or interferences are not acceptable with her device. There is potential that this meter may interfere with the function of her cardiac device; this could cause a number of issues including but not limited to inappropriate shocks, cardiac device reprogramming and/or asynchronous pacing. Until more reliable data can be collected on the health and safety of these 'smart' meters, it is not recommended that she has one of these installed in her home.
Please let me know if you have any questions. You may contact my office at 773-702-5988.
Thank you
Martin C. Burke, DO

A Few Quotes From Dr. Zory Glaser

http://www.magdahavas.com/category/from-zorys-archive/

By Dr. Zory Glaser:
Microwave
Radiation
Affects the Heart
March 7, 2011.

“We know that pace makers can malfunction if they are exposed to interfering microwave frequencies and people with pace makers are told to stay away from microwave ovens and other microwave emitting devices. The newer pace makers have shielding to prevent interference. But the human heart comes without a shield. So it is not only the child or adult with a pace maker that needs to be careful about their exposure to microwaves, all of us need to be aware that this radiation may affect the heart.”

"Thus, long-term observations showed that the nature and intensity of the cardiovascular reactions to prolonged exposure to microwaves are closely related to neurologic changes, especially those in the autonomic nervous system.”

“The early literature showing cardiovascular dysfunction among microwave workers, our study showing heart rate irregularities with pulsed microwave exposure at a fraction of international microwave exposure guidelines; the complaints of electrically hypersensitive individuals of heart irregularities; student complaints of heart flutters and a racing heart; and the increase in the rate of sudden cardiac arrest among young people to the point that schools are installing
defibrillators cannot be ignored.”

11) “SMART ZIGBEE CHIPS” INTERACTING WITH MEDICAL IMPLANTS

If the question is can medical implants be interacted with or hacked, the overwhelming answer is a resounding YES when both the FDA and hackers were asked. Smart grid and smart meters send extremely powerful pulses or blasts of RF microwave radiation into the home or other areas people inhabit, including the street. An overwhelming number of plaintiffs in the CA lawsuits against smart meters and smart grid sight heart arrhythmia, heart attack and medical implant interference as some of the health effects they suffered from smart meters and smart grid. Some of

these plaintiffs have pace makers or defibrillators that they believe is also interacting with the smart grid. Their beliefs are well founded when looking at the warnings the FDA and hackers are issuing. These people live in fear that the smart grid will shut their equipment off or make it go haywire in some life threatening way. Smart meters and smart grid can actually kill people with medical devices more quickly than others.

US Warns of Cyber Attacks on Medical Devices

http://www.rawstory.com/rs/2013/06/13/u-s-warns-of-cyber-attacks-on-medical-devices/

"US authorities on Thursday warned makers of medical devices and hospital networks to step up efforts to guard against potential cyber attacks."

"The US Food and Drug Administration said implanted devices, which could include pacemakers or defibrillators, could be connected to networks that are vulnerable to hackers."

"It said the agency has recently "become aware of cybersecurity vulnerabilities and incidents that could directly impact medical devices or hospital network operations."

"These devices or systems could be compromised "by the introduction of malware into the medical equipment or unauthorized access to configuration settings in medical devices and hospital networks," the FDA said."

Hacker Barnaby Jack Dies Days Before Revealing His Pacemaker Exploit: One Last Interview

http://motherboard.vice.com/blog/one-last-interview-with-barnaby-jack

The below hacker was "found dead" right before he was scheduled to deliver a speech on how to kill pace maker and other wireless device implanted patients via hacking. Indeed, no hacking is necessary when it comes to smart girds interference with pace makers and many other wireless medical implants. Some of the plaintiffs in the CA lawsuits are themselves pace maker patients who have suffered this smart meter and smart grid interference first hand. Below are excerpts from one of the last interviews of hacker, Barnaby Jack.

"Barnaby Jack, the director of embedded device security for computer security firm IOActive, developed software that allowed him to remotely send an electric shock to anyone wearing a pacemaker within a 50-foot radius. He also came up with a system that scans for any insulin pumps that communicate wirelessly within 300 feet, allows you to hack into them

without needing to know the identification numbers and then sets them to dish out more or less insulin than necessary, sending patients into hypoglycemic shock."

"Having your heart wirelessly hacked and set to explode at 830 volts could be viewed as a bit of a setback if you're considering getting a pacemaker fitted."

"…the software I developed allows the shutting off of the pacemaker or ICD, reading and writing to the memory of the device and, in the case of ICDs, it allows the delivering of a high voltage shock of up to 830 volts."

"…we had previously looked at insulin pumps and we found a severe vulnerability in the most popular model."

CA Plaintiff Lou Donovan On Defibrillator Shut Off After Smart Meter Installation

Heart and Pacemaker Disruption After Smart Meter Installation

Starts at around 6:15
https://www.youtube.com/watch?feature=player_embedded&v=BRDhogkdxW4

12) SMART GRID ENABLES CATASTROPHIC, MULTIPLE NUCLEAR FACILITY MELTDOWNS BASED ON EASIER ACCESS TO HACKING AND TERRORISM ATTACK

Nuclear reactors depend on external electrical power for their energy requirements.

White House and NRC Recommend 50 Mile Fukushima Evacuation, Yet Insist US Safe with Only 10

https://www.youtube.com/watch?v=xMcj1mnD2PE

Photograph, lower torso of child of Chernobyl aftermath.

"…the most likely type of **a nuclear accident is caused by a loss of offsite power**. That is what happened at Fukushima: the power system AROUND the plant broke down."

"But remember the most likely cause of a nuclear accident is loss of offsite power and that has NEVER been part of an emergency plan, assuming that all of that does not work."

"If power is disconnected to these facilities, from whatever cause, generators must be relied on instantly to function. Energy must be available constantly to keep fuel rods and reactor cores cool."

"A failure In this system, a failure in being able to shut down a reactor safely, could result in a nuclear disaster at each and every nuclear reactor, not just in California, but across the United States, affecting all of us."

"That would create Fukushimas many times over."

A page from the notebook of an Emergency Diesel Generator expert, R.D. Jacobs, hired to monitor a test for a nuclear reactor's back-up cooling system…

"This is to record that on my last visit,….I pressed [a company executive] saying that we just did not know what the axial vibration of the crankshaft was doing to the [diesel] units. I was unable to impress him sufficiently."

"The diesels were "tested" by turning them on for a few minutes at low power. They worked fine. But R.D., a straight shooter, suspected problems. He wanted the motors opened and inspected. He was told by power company management to go to hell."

"When we forced the plant builder [in Suffolk County, New York] to test the three Emergency Diesel Generators in emergency conditions, one failed almost immediately (the crankshaft snapped, as R.D.[Jacobs} predicted), then the second, then the third. We named the three diesels "Snap, Crackle, and Pop."

"…I knew that all these diesels were basically designed, or even taken from, cruise ship engine rooms or old locomotives. I'm not an engineer, but I suspect a motor designed for a

leisurely float in Bermuda is not fit for a life-and-death scramble. So, I asked [an industry insider], “They really can’t work at all, the diesels, can they?”

“That’s when he introduced me to the phrase “crash start.”

“On a ship, he explained, you would take half an hour to warm up the bearings, and then slowly build up to “critical” crankshaft speed, and only then add the “load.” the propeller…”

“Worse, to avoid having to buy additional diesels, the nuclear operators turbo-charge them, revving them to 4,000 horsepower in ten seconds when they are designed for half that output.”

“The result: snap, crackle, pop.”

“I learned that, at Fukushima, at least two of the diesels failed before the tsunami hit. What destroyed those diesels was turning them on. In other words, the diesels are junk, are crap, are not capable of getting up to full power in seconds, then run continuously for days….”

”So, you saying emergency diesels can’t work in an emergency?”

“Actually, they’re just not designed for it.”

Excerpt from “Vulture’s Picnic”, by Greg Palast, p. 294-297

This is the present system in place to protect all of us in case of a power outage to nuclear reactors.

Former NRC Chairman Gregory Jaczko: need link

“The events at Fukushima reinforce that any nuclear accident with public health and safety or environmental consequences of that magnitude, is inherently unacceptable. But we focused on the radiological consequences of this event. I believe we cannot ignore the large social and economic consequences such an event poses to any country with a nuclear facility that deals with such a crisis.”

“In Japan, more than 90,000 people remain displaced from their homes and land, with some having no prospect for a return to their previous lifestyle in the foreseeable future. While not easy to characterize, these are significant hardships on these people and they are inherently unacceptable. So as we look to the future and we look in a proactive way, we ultimately will have to address the issue of how do we deal with nuclear events that lead to significant land contamination. And displacement, perhaps permanently, of people from their homes and their livelihoods and their communities.”

http://scienceblogs.com/gregladen/2008/04/26/meltdown-at-chernobyl-nuclear/

Arne Gunderson:

“What you have just heard was the Nuclear Regulatory Commission's chairman, Gregory Jaczko, saying that the NRC does not take in to account mass evacuations and people not getting back on their land for centuries when it does a “cost benefit” analysis as to whether or not a nuclear plant should be licensed.”

Please watch the below video from Fairewinds, Arne Gunderson on this issue of cost analysis not including human and environmental heath and safety and how this is always a large part of the financial equation in energy infrastructures but is never actually included in the cost analysis reports:

PLEASE NOTE, FAIREWINDS HAS CHANGED THE LINK LOCATIONS ON THEIR SITE. THE BELOW LINK DOES NOT WORK, CORRECTED LINK FORTHCOMING...

http://fairewinds.org/media/fairewinds-videos/tokyo-soil-samples-would-be-considered-nuclear-waste-in-the-us

Nor is human and environmental hazard, heath and safety taken into account when considering the “cost benefit” analysis of a smart grid.

Video on the after life of the Chernobyl nuclear event.

Meltdown at Chernobyl

http://scienceblogs.com/gregladen/2008/04/26/meltdown-at-chernobyl-nuclear/

13) LIFE THREATENING AND DEBILITATING HEALTH EFFECTS INCLUDING CANCER, MANY NEUROLOGICAL ILLNESSES, PERMANENT GENETIC ALTERATION TO LINEAGE AND ADS (ADULT SUDDEN DEATH SYNDROME) VIA HEART ATTACK FROM MICROWAVE PULSES FROM SMART GRID AND SMART METER EMISSIONS

The range of health effects from smart meters and smart grid is no mystery to many of our federal government agencies such as DOD, CIA, NSA, DHS, DOE, and probably many other agencies as this microwave radiation is the exact same kind of microwave radiation, even sometimes in the same frequency bandwidth that is used by our military as weapons on the battlefield, for crowd control and even have been used by MK ULTRA and other nefarious government agency operations, all with the primary goal of debilitating, controlling, destabilizing in some way, or killing the enemy. But these microwave emissions are also used in medicine to heal bone fracture and are even in the early stages of being used to cure cancer. There is no doubt in anyone's mind that these emissions have an enormous impact on human and environmental biology…no one's mind except the average citizen who trustingly believes everything their federal agencies such as the FDA and FCC tell them about this radiation, that there are NO health effects whatsoever from microwave emissions…a bold and blatant lie.

The evidence of health effects is overwhelming, when looking at independent studies on this issue, but even the biased, industry funded studies show increase in cancer.

Below are a list of symptoms associated with EMF exposure, some documentary films made on this issue, as well as just SOME of the overwhelming scientific evidence of harm from smart meter and other non ionizing, non thermal radiation that the industry and our government deem to be "safe".

List of Symptoms Associated with RF and EMF Exposure

ADD/ADHD
Arthritis, body pain, sharp, stabbing pains
Asthma
Birth Defects
Cancer
Cataracts
Cardiac symptoms, heart palpitations, heart arrhythmias, chest pain
Changes in menstrual cycle
Concentration, memory or learning problems
Cough
Disorientation, dizziness, or balance problems

Endocrine disorders,
Eye problems, including eye pain, pressure in the eyes,
Exacerbation of Pre-existing Conditions
Diabetes
Fatigue, muscle or physical weakness
Headaches, sharp pain or pressure in the head
Heart Attack
High blood pressure
Hyperactivity or changes in children's behavior
Leg cramps, or neuropathy
Leukemia
Lymphoma
Medical Implant Interference and Malfunctions Including Defibrillator Shut Off, Deep Brain Stimulator Shut Off, Insulin Pump Malfunctions
Nausea, flu-like symptoms
Neurological Illness Including Parkinsons, ALS, Dementia, Multiple Sclerosis,
Nose bleeds Skin rashes, facial flushing
Pre-cancerous cells,
Recurrence of cancer
Reproductive Problems
Respiratory problems,
Ringing in the ears, ear pain, high pitched ringing, stabbing pains in the ear
Seizures
Sinus problems,
Sleep problems (insomnia, difficulty falling asleep, night waking, nightmares)
Stress, agitation, anxiety, irritability
Spontaneous Abortion
Thyroid problems
Urinary problems

Some Very Important Films on This Subject

Take Back Your Power
http://www.takebackyourpower.net/

Resonance, Beings of Frequency
http://www.youtube.com/watch?v=QV9dhGv_tTs

Full Signal
http://fullsignalmovie.com/

Other Very Important Videos on Smart Meters, EMFs, Dirty Electricity and Health Effects:

CA Smart Meter/Smart Grid/Health Effects Law Suits Against Edison and PG@E
http://www.youtube.com/watch?v=1Vln-uuu_aI

CA Plaintiff, Louis Donovan On Smart Meter Pulses, Heart Attack and Defibrillator Shut Offs
http://www.youtube.com/watch?feature=player_embedded&v=BRDhogkdxW4

Dr. David Carpenter On Smart Meters and Health Effects
http://www.youtube.com/watch?feature=player_embedded&v=n7L21XOC2wA

Dr. Sam Milham on Dirty Electricity and Smart Meters
http://www.youtube.com/watch?v=ci5GGqEPecE

General Must Watch Educational Smart Meter/Smart Grid Videos

Rob States Explains Smart Meters
http://www.youtube.com/watch?feature=player_embedded&v=FLeCTaSG2-U

This Video Measure Smart Meter Pulses
http://www.youtube.com/watch?feature=player_embedded&v=uRejDxBE6OE

American Academy of Environmental Medicine Statement on Wireless Smart Meters

http://tinyurl.com/kwxn8yg

American Academy of Environmental Medicine

6505 E Central • Ste 296 • Wichita, KS 67206
Tel: (316) 684-5500 • Fax: (316) 684-5709
www.aaemonline.org

Wireless Smart Meter Case Studies

Founded in 1965 as a non-profit medical association, the American Academy of Environmental Medicine (AAEM) is an international organization of physician and scientists interested in the complex relationship between the environment and health.

AAEM physicians and physicians world-wide are treating patients who report adverse, debilitating health effects following the installation of smart meters, which emit electromagnetic frequencies (EMF) and radiofrequencies (RF).

The peer reviewed, scientific literature demonstrates the correlation between EMF/RF exposure and neurological, cardiac, and pulmonary disease as well as reproductive disorders, immune dysfunction, cancer and other health conditions. The evidence is irrefutable. Despite this research, claims have been made that studies correlating smart meter emissions with adverse health effects do not exist.

The AAEM has received a case series submitted by Dr. Federica Lamech, MBBS, *Self-Reporting of Symptom Development from Exposure to Wireless Smart Meters' Radiofrequency Fields in Victoria*. AAEM supports this research. It is a well documented 92 case series that is scientifically valid. It clearly demonstrates adverse health effects in the human population from smart meter emissions.

The symptoms reported in this case series closely correlate not only with the clinical findings of environmental physicians, but also with the scientific literature. Many of the symptoms reported including fatigue, headaches, heart palpitations, dizziness and other symptoms have been shown to be triggered by electromagnetic field exposure under double blind, placebo controlled conditions. Symptoms in this case series also correlate with the Austrian Medical Association's Guidelines for the Diagnosis and Treatment of EMF Related Health Problems.

It is critically important to note that the data in this case series indicates that the "vast majority of cases" were not electromagnetically hypersensitive until *after* installation of smart meters. Dr. Lamech concludes that smart meters "may have unique characteristics that lower people's threshold for symptom development".

This research is the first of its kind, clearly demonstrating the correlation between smart meters and adverse health effects.

Based on the findings of this case series, AAEM calls for:

- Further research regarding smart meter health effects
- Accommodation for health considerations regarding smart meters.
- Avoidance of smart meter EMF/RF emissions based on health considerations, including the option to maintain analog meters.
- A moratorium on smart meters and implementation of safer technology
- Physicians and health care providers to consider the role of EMF and RF in the disease process, diagnosis and treatment of patients.

Passed by the Board of Directors of the American Academy of Environmental Medicine October 23, 2013

Please note: Smart Meter case series research to be released upon publication

American Academy of Environmental Medicine, Smart Meters and Health Effects Advisory:

aaemonline.org/pressadvisoryemf.pdf

American Academy of Environmental Medicine

6505 E Central • Ste 296 • Wichita, KS 67206
Tel: (316) 684-5500 • Fax: (316) 684-5709
www.aaemonline.org

Press Advisory
April 12, 2012

Contact Information:
Dr. Amy L. Dean, D.O.
President-Elect
American Academy of Environmental Medicine
(734)213-4901
environmentalmed@yahoo.com
@dramydean

The American Academy of Environmental Medicine Calls for Immediate Caution regarding Smart Meter Installation

Wichita, KS- The American Academy of Environmental Medicine today released its position paper on electromagnetic field (EMF) and radiofrequency (RF) health effects calling for immediate caution regarding smart meter installations. Citing several peer-reviewed scientific studies, the AAEM concludes that "significant harmful biological effects occur from non-thermal RF exposure" showing causality. The AAEM also expresses concern regarding significant, but poorly understood quantum field effects of EMF and RF fields on human health.

"More independent research is needed to assess the safety of 'Smart Meter' technology," said Dr. Amy Dean, board certified internist and President-Elect of the AAEM. "Patients are reporting to physicians the development of symptoms and adverse health effects after 'Smart Meters' are installed on their homes. Immediate action is necessary to protect the public's health."

Dr. William J. Rea, past president of AAEM says, "Technological advances must be assessed for harmful effects in order to protect society from the ravages of end-stage disease like cancer, heart disease, brain dysfunction, respiratory distress, and fibromyalgia. EMF and wireless technology are the latest innovations to challenge the physician whose goal is to help patients and prevent disease." Rea, a thoracic and cardiovascular surgeon and environmental physician adds, "A more thorough review of technological options to achieve society's worthwhile communications objectives must be conducted to protect human health."

The AAEM calls for:

- Immediate caution regarding "Smart Meter" installation due to potentially harmful RF exposure
- Accommodation for health considerations regarding EMF and RF exposure, including exposure to wireless "Smart Meter" technology
- Independent studies to further understand health effects from EMF and RF exposure

World Health Organization Statement on Electromagnetic Radiation and Cancer:

http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf

International Agency for Research on Cancer

World Health Organization

PRESS RELEASE N° 208 31 May 2011

IARC CLASSIFIES RADIOFREQUENCY ELECTROMAGNETIC FIELDS AS POSSIBLY CARCINOGENIC TO HUMANS

Lyon, France, May 31, 2011 -- _The WHO/International Agency for Research on Cancer (IARC) has classified radiofrequency electromagnetic fields as **possibly carcinogenic to humans (Group 2B)**, based on an increased risk for **glioma**, a malignant type of brain cancer[1], associated with wireless phone use.

Excerpt from Letter from WHO Lead Scientist Dr. Baan to Iris Atzmon Specifying Smart Meters to be a Part of the Class 2b Carcinogen WHO Classification:

http://citizensforaradiationfreecommunity.org/wp-content/uploads/2012/06/WHO-The-IARC-Working-Group-classified-1.doc

Robert A Baan PhD
The IARC Monographs
IARC, Lyon, FRANCE

"…the classification 2B, possibly carcinogenic, holds for all types of radiation within the radiofrequency part of the electromagnetic spectrum, including the radiation emitted by base-station antennas, radio/TV towers, radar, Wi-Fi, smart meters, etc. "

Smart Meters: Correcting the Gross Misinformation

https://maisonsaine.ca/sante-et-securite/electrosmog/smart-meters-correcting-gross-misinformation.html

Quebec-based magazine La Maison du 21e siecle asked physician David O. Carpenter, former founding dean of the University at Albany (NY)'s School of Public Health, to comment an open letter published in the Montreal daily Le Devoir on May 24 2012. This letter claimed wireless smart meters pose no risk to public health. More than fifty international experts contributed to the following rebuttal.

We, the undersigned are a group of scientists and health professionals who together have coauthored hundreds of peer-reviewed studies on the health effects of electromagnetic fields (EMFs). We wish to correct some of the gross misinformation found in the letter regarding wireless "smart" meters that was published in the Montreal daily *Le Devoir* on May 24. Submitted by a group Quebec engineers, physicists and chemists, the letter in question reflects an obvious lack of understanding of the science behind the health impacts of the radiofrequency (RF)/microwave EMFs emitted by these meters. The statement that « Thousands of studies, both epidemiological and experimental in humans, show no increase in cancer cases as a result of exposure to radio waves of low intensity… » is false (1). In fact, only a few such studies — two dozen case-control studies of mobile phone use, certainly not thousands, have reported no elevations of cancer, and most were funded by the wireless industry. In addition, these reassuring studies contained significant experimental design flaws, mainly the fact that the populations followed were too small and were followed for a too short period of time.

Non industry-funded studies have clearly demonstrated a significant increase in cancer cases among individuals who have suffered from prolonged exposure to low-level microwaves, transmitted notably by radio antennas. The effects were best documented in meta-analyses that have been published and that include grouped results from several different studies: these analyses consistently showed an increased risk of brain cancer among regular users of a cell phone who have been exposed to microwaves for at least ten years. Children and youths are especially vulnerable (2). For example, the 2009 Hardell-Carlberg study reported a consistent association between use of mobile or cordless phones and two types of head tumors, astrocytoma grade I-IV and acoustic neuroma. The authors »found an especially high risk for persons that started use of mobile or cordless phones before the age of 20 years, although based on low numbers ».

Brain Cancer Rates

Furthermore, the argument that brain cancer rates do not indicate an overall increase in incidence is not evidence that cell phones are safe: the latency for brain cancer in adults after environmental exposure can be long, up to 20-30 years. Most North Americans haven't used cell phones extensively for that long. The evidence of the link between long-term cell phone use and brain cancer comes primarily from Northern Europe, where cell phones have been commonly used since the 1990s. Nevertheless, the most recent collection of primary brain tumors mined from pathology units in Australia showed brain cancer incidence rose by about 35% between 2000 and 2008 in the

Australian Capital Territory and New South Wales (total population : more than 7 million).
In May 2011, after reviewing the published scientific literature regarding cancers affecting cell phone users, the International Agency for Research on Cancer (IARC) classified radiofrequency radiation as a 2B, possible human carcinogen. Despite the absence of scientific consensus, the evidence is sufficiently compelling for any cautious parent to want to reduce their loved one's exposure to RF/microwave emissions as much as possible, as recommended by various countries such as Austria, Belgium, Germany, Russia and the United Kingdom.


Dr David O. Carpenter, founder, Univers
Albany (NY) School of Public Health

Electrosensitivity
Public fears about wireless smart meters are well-founded. They are backed by various medical authorities such as those of the Santa Cruz County(California) Public Health Department. These authorities are worried about the growing number of citizens who say they have developed electrohypersensitivity (EHS), especially since for many of them, the symptoms developed after the installation of such meters (it takes some time for most people to link the two events).
Since the turn of the millennium, people are increasingly affected by ambient microwaves due to the growing popularity of wireless devices such as cell phones and Wi-Fi Internet. Therefore, the mass deployment of smart grids could expose large chunks of the general population to alarming risk scenarios without their consent. According to seven surveys done in six European countries between 2002 and 2004, about 10% of Europeans have become electrosensitive. The most famous person to publicly reveal her electrosensitivity is Gro Harlem Brundtland, formerly Prime Minister of Norway and retired Director of the World Health Organization (WHO).
While there is no consensus on the origins and mechanisms of EHS, many physicians and other specialists around the world have become aware that EHS symptoms (neurological dermatological, acoustical, etc.) seem to be triggered by exposure to EMF levels well below current international exposure limits, which are established solely on short-term thermal effects (3). Organizations such as the Austrian Medical Association and the American Academy of Environmental Medicine have recognized that the ideal way to treat of EHS is to reduce EMF exposure.
Therefore, caution is warranted because the growing variety of RF/microwave emissions produced by many wireless devices such as smart meters have never been tested for their potential biological effects.

Well-known bioeffects
While the specific pathways to cancer are not fully understood, it is scientifically unacceptable to deny the weight of the evidence regarding the increase in cancer cases in humans that are exposed to high levels of RF/microwave radiation.

The statement that « there is no established mechanism by which a radio wave could induce an adverse effect on human tissue other than by heating » is incorrect, and reflects a lack of awareness and understanding of the scientific literature on the subject. In fact, more than a thousand studies done on low intensity, high frequency, non-ionizing radiation, going back at least fifty years, show that some biological mechanisms of effect do not involve heat. This radiation sends signals to living tissue that stimulate biochemical changes, which can generate various symptoms and may lead to diseases such as cancer.

Even though RF/microwaves don't have the energy to directly break chemical bonds, unlike ionizing radiation such as X-rays, there is scientific evidence that this energy can cause DNA damage indirectly leading to cancer by a combination of biological effects. Recent publications have documented the generation of free radicals, increased permeability of the blood brain barrier allowing potentially toxic chemicals to enter the brain, induction of genes, as well as altered electrical and metabolic activity in human brains upon application of cell phone RF/microwaves similar to those produced by smart meters.

These effects are cumulative and depend on many factors including RF/microwave levels, frequency, waveform, exposure time, biovariability between individuals and combination with other toxic agents. Clear evidence that these microwaves are indeed bioactive has been shown by the fact that low-intensity EMFs have proven clinically useful in some circumstances. Pulsed EMFs have long been used to successfully treat bone fractures that are resistant to other forms of therapy. More recently, frequency-specific, amplitude-modulated EMFs have been found useful to treat advanced carcinoma and chronic pain.

High frequency EMFs such as the microwaves used in cell phones, smart meters, Wi-Fi and cordless ''DECT'' phones, appear to be the most damaging when used commonly. Most of their biological effects, including symptoms of electrohypersensitivity, can be seen in the damage done to cellular membranes by the loss of structurally-important calcium ions. Prolonged exposure to these high frequencies may eventually lead to cellular malfunction and death.

Furthermore, malfunction of the parathyroid gland, located in the neck just inches from where one holds a cell phone, may actually cause electrohypersensitivity in some people by reducing the background level of calcium ions in the blood. RF/microwave radiation is also known to decrease the production of melatonin, which protects against cancer, and to promote the growth of existing cancer cells.

Early warning scientists attacked

In recommending that the Precautionary Principle be applied in EMF matters, the European Environment Agency's Director Jacqueline McGlade wrote in 2009: "We have noted from previous health hazard histories such as that of lead in petrol, and methyl mercury, that 'early warning' scientists frequently suffer from discrimination, from loss of research funds, and from unduly personal attacks on their scientific integrity. It

would be surprising if this is not already a feature of the present EMF controversy… » Such unfortunate consequences have indeed occurred.

The statement in the *Le Devoir* letter that « if we consider that a debate should take place, it should focus exclusively on the effects of cell phones on health » is basically an acknowledgement that there is at least some reason to be concerned about cell phones. However, while the immediate exposure from a cell phone is of much greater intensity than the exposure from smart meters, cell phone use is temporary.

Smart meters

As Australian Associate Professor of neurosurgery Vini G. Khurana reports, adverse neurological effects have been reported in people who sustain close proximity to wireless meters, especially under 10 feet (3 meters).

A wireless smart meter produces radiofrequency microwave radiation with two antennas in approximately the same frequency range (900 MHz to 2.4 GHz) as a typical cell tower. But, depending on how close it is to occupied space within a home, a smart meter can cause much higher RF exposures than cell towers commonly do. If a smart meter is located on a common wall with a bedroom or kitchen rather than a garage wall, for example, the RF exposure can be the same as being within 200 to 600 feet distance of a cell tower with multiple carriers. With both cell towers and smart meters, the entire body is immersed in microwaves that go out in all directions, which increases the risk of overexposure to many sensitive organs such as the eyes and testicles. With a cell phone, people are exposed to microwaves primarily in the head and neck (unless using speaker mode), and only when the device is turned on or in standby mode.

Wireless smart meters typically produce atypical, relatively potent and very short pulsed RF/microwaves whose biological effects have never been fully tested. They emit these millisecond-long RF bursts on average 9,600 times a day with a maximum of 190,000 daily transmissions and a peak level emission two and a half times higher than the stated safety signal, as the California utility Pacific Gas & Electric recognized before that State's Public Utilities Commission. Thus people in proximity to a smart meter are at risk of significantly greater aggregate of RF/microwave exposure than with a cell phone, not to mention the cumulative exposure received by people living near multiple meters mounted together, pole-mounted routers or utility collector meters using a third antenna to relay RF signals from 500 to 5,000 homes.

A technical study performed by Sage Associates in California indicates that RF levels from various scenarios depicting normal smart meter installation and operation may violate even the out-of-date US public safety standards, which only consider acute thermal effects. This can happen when a person stands close to the meter to read the power consumption, or touches it, or shades the meter face with a hand to better read it. Emissions are also increased by reflective materials, such as stainless steel, other metals and mirrors, which can re-radiate stronger that the otherwise unaltered background. Microwaves are absorbed and dissipated by partially conductive materials, such as cement and special RF shielding paints and fabrics.

In addition to the erratic bursts of modulated microwaves emitted by wireless smart meters transferring usage data to electric, gas and water utilities, wireless as well as wired smart (powerline communication) meters are also a major source of ''dirty electricity'' (electrical interference of high frequency voltage transients typically of kilohertz frequencies). Some scientists, such as American epidemiologist Sam Milham, believe that many of the health complaints about smart meters may also be caused by dirty electricity generated by the « switching » power supply activating all smart meters. Since the installation of filters to reduce dirty electricity circulating on house wiring has been found to relieve symptoms of EHS in some people, this method should be considered among the priorities aimed at reducing potential adverse impacts. Indeed, the Salzburg State (Austria) Public Health Department confirms its concern about the potential public health risk when in coming years almost every electric wire and device will emit such transient electric fields in the kilohertz-range due to wired smart meters.

Rather be safe than sorry

The apparent adverse health effects noted with smart meter exposure are likely to be further exacerbated if smart appliances that use wireless communications become the norm and further increase unwarranted exposure.

To date, there have been few independent studies of the health effects of such sources of more continuous but lower intensity microwaves. However, we know after decades of studies of hazardous chemical substances, that chronic exposure to low concentrations of microwaves can cause equal or even greater harm than an acute exposure to high concentrations of the same microwaves.

This is why so many scientists and medical experts urgently recommend that measures following the Precautionary Principle be applied immediately — such as using wired meters — to reduce biologically inappropriate microwave exposure. We are not advocating the abolishment of RF technologies, only the use of common sense and the development and implementation of best practices in using these technologies in order to reduce exposure and risk of health hazards.

(1) • Scientific papers on EMF health effects
(2) On Nov. 19 2012, we struck from this letter an error propagated in the media claiming that « In May 2012, the U.K.'s Office of National Statistics reported a 50 percent increase in incidence of frontal and temporal lobe tumors in children between 1999 and 2009. »
(3) Explanation and studies on electrosensitivity
(4) Governments and organizations that ban or warn against wireless technology• David O. Carpenter, MD, Director, Institute for Health & the Environment, University at Albany, USA
• Franz Adlkofer, M.D., Chairman of the Pandora Foundation, Coordinator of the European Reflex Report on DNA-damage by cellphone radiation, Neuendorf, Germany
• M. S. H. Al Salameh, PhD, Professor of Electrical Engineering, University of Science & Technology, Irbid, Jordan

• Jennifer Armstrong, MD, Past President, American Society for Environmental Medicine, Founder, Ottawa Environmental Health Clinic, Ontario, Canada
• Pierre L. Auger, MD, Occupational medicine, Multiclinique des accidentés 1464, Montreal, Quebec, Canada
• Igor Beliaev, PhD, Head research scientist, Cancer Research Institute, Slovak Academy of Sciences, Bratislava, Slovak republic
• Fiorella Belpoggi, PhD, Director Cesare Maltoni Cancer Research Center, Ramazzini Institute, Bologna, Italy
• Dominique Belpomme, MD, Director of the European Cancer and Environment Research Institute, Brussels, Belgium
• Martin Blank, PhD, former President, Bioelectromagnetics Society, Special Lecturer, Department of Physiology and Cellular Biophysics, Columbia University Medical Center, New York, USA
• Barry Breger, MD, Centre d'intégration somatosophique (orthomolecular medicine), Montreal, Quebec
• Simona Carrubba, PhD, Prof. Biophysics, Daemen College, Amherst, NY, Associate Researcher, Neurology, Buffalo General Hospital , Buffalo, NY
• John Cline, MD, Professor, Institute for Functional Medicine, Federal Way, WA, USA, Medical Director, Cline Medical Centre, Nanaimo, BC, Canada
• Alvaro Augusto de Salles, PhD, Professor of Electrical Engineering, Federal University of Rio Grande do Sul, Porto Alegre, Brazil
• Christos Georgiou, Prof. Biochemistry, Biology Department, University of Patras, Greece
• Andrew Goldsworthy, PhD, Honorary lecturer in Biology, Imperial College, London, UK
• Claudio Gómez-Perretta, MD, Director, Centro de Investigación, Hospital Universitario LA Fe, Valencia, Spain
• Livio Giuliani, PhD, Senior Researcher, National Insurance Institute (INAIL), Chief of Radiation and Ultrasounds Research Unit, Rome, Italy
• Yury Grigoriev, PhD, Chair Russian National Committee on Non-Ionizing Radiation Protection, Moscow, Russia
• Settimio Grimaldi, PhD, Director, Institute of Translational Pharmacology (Neurobiology and molecular medicine), National Research Council, Rome, Italy
• Magda Havas, PhD, Centre for Health Studies, Trent University, Canada
• Lennart Hardell, MD, Professor of Oncology, University Hospital, Örebro, Sweden
• Denis L. Henshaw, PhD, Professor of Physics, Head of The Human Radiation Effects Group, University of Bristol, UK
• Ronald B. Herberman, MD, Chairman of Board, Environmental Health Trust, and Founding Director emeritus, University of Pittsburgh Cancer Institute, USA
• Donald Hillman, PhD, Dairy Science, Professor Emeritus, Department of Animal Science, Michigan State University, USA
• Isaac Jamieson, PhD, Environmental Science (electromagnetic phenomena in the built environment), independent architect, scientist and environmental consultant, Hertfordshire, UK
• Olle Johansson, PhD, Professor of Neuroscience (Experimental Dermatology Unit), Karolinska Institute, Stockholm, Sweden
• Yury Kronn, PhD, Soviet authority on physics of nonlinear vibrations and high

frequency electromagnetic vibrations, founder of Energy Tools International, Oregon, USA
• Vini G. Khurana, MBBS, Associate of Professor of Neurosurgery, Australian National University, Australia
• Henry Lai, PhD, Professor of Bioengineering, University of Washington School of Medicine, Seattle, WA, USA
• Abraham R. Liboff, PhD, Professor Emeritus, Department of Physics, Oakland University, Rochester, Michigan, USA
• Don Maisch, PhD, Researcher on radiation exposure standards for telecommunications frequency, EMFacts Consultancy, Tasmania, Australia
• Erica Mallery-Blythe, MD, Emergency Medicine Physician, England
• Andrew A. Marino, MD, Professor of Neurology, LSU Health Sciences Center, Shreveport, LA, USA
• Karl Maret, MD, President, Dove Health Alliance, Aptos, CA, USA
• Fiorenzo Marinelli, PhD, Researcher on biological effects of EMFs, Institute of Molecular Genetics, National Research Council, Bologna, Italy
• Andrew Michrowski, PhD, Director, Planetary Association for Clean Energy, Ottawa, Canada
• Sam Milham, MD, former chief epidemiologist, Washington State Department of Health, USA
• Joel M. Moskowitz, PhD, Director, Center for Family and Community Health, School of Public Health, University of California, Berkeley
• Gerd Oberfeld, MD, Public Health Department, Salzburg State Government, Austria
• Mike O'Carroll, PhD, Professor Emeritus (Applied Mathematics), University of Sunderland, UK
• Jerry L. Phillips, PhD, Director, Center for Excellence in Science, Department of Chemistry and Biochemistry, University of Colorado, USA
• John Podd, PhD, Professor of Psychology (experimental neuropsychology), Massey University, New-Zeland
• William J. Rea, MD, thoracic and cardiovascular surgeon, founder of the Environmental Health Center, Dallas, Tx, USA
• Elihu D. Richter, MD, Professor, Hebrew University-Hadassah School of Public Health and Community Medicine, Jerusalem, Israel
• Leif G. Salford, MD, Senior Professor of Neurosurgery, Lund University, Sweden
• Nesrin Seyhan, MD, Founder and Chair of Biophysics, Medical Faculty of Gazi University, Turkey
• Cyril W. Smith, PhD, lead author of "Electromagnetic Man", retired from Electronic and Electrical Engineering, University of Salford, UK
• Morando Soffritti, MD,
Scientific Director of the European Foundation for Oncology and Environmental Sciences "B. Ramazzini" in Bologna, Italy
• Carlos Sosa, MD, surgeon affected by the Microwave syndrome, Medellin, Columbia
• Antoinette "Toni" Stein, PhD, Collaborative on Health and the Environment (CHE-EMF Working Group), Co-Coordinator, Berkeley, CA, USA
• Stanislaw Szmigielski, MD, PhD Professor of Pathophysiology, Consulting Expert, former director of Microwave Safety, Military Institute of Hygiene and Epidemiology,

Warsaw, Poland
• Lauraine Vivian, PhD, Senior Lecturer, Primary Health Care Directorate, Faculty of Health Sciences, University of Cape Town, South Africa.
• Bradford S. Weeks, MD, Director, The Weeks Clinic, Clinton, WA, USA
• Stelios A. Zinelis, MD, Vice-President, Hellenic Cancer Society, Cefallonia, Greece

Maine Coalition To Stop Smart Meters, Evidence for Legal Proceedings On the Issue of Health Impacts Which Both THeir Utility and PUC Has Ignored

http://www.mainecoalitiontostopsmartmeters.org/2013/04/intervenor-evidence/

1. Precautionary Principal and Research Gaps
1.A Evidence to support the use of the Precautionary Principal in public policy on RFR (filed 02/01/13, 14 PRJ* studies). ***1A-1C are in one filing. PUC # 193. 1.A-1.C: Corrected Filing 03/20/13, PUC # 438***
1.B Peer-reviewed, published articles by government agencies on the use of the Precautionary Principal in Public Policy to protect public health (filed 02/01/13, 29 PRJ)
1.C The Precautionary Principal has recently (2008 to 2012) been applied to US public health policies, environmental policies, medical policies, and other industries: (filed 02/1/13, 9 PRJ)
1.D Research gaps in the study of RFR effects on children & long term exposures require the use of precaution (filed 02/01/13, 8 PRJ, 5 other). ***PUC # 194***

2. Eye Studies
2.0 Evidence that exposure to RFR can cause adverse biological effects to eyes (filed 03/05/13, 21 PRJ). ***PUC # 411***

3. Reproductive System: Sperm, Fertility & Reproductive Studies
3.A Evidence of biological effects of EMF/RF radiation exposure on sperm, reproduction, fertility & pregnancy (filed 02/18/13, 87 PRJ) ***3A & B are in one filing. PUC # 251***
3.B Other relevant Reviews on these topics (filed 02/18/13, 2 PRJ)

4. Children and Fetus Studies
4.A Evidence of biological effects of RFR exposure on neonatal, fetus & children (filed 02/18/13, 65 PRJ) ***4A & B are in one filing. PUC # 262***
4.B Other reviews of evidence by doctors and scientist that conclude the possibility of adverse biological effects on children/fetus from RFR (filed 02/18/13, 15 PRJ).

5. Genotoxic (DNA) Studies
5. Evidence of genotoxic, gene expression, & chromosomal effects from EMF exposure (filed 02/11/13, 186 PRJ). ***PUC # 220, Corrected Filing 04/3/13. PUC # 456***

6. Neurological & Blood Brain Barrier Studies
6.A Evidence of neurodegenerative & neurological effects (includes BBB) biological effects

from exposure to RFR (filed 03/04/13, 167 PRJ). ***6A & B are in one filing. PUC # 383. Corrected Filing 03/22/13. PUC # 444.***
6.B Relevant studies found on this topic that have not been listed as being *reviewed* by any scientific groups previously named in 6A above (filed 03/04/13, 10 PRJ).
6.C Evidence of research bias known as the "funding effect" has been found within EMF radiation research conducted to determine Genotoxic effects & cancer (filed 03/04/13).

Intervenor-Filed Submissions by Category & Number

By MeC2SSM webMS

April 16, 2013Activism Health Legal Privacy Research WildlifeNo comments

Below are Index and Category Lists of evidence filed by the Interveners in MPUC case 2011-00262 (our grassroots effort to stop the exploitative deployment of not-so-smart meters in the State of Maine). In most category PDFs, there are some items shaded in yellow with the notation "Copy Filed in Docket." These are documents filed in their entirety (not included here). Unbelievably, CMP (Central [Sp]aine Power) has motioned to exclude all filed evidence.

Regardless, these 1,400 or so references in various iterations will be a tremendous resource for anyone working on the "smart" meter issue. In most of the Category Lists, peer-reviewed journals are designated by "PRJ." Also included are the PUC filing dates and filing numbers. Thanks so much to Dianne Wilkins and Suzanne Foley-Ferguson for compiling this overwhelming body of evidence. It was a herculean task and, if allowed into evidence, it will help our cause as much if not more than anything else. Assuming of course, the Maine PUC staff reads the materials . . . —*By Ed Friedman*

1. Precautionary Principal and Research Gaps
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6.C Evidence of research bias known as the "funding effect" has been found within EMF radiation research conducted to determine Genotoxic effects & cancer (filed 03/04/13).

7. Wildlife, Animal & Plant Studies
7. RFR effects on Wildlife, Animals, and Plants (List filed 03/05/13-PUC file #406; ***Corrected Filing 4/09/13; 76 PRJ, 8 other docs) PUC # 468***

8. Telecom/Industry Reports & Studies
8. Telecoms statements, studies, & reports regarding RFR (1 PRJ, 8 other docs) (List filed 3/11/13). ***Corrected Filing 4/9/13. PUC # 464***.

9. Insurance & Liability Reports and Studies
9. Insurance and Liability of wireless communication carriers (1 PRJ; 23 documents) (List filed 3/13/13 PUC#433) ***Corrected Filing 4-8-13. PUC # 464***.

10. Other Testimony, Including Legal from Other Cases
10. Other testimony of experts on EMF from other EMF cases (23 documents) (List filed 3/29/13 PUC # 449). ***Corrected Filing 4/8/13. PUC # 464***.

11. Electrical Hypersensitivity (EHS) Reports, Standards, Studies
11.A Evidence of EMF radiation causing EHS (List filed 03/05/13, 91 PRJ) ***11A & B are one filing. PUC # 404.***
11.B Part B -Recognition of EHS in the United States and Other Countries (List filed 03/05/13, 29 studies PRJ). Repeated Filing 4/10/13 PUC 470, ***Corrected Filing 4/10/13 PUC # 471***

12. Immune System Studies
12. Evidence of immune effects from exposure to RFR (filed 02/28/13, 36 PRJ). ***PUC # 308.***
13. Oxidative Stress Studies
13. A Evidence of adverse biological effects of oxidative stress from RFR exposure (filed 02/26/13, 55 PRJ). ***13A & B in one filing. PUC # 286. Corrected Filing 03/28/13 PUC # 448***
13.B Studies describing the role of oxidative stress in DNA damage, cancer, neurodegenerative diseases and human fertility (filed 02/26/13, 6 PRJ)

14. Mechanism of Biological Effects Studies
14. Studies showing mechanisms for RFR effects on biological bodies (filed 03/05/13, 65 PRJ). ***PUC # 410***

15. Reviews of Biological Effects
15. Evidence: Comprehensive Reviews of Biological Effects of EMF (filed 02/28/13, last revised filing on 03/05/13, 134 PRJ) ***PUC File # 408. Corrected Filing 03/28/13. PUC # 447.***

16. 2.4 GHz Effects Studies
16. Biological effects of EMF at 2.4 GHz of radiofrequency (filed 2/28/13, revised filing on 03/04/13, 79 PRJ). ***PUC File # 366. Corrected Filing 04/1/13. PUC # 451***.

17. Low Power Density Effects/Studies
17. Evidence of effects of EMF at low power densities (filed 03/04/13; 45 PRJ). ***PUC # 376. Corrected Filing 04/1/13. PUC # 454***

18. Studies of Funding Bias, Effects & Conflict of Interest
18. Studies showing evidence of bias, funding effect, and conflict of interest in EMR Research (13 PRJ studies; 26 other; filed 03/05/13 ***PUC # 405, Corrected Filing 04/08/13 PUC # 465***

BIOLOGICAL AND HEALTH EFFECTS OF MICROWAVE RADIO FREQUENCY TRANSMISSIONS A REVIEW OF THE RESEARCH LITERATURE

http://tinyurl.com/nxnmj76

A REPORT TO THE STAFF AND DIRECTORS OF THE EUGENE WATER AND ELECTRIC BOARD

June 4, 2013

EXECUTIVE SUMMARY

The FCC regulations for permissible exposures to microwave radio frequency (RF) transmissions are only designed to protect against the thermal effects of high exposure levels. Representatives of the telecommunications industry usually assert that there is “no clear or conclusive” scientific evidence regarding the biological effects of low level or “nonthermal” RF exposures. But in actuality, a large body of scientific research documents that RF exposures at low levels can produce adverse biological or health effects.

The installation of RF-transmitting “smart meters” by our electric utility could significantly increase the level of RF exposure in Eugene’s residential neighborhoods.

Such an increase carries potential health risks. The nature of these risks needs to be carefully considered before making a decision to deploy this technology.
Any decision-making process that ignores this possibility of harm could cause significantly damage both to community health and to EWEB’s goodwill in the community.

ELECTROHYPERSENSITIVITY (EHS)

Microwave RF exposures can produce acute symptoms in some individuals.
These symptoms can include headache, sleep disturbance, difficulty in concentration, memory disturbance, fatigue, depression, irritability, dizziness, malaise, tinnitus, burning and flushed skin, digestive disturbance, tremor, and cardiac irregularities. This syndrome was described by Russian researchers in the 1950’s, who called it “microwave sickness”. Between 1953 and 1978 the Russian government purposefully targeted the U.S. embassy in Moscow with beams of microwave RF, producing symptoms of microwave sickness in many embassy employees.

In recent years, the build out of the wireless telecommunications infrastructure has greatly increased the exposure of the general public to microwave RF, and this has led to an increased number of individuals experiencing symptoms that are now referred to as “Electrohypersensitivity Syndrome” (EHS). Multiple research studies have shown a correlation between these symptoms and residential exposure to radio,radar, and cell tower transmissions.

The prevalence of EHS appears to be increasing, as the exposure of the public to RF continues to expand. Based on recent epidemiologic research, it would be reasonable to assume RF exposures provoke some sort of symptoms in between 3 and 5% of the population of Eugene at the current time. Any significant increase in residential RF exposure is likely to make these individuals more symptomatic, and to produce some new cases of EHS by pushing some other individuals beyond their tolerance limit.

ALTERED PHYSIOLOGY

Laboratory research in animal and human subjects has shown that “nonthermal” levels of RF exposure can alter EEG, immune function, and hormone levels including

adrenal and thyroid hormones, testosterone, prolactin, progesterone.
Research shows that low levels of microwave RF exposure can reduce melatonin levels in humans, and that some individuals are more sensitive than others to this effect.

The adverse effects of nighttime RF exposure on melatonin secretion are particularly disturbing. The nocturnal rise in melatonin levels supports the natural function of sleep, and disrupting this cycle can produce insomnia. Melatonin is an extremely potent antioxidant, and helps to repair damaged DNA and heal the body from other effects of oxidant stress.

Melatonin is also protective against the growth of cancer cells, and disruption of the circadian melatonin cycle has been shown to lead to increased tumor growth in a variety of cancer types. Women who have lower levels of nocturnal melatonin are at greater risk for developing breast cancer. Reduced melatonin levels may also increase the incidence of prostate cancer.

OXIDATIVE STRESS AND DAMAGED DNA

In contrast with Xrays and gamma rays, Microwave radiation does not have sufficient power to directly break covalent bonds in DNA molecules. But microwave RF can produce resonance interactions with ions and with charged macromolecules, and such interactions can significantly alter biochemical functions. A large body of research has shown that microwave RF causes an increased production of free radicals and reactive oxidant species in living tissues, and that this increased oxidant stress damages DNA. This damage can and does occur at power levels well below those levels that could produce damage by thermal mechanisms.

Any chronic exposure to conditions that damage DNA can lead to an increased risk of cancer. Evidence of increased risk of certain types of cancer has been demonstrated in groups with occupational exposure to microwave RF, including radio technicians in private industry, military personnel, commercial airline pilots, and ham radio operators. Elevated levels of cancer have been demonstrated in populations with increased residential exposure to radio transmission towers. And in the last ten years, studies fro Israel, Germany, Austria, and Brazil have documented significant increased in breast cancer and other cancers in individuals living less than 500 meters from cell phone towers, with measured exposure levels much lower than those permitted by current FCC guidelines.

Research has also shown that RF exposure levels well within current guidelines can cause DNA damage and reduced fertility in insects, birds, amphibians and mammals, and can lower sperm counts, sperm motility, and sperm motility in human beings.

CONCLUSIONS

Existing scientific research offers strong evidence that the chronic exposure of the public to microwave RF transmissions produces serious acute and chronic health effects in a significant portion of the population.

Electromagnetic fields act via activation of voltage-gated calcium channels to produce beneficial or adverse effects

http://onlinelibrary.wiley.com/doi/10.1111/jcmm.12088/pdf

Prof. Martin Pall writes:

"One of the great puzzles about the action of electromagnetic fields is how can they influence the biology of our bodies? The reason that this is such a great puzzle is that these fields are comprised of low energy photons, with energies too low to influence the chemistry of our bodies. So how can they possibly influence our biology? Many have argued that the only thing that they can possibly do is to heat things, and yet it is very clear that levels of exposure that produce only the slightest heating have been repeatedly shown to produce substantial biological effects. Now this puzzle has been solved in a paper with the title of this email, published on line in the Journal of Cellular and Molecular Medicine, freely available on the publisher's web site:"

"That paper reviews 24 different studies in which EMF exposures produce biological effects that can be blocked by using calcium channel blockers, drugs that block the action of voltage-gated calcium channels (VGCCs). Most of these drug studies implicated L-type VGGCs, showing blockage by channel blockers specific for these L-"type VGCCs; however three other classes of the voltage gated calcium channels were also implicated in some of these studies. What these and other studies show, is that EMF exposures act by partially depolarizing the electrical charge across the plasma membrane of cells, activating the VGCCs and it is the increased intracellular calcium levels that are responsible for the reaction to EMF exposure. These 24 studies implicate the VGCCs in responses to a variety of EMFs, including extremely low frequency EMFs such as 50 and 60 cycle fields produced by our alternating currents in our wiring, various microwave/radiofrequency EMFs and nanosecond electrical pulses. Static electrical fields also act via VGCCs, not surprisingly because they also influence the electrical charge across plasma membranes."

“Perhaps more surprisingly, static magnetic fields also act via VGCCs. This is a bit surprising because static magnetic fields do not produce electrical changes in static objects. However as pointed out in the paper, living cells in the body are rarely static, often moving rapidly in such phenomena as cellular ruffling.“

“Having resolved this long-standing puzzle, the paper goes on to consider how VGCC activation can produce two well-documented responses to EMF exposure: stimulating of bone growth and the production of single stranded DNA breaks in EMF-exposed cells. EMF exposures have repeatedly been shown to produce increases in nitric oxide levels, in some cases almost instantaneously. These nitric oxide increases are produced through calcium stimulation of the action of the two nitric oxide synthases in the cell, iNOS and eNOS, which are both calcium-dependent enzymes. Nitric oxide in the cell, acts to produce most physiological effects, by stimulating the production of cycle GMP which stimulates, in turn the G-kinase (this is known as the NO/sGC/cGMP/G-kinase pathway). Most pathophysiological responses to nitric oxide to through another pathway, where nitric oxide acts as a precursor of peroxynitrite, a potent oxidant and reactive free radical precursor. The paper suggests that the EMF stimulation of bone growth, a very promising therapeutic response, goes through the first pathway. It also suggests that induction of single strand breaks in cellular DNA goes through the second pathway. It is possible that possible beneficial effects of EMFs go through the first pathway and adverse, pathophysiological effects go through the second pathway. Clearly we will need a lot of study to test mechanisms of EMF action.”

“This paper may be viewed in a practical setting as being very important in two ways:”

1. “There have been many claims that biological effects of EMF exposures cannot possibly exist because no plausible mechanism of action of such exposures could produce such effects. Clearly these claims are now defunct.”

2.“In studies aimed at understanding the mechanisms of action of EMF exposures we now know where to look. Such studies need to look at roles of VGCCs, intracellular calcium, nitric oxide and possibly cycle GMP or peroxynitrite. It can be argued, therefore, that this paper is very much a game changer, changing a situation where there has been substantial confusion, into one where, specific, targeted questions can be asked and answered experimentally.”

“Finally, this paper says nothing at all about EMF hypersensitivity (often abbreviated EHS), a condition where previous EMF exposure appears to induce high level sensitivity to some types of EMFs. EHS is similar to multiple chemical sensitivity (MCS), where previous chemical exposures produce high level chemical sensitivity. Chemicals act in MCS by indirectly activating the NMDA receptors and NMDA receptors have many similarities in their properties to those of the L-type VGCCs. You should expect, therefore, a future paper

on a detailed proposed mechanism for EHS, with both many similarities and some apparent mechanism of MCS as well as some differences."

Hirsh Report - Smart Meters Worse Than Cell Phones – Two Orders of Magnitude

Posted on http://eon3emfblog.net/?p=1724 February 21, 2011 by James Heddle

Debunking 'Cut-and-Paste Science'

New calculations suggest that continuous whole-body exposure to electro-magnetic radiation from so-called 'smart' meters – which operate around the clock – may be between 50 and 160 times worse that from cell phones.

For over 40 years Committee to Bridge the Gap, under the leadership of Dan Hirsch, has provided accurate, authoritative scientific information on the public health dangers posed by ionizing radiation emitted by nuclear materials and technologies – much to the discomfiture of the nuclear industry. Now Hirsch has weighed in on the non-ionizing radiation emitted by 'smart' meters, cell phones and other other wireless RF devices. [For more on CBG - the Committee to Bridge the Gap - click here.]

Hirsch's critique of the recent draft report on 'smart' meter RF emissions issued by the California Council on Science and Technology (CCST) in response to requests from State legislator Jerad Huffman and others, shows that "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."

Hirsch observes, "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."

Working with two graduate student assistants, Hirsch used the CCST's own figures to calculate corrections to the multiple errors he found in the CCST report. His findings focus on whole-body exposure and 'duty cycles,' or the length of time 'smart' meters operate (24/7) as compared with the much shorter normal operation times of cell phone and microwave ovens. They are summarized in the chart below. [Download a full PDF of the Hirsch critique here.]

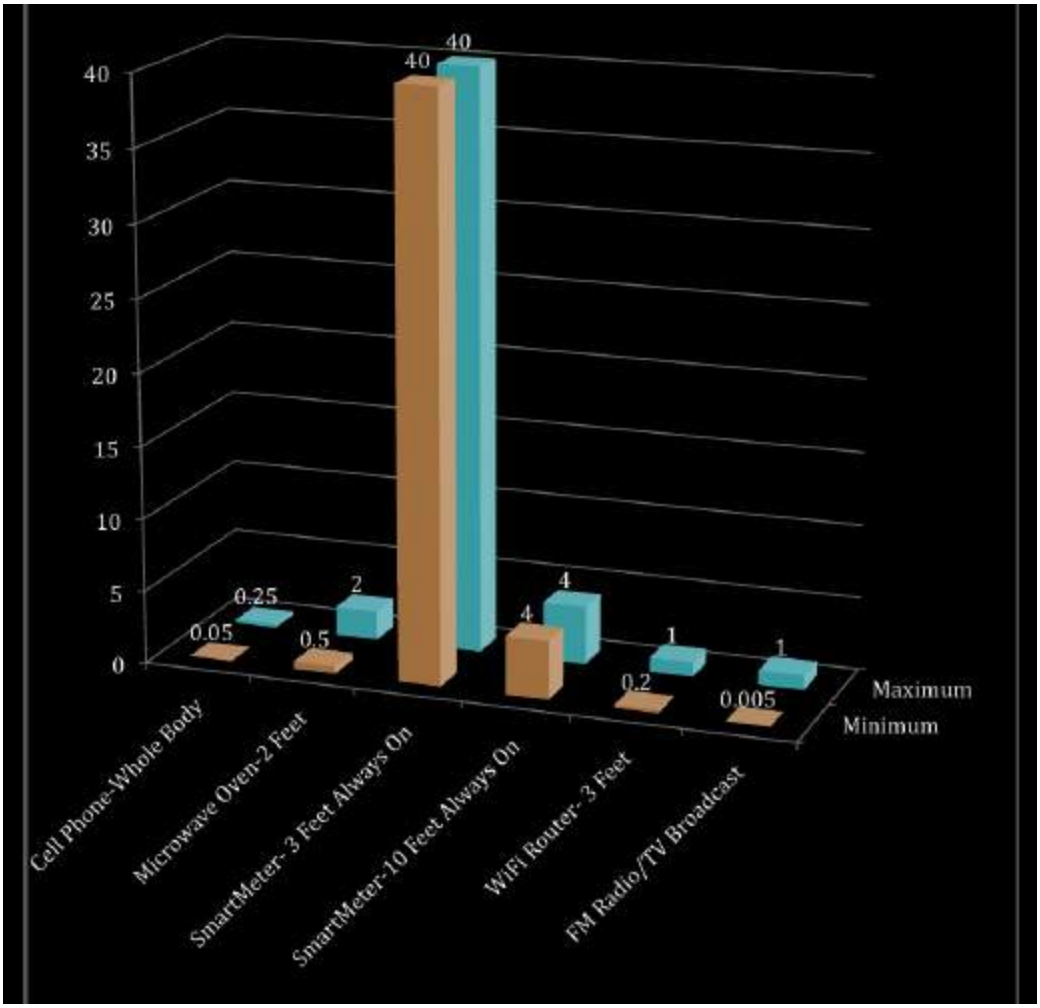

Figure A. Comparison of Radio-Frequency Levels to the Whole Body from Various Sources in µW/cm2 [microwatts per centimeter squared] over time – corrected for assumed duty cycle and whole body exposure extrapolated from assumed cell phone dose at ear.

← Full Spectrum Resistance to 'Smart' Meters Grows

487% Higher Radiation from Silver Springs/PG&E Smart Meter →

Havas Report on Smart Meters for CCST

HTTP://WWW.MAGDAHAVAS.COM/2011/01/18/HAVAS-REPORT-ON-SMART-METERS-FOR-CCST/

January 17, 2011. The California Council on Science and Technology (CCST) released their report on Smart meters "Health Impacts of Radio Frequency from Smart Meters". Click here to download this document.

CCST invited me to submit a written report as part of a *Technical Response Team* in October 2010. Note: CCST did not offer, and I did not request, payment for my report.

In December I was informed that neither my report nor any of the others would be appended to the final document nor would they be made available to anyone.

My submission does not support the final conclusions in the CCST report and I provide it here for anyone interested. For a pdf copy click here.

My overall conclusions are as follows:

In conclusion, I have great concern regarding the **current levels of microwave radiation** in North America. Instead of promoting wireless technology, we should be promoting wired technology and reserving wireless for situations where wired in not possible (while one is traveling for example).

Shortly after X-rays were discovered, they were used in shoe stores to determine shoe-size for young children. Fortunately, we recognized that X-rays were harmful and we restricted their use to essential medical diagnoses. We need to recognize that microwaves are also harmful and we cannot use this technology in a frivolous manner. With more frequencies being used, with the levels of radiation increasing, and with so little research on the long-term, low-level effects of this technology we are creating a potential time bomb. If smart meters are placed on every home, they will contribute significantly to our exposure and this is both unwise and unsafe.

Chronology:

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

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

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

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

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

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

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

On January 11, 2011, CCST released their report "Health Impacts of Radio Frequency from Smart Meters" on their website: Click here to download this document and to provide comments. CCST is receiving public comments until January 31, 2011. http://www.ccst.us/news/2011/20110111smart.php.

Let us hope that this process will be transparent and that all documents CCST receives will be made public on their website.

Seletun Report

Scientific panel on electromagnetic field health risks: consensus points, recommendations, and rationales

Abstract
http://www.ncbi.nlm.nih.gov/pubmed/21268443

Full Report
http://thepeoplesinitiative.org/images/pdf/Home/Seletun_Statement_Fragopoulou_et_al_2010b.pdf

"For whole body (in vivo experiments) or cell culture based exposure, the Seletun Scientific Panel finds sufficient evidence to establish a scientific benchmark for adverse health effect at 0.0166 W/kg based on at least 32 scientific studies reporting low intensity effects (defined as studies reporting effects at exposures of 0.1 W/kg or lower)/8-39/."
"**The Panel recommends a provisional whole body limit of 0.00033 W/kg by incorporation of an additional 50 fold safety margin applied to the scientific benchmark of 0.0166 W/kg"** This is consistent with both ICNIRP and IEEE/FCC safety factors. An additional 10 fold reduction is applied to take prolonged exposure into account (because **29 of the 32 studies are acute exposure only**), giving a final whole body limit of 0.000033 W/kg (33 μW/kg). No further safety margin or provision for sensitive populations is incorporated. **This may need to be lowered in the future.**

Based on power density measurements, the Seletun Scientific Panel finds sufficient evidence for a whole body scientific bench mark for adverse health effect exists down to 85 mW/m (0.0085 mW/cm or 8.5 μW/cm based on at least 17 scientific studies reporting low intensity effects on humans. Taking more recent human studies conducted near base stations, or at base station RF levels, Kundi and Hutter /57/report that the levels must exceed 0.5-1.0 mW/m (0.05 to 0.1 uW/cm) for effects to be seen; /40-57/.

- **The Panel recommends a provisional whole body (far field) limit of 1.7 mW/m (also = 0.00017 mW/cm = 0.17 μ W/cm** by incorporation of an additional 50 fold safety margin applied to the scientific benchmark of 85 mW/m This is consistent with both ICNIRP and IEEE/FCC safety factors. **This may need to be lowered in the future.** It can be argued that a further 10 fold reduction is not justified since 13 of the 17 studies are already testing for long term RF exposure. However, considering that the latest human population studies as reported by Kundi & Hutter (2009) do not show effects below 0.5-1.0 mW/m, it can also then be
argued that an additional 10 fold reduction on precautionary grounds is justified. **If another 10 fold reduction is applied, the recommended level would then be 0.17 mW/m (also 0.000017 mW/cm = 0.017 μW/cm);**

BioInitiative 2012

www.bioinitiative.org/

A Rationale for Biologically-based
Exposure Standards for Low-Intensity

Electromagnetic Radiation

BioInitiative Working Group 2012
Jitendra Behari, PhD, India
Paulraj Rajamani, PhD, India
Carlo V. Bellieni, MD, Italy
Igor Belyaev, Dr.Sc., Slovak Republic
Carl F. Blackman, PhD, USA
Martin Blank, PhD, USA
Michael Carlberg, MSc, Sweden
David O Carpenter, MD, USA
Zoreh Davanipour, DVM, PhD USA
Adamantia F. Fragopoulou, PhD, Greece
David Gee, Denmark
Yuri Grigoriev, MD, Russia
Kjell Hansson Mild, PhD, Sweden
Lennart Hardell, MD, PhD, Sweden
Martha Herbert, PhD, MD, USA
Paul Héroux, PhD, Canada
Michael Kundi, PhD, Austria
Henry Lai, PhD, USA
Ying Li, PhD, Canada
Abraham R. Liboff, PhD, USA
Lukas H. Margaritis, PhD, Greece
Henrietta Nittby, MD, PhD, Sweden
Gerd Oberfeld, MD, Austria
Bertil R. Persson, PhD, MD, Sweden
Iole Pinto, PhD, Italy
Cindy Sage, MA, USA
Leif Salford, MD, PhD, Sweden
Eugene Sobel, PhD, USA
Amy Thomsen, MPH, MSPAS, USA

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BioInitiative Report: A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Radiation at www.bioinitiative.org, December 31, 2012

PREFACE

The Organizing Committee thanks the participants of the BioInitiative Working Group for their integrity and intellectual courage in dealing with this controversial and important topic; and for devoting the time and energy to produce their chapters. The information and conclusions in each chapter are the responsibilities of the authors of that chapter.

The Group has produced what the authors hope will be a benchmark for good science and

public health policy planning. It documents bioeffects, adverse health effects and public health conclusions about impacts of non-ionizing radiation (electromagnetic fields including extremely-low frequency ELF-EMF and radiofrequency/microwave or RFEMF fields).

Societal decisions about this body of science have global implications. Good public health policy depends on acting soon enough, but not without cause, and with enough information to guide intelligent actions. To a great degree, it is the definition of the standard of evidence used to judge the scientific reports that shapes this debate.

Disagreement about when the evidence is sufficient to take action has more to do with the outcome of various reviews and standard-setting proceedings than any other single factor. Whatever "standard of evidence" is selected to assess the strength of the science will deeply influence the outcome of decisions on public policy.

We are at a critical juncture in this world-wide debate. The answers lie not only in the various branches of science; but necessarily depend on the involvement of public health and policy professionals, the regulatory, legal and environmental protection sectors, and the public sector.

This has been a long-term collaboration of international scientists employing a multidisciplinary approach to problem assessment and solving. Our work has necessarily relied on tools and approaches across the physical, biological and engineering sciences; and those of the environmental scientist and public health professional. Only when taken together can we see the whole and begin to take steps that can prevent possible harm and protect future generations.

Signed: _____ Signed: _____

David Carpenter, MD Cindy Sage, MA
Co-Editor Co-Editor

BioInitiative Report BioInitiative Report

BIOINITIATIVE 2012 – CONCLUSIONS Table 1-1
Overall, these 1800 or so new studies report abnormal gene transcription (Section 5); genotoxicity and single-and double-strand DNA damage (Section 6); stress proteins because of the fractal RF-antenna like nature of DNA (Section 7); chromatin condensation and loss of DNA repair capacity in human stem cells (Sections 6 and 15); reduction in free-radical scavengers – particularly melatonin (Sections 5, 9, 13, 14, 15, 16 and 17); neurotoxicity in humans and animals (Section 9), carcinogenicity in humans (Sections 11, 12, 13, 14, 15, 16 and 17); serious impacts on human and animal sperm morphology and function (Section 18); effects on offspring behavior (Section 18, 19 and 20); and effects on brain and cranial bone development in the offspring of animals that are exposed to cell phone radiation during

pregnancy (Sections 5 and 18). This is only a snapshot of the evidence presented in the BioInitiative 2012 updated report.

BIOEFFECTS ARE CLEARLY ESTABLISHED

Bioeffects are clearly established and occur at very low levels of exposure to electromagnetic fields and radiofrequency radiation. Bioeffects can occur in the first few minutes at levels associated with cell and cordless phone use. Bioeffects can also occur from just minutes of exposure to mobile phone masts (cell towers), WI-FI, and wireless utility 'smart' meters that produce whole-body exposure. Chronic base station level exposures can result in illness.

BIOEFFECTS WITH CHRONIC EXPOSURES CAN REASONABLY BE PRESUMED TO RESULT IN ADVERSE HEALTH EFFECTS

Many of these bioeffects can reasonably be presumed to result in adverse health effects if the exposures are prolonged or chronic. This is because they interfere with normal body processes (disrupt homeostasis), prevent the body from healing damaged DNA, produce immune system imbalances, metabolic disruption and lower resilience to disease across multiple pathways. Essential body processes can eventually be disabled by incessant external stresses (from system-wide electrophysiological interference) and lead to pervasive impairment of metabolic and reproductive functions.

LOW EXPOSURE LEVELS ARE ASSOCIATED WITH BIOEFFECTS AND ADVERSE HEALTH EFFECTS AT CELL TOWER RFR EXPOSURE LEVELS

At least five new cell tower studies are reporting bioeffects in the range of 0.003 to 0.05 μW/cm2 at lower levels than reported in 2007 (0.05 to 0.1 uW/cm2 was the range below which, in 2007, effects were not observed). Researchers report headaches, concentration difficulties and behavioral problems in children and adolescents; and sleep disturbances, headaches and concentration problems in adults. Public safety standards are 1,000 – 10,000 or more times higher than levels now commonly reported in mobile phone base station studies to cause bioeffects.

EVIDENCE FOR FERTILITY AND REPRODUCTION EFFECTS: HUMAN SPERM AND THEIR DNA ARE DAMAGED

Human sperm are damaged by cell phone radiation at very low intensities in the low microwatt and nanowatt/cm2 range (0.00034 – 0.07 uW/cm2). There is a veritable flood of new studies reporting sperm damage in humans and animals, leading to substantial concerns for fertility, reproduction and health of the offspring (unrepaired de novo mutations in sperm). Exposure levels are similar to those resulting from wearing a cell phone on the belt, or in the pants pocket, or using a wireless laptop computer on the lap. Sperm lack the ability to repair DNA damage.

Studies of human sperm show genetic (DNA) damage from cell phones on standby mode and wireless laptop use. Impaired sperm quality, motility and viability occur at exposures of 0.00034 uW/cm2 to 0.07 uW/cm2 with a resultant reduction in human male fertility. Sperm cannot repair DNA damage.

Several international laboratories have replicated studies showing adverse effects on sperm quality, motility and pathology in men who use and particularly those who wear a cell phone, PDA or pager on their belt or in a pocket (Agarwal et al, 2008; Agarwal et al, 2009; Wdowiak et al, 2007; De Iuliis et al, 2009; Fejes et al, 2005; Aitken et al, 2005; Kumar, 2012). Other studies conclude that usage of cell phones, exposure to cell phone radiation, or storage of a mobile phone close to the testes of human males affect sperm counts, motility, viability and structure (Aitken et al, 2004; Agarwal et al, 2007; Erogul et al., 2006). Animal studies have demonstrated oxidative and DNA damage, pathological changes in the testes of animals, decreased sperm mobility and viability, and other measures of deleterious damage to the male germ line (Dasdag et al, 1999; Yan et al, 2007; Otitoloju et al, 2010; Salama et al, 2008; Behari et al, 2006; Kumar et al, 2012). There are fewer animal studies that have studied effects of cell phone radiation on female fertility parameters. Panagopoulous et al. 2012 report decreased ovarian development and size of ovaries, and premature cell death of ovarian follicles and nurse cells in *Drosophila melanogaster*. Gul et al (2009) report rats exposed to stand-by level RFR (phones on but not transmitting calls) caused decrease in the number of ovarian follicles in pups born to these exposed dams. Magras and Xenos (1997) reported irreversible infertility in mice after five (5) generations of exposure to RFR at cell phone tower exposure levels of less than one microwatt per centimeter squared (μW/cm2).

EVIDENCE THAT CHILDREN ARE MORE VULNERABLE

There is good evidence to suggest that many toxic exposures to the fetus and very young child have especially detrimental consequences depending on when they occur during critical phases of growth and development (time windows of critical development), where such exposures may lay the seeds of health harm that develops even decades later. Existing FCC and ICNIRP public safety limits seem to be not sufficiently protective of public health, in particular for the young (embryo, fetus, neonate, very young child).

The Presidential Cancer Panel (2010) found that children '*are at special risk due to their smaller body mass and rapid physical development, both of which magnify their vulnerability to known carcinogens, including radiation.*'

The American Academy of Pediatrics, in a letter to Congressman Dennis Kucinich dated 12 December 2012 states "*Children are disproportionately affected by environmental exposures, including cell phone radiation. The differences in bone density and the amount of fluid in a child's brain compared to an adult's brain could allow children to absorb greater quantities of RF energy deeper into their brains than adults. It is essential that any new standards for cell phones or other wireless devices be based on protecting the youngest and most vulnerable populations to ensure they are safeguarded through their lifetimes."*

FETAL AND NEONATAL EFFECTS OF EMF

Fetal (*in-utero*) and early childhood exposures to cell phone radiation and wireless technologies in general may be a risk factor for hyperactivity, learning disorders and behavioral problems in school.

Fetal Development Studies: Effects on the developing fetus from *in-utero* exposure to cell phone radiation have been observed in both human and animal studies since 2006. Divan et

al (2008) found that children born of mothers who used cell phones during pregnancy develop more behavioral problems by the time they have reached school age than children whose mothers did not use cell phones during pregnancy. Children whose mothers used cell phones during pregnancy had 25% more emotional problems, 35% more hyperactivity, 49% more conduct problems and 34% more peer problems
(Divan et al., 2008).

Common sense measures to limit both ELF-EMF and RF EMF in these populations is needed, especially with respect to avoidable exposures like incubators that can be modified; and where education of the pregnant mother with respect to laptop computers, mobile phones and other sources of ELF-EMF and RF EMF are easily instituted.

Sources of fetal and neonatal exposures of concern include cell phone radiation (both paternal use of wireless devices worn on the body and maternal use of wireless phones during pregnancy). Exposure to whole-body RFR from base stations and WI-FI, use of wireless laptops, use of incubators for newborns with excessively high ELF-EMF levels resulting in altered heart rate variability and reduced melatonin levels in newborns, fetal exposures to MRI of the pregnant mother, and greater susceptibility to leukemia and asthma in the child where there have been maternal exposures to ELF-EMF.

A precautionary approach may provide the frame for decision-making where remediation actions have to be realized to prevent high exposures of children and pregnant woman. (Bellieni and Pinto, 2012 – Section 19)

EMF/RFR AS A PLAUSIBLE BIOLGICAL MECHANISM FOR AUTISM (ASD)

- Children with existing neurological problems that include cognitive, learning, attention, memory, or behavioral problems should as much as possible be provided with wired (not wireless) learning, living and sleeping environments,
- Special education classrooms should observe ‘no wireless’ conditions to reduce avoidable stressors that may impede social, academic and behavioral progress.
- All children should reasonably be protected from the physiological stressor of significantly elevated EMF/RFR (wireless in classrooms, or home environments).
- School districts that are now considering all-wireless learning environments should be strongly cautioned that wired environments are likely to provide better learning and teaching environments, and prevent possible adverse health consequences for both students and faculty in the long-term.
- Monitoring of the impacts of wireless technology in learning and care environments should be performed with sophisticated measurement and data analysis techniques that are cognizant of the non-linear impacts of EMF/RFR and of data techniques most appropriate for discerning these impacts.
- There is sufficient scientific evidence to warrant the selection of wired internet, wired classrooms and wired learning devices, rather than making an expensive and potentially health-harming commitment to wireless devices that may have to be substituted out later, and
- Wired classrooms should reasonably be provided to all students who opt-out of wireless environments. (Herbert and Sage, 2012 – Section 20)

Many disrupted physiological processes and impaired behaviors in people with ASDs closely resemble those related to biological and health effects of EMF/RFR exposure. Biomarkers and indicators of disease and their clinical symptoms have striking similarities. Broadly speaking, these types of phenomena can fall into one or more of several classes: a) alteration of genes or gene expression, b) induction of change in brain or organismic development, c) alteration of phenomena modulating systemic and brain function on an ongoing basis throughout the life course (which can include systemic pathophysiology as well as brain-based changes), and d) evidence of functional alteration in domains such as behavior, social interaction and attention known to be challenged in ASD. Several thousand scientific studies over four decades point to serious biological effects and health harm from EMF and RFR. These studies report genotoxicity, single-and double-strand DNA damage, chromatin condensation, loss of DNA repair capacity in human stem cells, reduction in free-radical scavengers (particularly melatonin), abnormal gene transcription, neurotoxicity, carcinogenicity, damage to sperm morphology and function, effects on behavior, and effects on brain development in the fetus of human mothers that use cell phones during pregnancy. Cell phone exposure has been linked to altered fetal brain development and ADHD-like behavior in the offspring of pregnant mice. Reducing life-long health risks begins in the earliest stages of embryonic and fetal development, is accelerated for the infant and very young child compared to adults, and is not complete in young people (as far as brain and nervous system maturation) until the early 20′s. Windows of critical development mean that risk factors once laid down in the cells, or in epigenetic changes in the genome may have grave and life-long consequences for health or illness for every individual.
All relevant environmental conditions, including EMF and RFR, which can degrade the human genome, and impair normal health and development of species including homo sapiens, should be given weight in defining and implementing prudent, precautionary actions to protect public health.
Allostatic load in autism and autistic decompensation – we may be at a tipping point that can be pushed back by removing unnecessary stressors like EMF/RFR and building resilience.

The consequence of ignoring clear evidence of large-scale health risks to global populations, when the risk factors are largely avoidable or preventable is too high a risk to take. With the epidemic of autism (ASD) putting the welfare of children, and their families in peril at a rate of one family in 88, the rate still increasing annually, we cannot afford to ignore this body of evidence. The public needs to know that these risks exist, that transition to wireless should not be presumed safe, and that it is very much worth the effort to minimize exposures that still provide the benefits of technology in learning, but without the threat of health risk and development impairments to learning and behavior in the classroom.
(Herbert and Sage, 2010 – Section 20)

THE BLOOD-BRAIN BARRIER IS AT RISK

The BBB is a protective barrier that prevents the flow of toxins into sensitive brain tissue. Increased permeability of the BBB caused by cell phone RFR may result in neuronal damage. Many research studies show that very low intensity exposures to RFR can affect the blood-

brain barrier (BBB) (mostly animal studies). Summing up the research, it is more probable than unlikely that non-thermal EMF from cell phones and base stations do have effects upon biology. A single 2-hr exposure to cell phone radiation can result in increased leakage of the BBB, and 50 days after exposure, neuronal damage can be seen, and at the later time point also albumin leakage is demonstrated. *The levels of RFR needed to affect the BBB have been shown to be as low as 0.001 W/kg, or less than holding a mobile phone at arm's length. The US FCC standard is 1.6 W/kg; the ICNIRP standard is 2 W/kg of energy (SAR) into brain tissue from cell/cordless phone use. Thus, BBB effects occur at about 1000 times lower RFR exposure levels than the US and ICNIRP limits allow.* (Salford, 2012 – Section 10)

If the blood-brain barrier is vulnerable to serious and on-going damage from wireless exposures, then we should perhaps also be looking at the blood-ocular barrier (that protects the eyes), the blood-placenta barrier (that protects the developing fetus) and the blood-gut barrier (that protects proper digestion and nutrition), and the blood-testes barrier (that protects developing sperm) to see if they too can be damaged by RFR.

EPIDEMIOLOGICAL STUDIES CONSISTENTLY SHOW ELEVATIONS IN RISK OF BRAIN CANCERS

Brain Tumors: There is a consistent pattern of increased risk of glioma and acoustic neuroma associated with use of mobile phones and cordless phones.

"Based on epidemiological studies there is a consistent pattern of increased risk for glioma and acoustic neuroma associated with use of mobile phones and cordless phones. The evidence comes mainly from two study centers, the Hardell group in Sweden and the Interphone Study Group. No consistent pattern of an increased risk is seen for meningioma. A systematic bias in the studies that explains the results would also have been the case for meningioma. The different risk pattern for tumor type strengthens the findings regarding glioma and acoustic neuroma. Meta-analyses of the Hardell group and Interphone studies show an increased risk for glioma and acoustic neuroma. Supportive evidence comes also from anatomical localisation of the tumor to the most exposed area of the brain, cumulative exposure in hours and latency time that all add to the biological relevance of an increased risk. In addition risk calculations based on estimated absorbed dose give strength to the findings. (Hardell, 2012 – Section 11)

"There is reasonable basis to conclude that RF-EMFs are bioactive and have a potential to cause health impacts. There is a consistent pattern of increased risk for glioma and acoustic neuroma associated with use of wireless phones (mobile phones and cordless phones) mainly based on results from case-control studies from the Hardell group and Interphone Final Study results. Epidemiological evidence gives that RF-EMF should be classified as a human carcinogen.

Based on our own research and review of other evidence the existing FCC/IEE and ICNIRP public safety limits and reference levels are not adequate to protect public health. New public health standards and limits are needed.

EVIDENCE FOR GENETIC EFFECTS

Eighty six (86) new papers on genotoxic effects of RFR published between 2007 and mid-2012 are profiled. Of these, 54 (63%) showed effects and 32 (37%) showed no effects.

Forty three (43) new ELF-EMF papers and two static magnetic field papers that report on genotoxic effects of ELF-EMF published between 2007 and mid-2012 are profiled. Of these, 35 (81%) show effects and 8 (19%) show no effect.

EVIDENCE FOR NEUROLOGICAL EFFECTS

One hundred fifty five (155) new papers that report on neurological effects of RFR published between 2007 and mid-2012 are profiled. Of these, 98 (63%) showed effects and 57 (37%) showed no effects.

Sixty nine (69) new ELF-EMF papers (including two static field papers) that report on genotoxic effects of ELF-EMF published between 2007 and mid-2012 are profiled. Of these, 64 (93%) show effects and 5 (7%) show no effect.

EVIDENCE FOR CHILDHOOD CANCERS (LEUKEMIA)

With overall 42 epidemiological studies published to date power frequency EMFs are among the most comprehensively studied environmental factors. Except ionizing radiation no other environmental factor has been as firmly established to increase the risk of childhood leukemia.

Sufficient evidence from epidemiological studies of an increased risk from exposure to EMF (power frequency magnetic fields) that cannot be attributed to chance, bias or confounding. Therefore, according to the rules of IARC such exposures can be classified as a **Group 1 carcinogen (Known Carcinogen).**

There is no other risk factor identified so far for which such unlikely conditions have been put forward to postpone or deny the necessity to take steps towards exposure reduction. As one step in the direction of precaution, measures should be implemented to guarantee that exposure due to transmission and distribution lines is below an average of about 1 mG. This value is arbitrary at present and only supported by the fact that in many studies this level has been chosen as a reference.

Base-station level RFR at levels ranging from less than 0.001 uW/cm2 to 0.05 uW/cm2. In 5 new studies since 2007, researchers report headaches, concentration difficulties and behavioral problems in children and adolescents; and sleep disturbances, headaches and concentration problems in adults.

MELATONIN, BREAST CANCER AND ALZHEIMER'S DISEASE

<u>MELATONIN AND BREAST CANCER</u>

Conclusion: Eleven (11) of the 13 published epidemiologic residential and occupational studies are considered to provide (positive) evidence that high ELF MF exposure can result in decreased melatonin production. The two negative studies had important deficiencies that may certainly have biased the results. There is sufficient evidence to conclude that long-term relatively high ELF MF exposure can result in a decrease in melatonin production. It has not been determined to what extent personal characteristics, e.g., medications, interact with ELF MF exposure in decreasing melatonin production

Conclusion: New research indicates that ELF MF exposure, in vitro, can significantly decrease melatonin activity through effects on MT1, an important melatonin receptor.

ALZHEIMER'S DISEASE

There is strong epidemiologic evidence that exposure to ELF MF is a risk factor for AD. There are now twelve (12) studies of ELF MF exposure and AD or dementia which . Nine (9) of these studies are considered positive and three (3) are considered negative. The three negative studies have serious deficiencies in ELF MF exposure classification that results in subjects with rather low exposure being considered as having significant exposure. There are insufficient studies to formulate an opinion as to whether radiofrequency MF exposure is a risk or protective factor for AD.

There is now evidence that (i) high levels of peripheral amyloid beta are a risk factor for AD and (ii) medium to high ELF MF exposure can increase peripheral amyloid beta. High brain levels of amyloid beta are also a risk factor for AD and medium to high ELF MF exposure to brain cells likely also increases these cells' production of amyloid beta.

There is considerable in vitro and animal evidence that melatonin protects against AD. Therefore it is certainly possible that low levels of melatonin production are associated with an increase in the risk of AD.
(Davanipour and Sobel, 2012 – Section 13)

STRESS PROTEINS AND DNA AS A FRACTAL ANTENNA FOR RFR

DNA acts as a 'fractal antenna' for EMF and RFR.The coiled-coil structure of DNA in the nucleus makes the molecule react like a fractal antenna to a wide range of frequencies. The structure makes DNA particularly vulnerable to EMF damage.
The mechanism involves direct interaction of EMF with the DNA molecule (claims that there are no known mechanisms of interaction are patently false)
Many EMF frequencies in the environment can and do cause DNA changes.
The EMF-activated cellular stress response is an effective protective mechanism for cells exposed to a wide range of EMF frequencies.

EMF stimulates stress proteins (indicating an assault on the cell).

EMF efficiently harms cells at a billion times lower levels than conventional heating.

Safety standards based on heating are irrelevant to protect against EMF-levels of exposure. There is an urgent need to revise EMF exposure standards. Research has shown thresholds are very low (safety standards must be reduced to limit biological responses). Biologically-based EMF safety standards could be developed from the research on the stress response.

EVIDENCE FOR DISRUPTION OF THE MODULATING SIGNAL
HUMAN STEM CELL DNA DOES NOT ADAPT OR REPAIR
Human stem cells do not adapt to chronic exposures to non-thermal microwave (cannot repair damaged DNA), and damage to DNA in genes in other cells generally do not repair as efficiently.

Non-thermal effects of microwaves depend on variety of biological and physical parameters that should be taken into account in setting the safety standards. Emerging evidence suggests that the SAR concept, which has been widely adopted for safety standards, is not useful alone for the evaluation of health risks from non-thermal microwave of mobile communication. Other parameters of exposure, such as frequency, modulation, duration, and dose should be taken into account. Lower intensities are not always less harmful; they may be more harmful. Intensity windows exist, where bioeffects are much more powerful.

A linear, dose-response relationship test is probably invalid for testing of RFR and EMF (as is done in chemicals testing for toxicity).
Resonant frequencies may result in biological effects at very low intensities comparable to base station (cell tower) and other microwave sources used in mobile communications.

These exposures can cause health risk. The current safety standards are insufficient to protect from non-thermal microwave effects.

The data about the effects of microwave at super-low intensities and significant role of duration of exposure in these effects along with the data showing that adverse effects of non-thermal microwave from gsm/UMTS mobile phones depend on carrier frequency and type of the microwave signal suggest that microwave from base-stations/masts, wireless routers, WI-FI and other wireless devices and exposures in common use today can also produce adverse effects at prolonged durations of exposure.

Most of the real signals that are in use in mobile communication have not been tested so far. Very little research has been done with real signals and for durations and intermittences of exposure that are relevant to chronic exposures from mobile communication. In some studies, so-called “mobile communication-like” signals were investigated that in fact were **different** from the real exposures in such important aspects as intensity, carrier frequency, modulation, polarization, duration and intermittence.

New standards should be developed based on knowledge of mechanisms of non-thermal effects. Importantly, because the signals of mobile communication are completely replaced

by other signals faster then once per 10 years, duration comparable with latent period, epidemiologic studies cannot provide basement for cancer risk assessment from upcoming new signals.

In many cases, because of ELF modulation and additional ELF fields created by the microwave sources, for example by mobile phones, it is difficult to distinguish the effects of exposures to ELF and microwave. Therefore, these combined exposures and their possible cancer risks should be considered in combination.

As far as different types of microwave signals (carrier frequency, modulation, polarization, far and near field, intermittence, coherence, *etc.*) may produce different effects, cancer risks should ideally be estimated for each microwave signal separately.

The Precautionary Principle should be implemented while new standards are in progress.

It should be anticipated that some part of the human population, such as children, pregnant women and groups of hypersensitive persons could be especially sensitive to the non-thermal microwave exposures.

N. EFFECTS OF WEAK-FIELD INTERACTIONS ON NON-LINEAR BIOLOGICAL OSCILLATORS AND SYNCHRONIZED NEURAL ACTIVITY

A unifying hypothesis for a plausible biological mechanism to account for very weak field EMF bioeffects other than cancer may lie with weak field interactions of pulsed RFR and ELF-modulated RFR as disrupters of synchronized neural activity. Electrical rhythms in our brains can be influenced by external signals. This is consistent with established weak field effects on coupled biological oscillators in living tissues. Biological systems of the heart, brain and gut are dependent on the cooperative actions of cells that function according to principles of non-linear, coupled biological oscillations for their synchrony, and are dependent on exquisitely timed cues from the environment at vanishingly small levels (Buzsaki, 2006; Strogatz, 2003). The key to synchronization is the joint actions of cells that co-operate electrically – linking populations of biological oscillators that couple together in large arrays and synchronize spontaneously. Synchronous biological oscillations in cells (pacemaker cells) can be disrupted by artificial, exogenous environmental signals, resulting in desynchronization of neural activity that regulates critical functions (including metabolism) in the brain, gut and heart and circadian rhythms governing sleep and hormone cycles (Strogatz, 1987). The brain contains a population of oscillators with distributed natural frequencies, which pull one another into synchrony (the circadian pacemaker cells). Strogatz has addressed the unifying mathematics of biological cycles and external factors disrupt these cycles (Strogatz, 2001, 2003). "*Rhythms can be altered by a wide variety of agents and that these perturbations must seriously alter brain performance"* (Buzsaki, 2006).
"Organisms are biochemically dynamic. They are continuously subjected to time-varying conditions in the form of both extrinsic driving from the environment and intrinsic rhythms generated by specialized cellular clocks within the organism itself. Relevant examples of the

latter are the cardiac pacemaker located at the sinoatrial node in mammalian hearts (1) and the circadian clock residing at the suprachiasmatic nuclei in mammalian brains (2). These rhythm generators are composed of thousands of clock cells that are intrinsically diverse but nevertheless manage to function in a coherent oscillatory state. This is the case, for instance, of the circadian oscillations exhibited by the suprachiasmatic nuclei, the period of which is known to be determined by the mean period of the individual neurons making up the circadian clock (3–7). The mechanisms by which this collective behavior arises remain to be understood." (Strogatz, 2001; Strogatz, 2003)

Synchronous biological oscillations in cells (pacemaker cells) can be disrupted by artificial, exogenous environmental signals, resulting in desynchronization of neural activity that regulates critical functions (including metabolism) in the brain, gut and heart and circadian rhythms governing sleep and hormone cycles. The brain contains a population of oscillators with distributed natural frequencies, which pull one another into synchrony (the circadian pacemaker cells). Strogatz has addressed the unifying mathematics of biological cycles and external factors disrupt these cycles.

EMF AND RFR MAKE CHEMICAL TOXINS MORE HARMFUL

EMF acts on the body like other environmental toxicants do (heavy metals, organic chemicals and pesticides). Both toxic chemicals and EMF may generate free radicals, produce stress proteins and cause indirect damage to DNA. Where there is combined exposure the damages may add or even synergistically interact, and result in worse damage to genes.

EMF IS SUCCESSFULLY USED IN HEALING AND DISEASE TREATMENTS

"The potential application of the up-regulation of the HSP70 gene by both ELF-EMF and nanosecond PEMF in clinical practice would include trauma, surgery, peripheral nerve damage, orthopedic fracture, and vascular graft support, among others. Regardless of pulse design, EMF technology has been shown to be effective in bone healing [5], wound repair [11] and neural regeneration [31,36,48,49,51,63,64,65,66]. In terms of clinical application, EMF-induction of elevated levels of hsp70 protein also confers protection against hypoxia [61] and aid myocardial function and survival [20,22]. Given these results, we are particularly interested in the translational significance of effect vs. efficacy which is not usually reported by designers or investigators of EMF devices. More precise description of EM pulse and sine wave parameters, including the specific EM output sector, will provide consistency and "scientific basis" in reporting findings." "The degree of electromagnetic field-effects on biological systems is known to be dependent on a number of criteria in the waveform pattern of the exposure system used; these include frequency, duration, wave shape, and relative orientation of the fields [6,29,32,33,39,40]. In some cases pulsed fields have demonstrated increased efficacy over static designs [19,21] in both medical and experimental settings."(Madkan et al, 2009)

ELF-EMF AND RFR ARE CLASSIFIED AS POSSIBLE CANCER-CAUSING AGENTS –
WHY ARE GOVERNMENTS NOT ACTING?

The World Health Organization International Agency for Research on Cancer has classified wireless radiofrequency as a Possible Human Carcinogen (May, 2011)*. The designation applies to low-intensity RFR in general, covering all RFR-emitting devices and exposure sources (cell and cordless phones, WI-FI, wireless laptops, wireless hotspots, electronic baby monitors, wireless classroom access points, wireless antenna facilities, etc). The IARC Panel could have chosen to classify RFR as a Group 4 – Not A Carcinogen if the evidence was clear that RFR is not a cancer-causing agent. It could also have found a Group 3 designation was a good interim choice (Insufficient Evidence). IARC did neither.

NEW SAFETY LIMITS MUST BE ESTABLISHED – HEALTH AGENCIES SHOULD ACT NOW

Existing public safety limits (FCC and ICNIRP public safety limits) do not sufficiently protect public health against chronic exposure from very low-intensity exposures. If no mid-course corrections are made to existing and outdated safety limits, such delay will magnify the public health impacts with even more applications of wireless-enabled technologies exposing even greater populations around the world in daily life.

SCIENTIFIC BENCHMARKS FOR HARM PLUS SAFETY MARGIN = NEW SAFETY LIMITS THAT ARE VALID

Health agencies and regulatory agencies that set public safety standards for ELF-EMF and RFR should act now to adopt new, biologically-relevant safety limits that key to the lowest scientific benchmarks for harm coming from the recent studies, plus a lower safety margin. Existing public safety limits are too high by several orders of magnitude, if prevention of bioeffects and minimization or elimination of resulting adverse human health effects. Most safety standards are a thousand times or more too high to protect healthy populations, and even less effective in protecting sensitive subpopulations.

SENSITIVE POPULATIONS MUST BE PROTECTED

Safety standards for sensitive populations will more likely need to be set at lower levels than for healthy adult populations. Sensitive populations include the developing fetus, the infant, children, the elderly, those with pre-existing chronic diseases, and those with developed electrical sensitivity (EHS).

PROTECTING NEW LIFE – INFANTS AND CHILDREN

Strong precautionary action and clear public health warnings are warranted immediately to help prevent a global epidemic of brain tumors resulting from the use of wireless devices (mobile phones and cordless phones). Common sense measures to limit both ELF-EMF and RFR in the fetus and newborn infant (sensitive populations) are needed, especially with respect to avoidable exposures like baby monitors in the crib and baby isolettes (incubators) in hospitals that can be modified; and where education of the pregnant mother with respect to

laptop computers, mobile phones and other sources of ELF-EMF and RFR are easily instituted. Wireless laptops and other wireless devices should be strongly discouraged in schools for children of all ages.

STANDARD OF EVIDENCE FOR JUDGING THE SCIENCE
The standard of evidence for judging the scientific evidence should be based on good public health principles rather than demanding scientific certainty before actions are taken.

WIRELESS WARNINGS FOR ALL
The continued rollout of wireless technologies and devices puts global public health at risk from unrestricted wireless commerce unless new, and far lower exposure limits and strong precautionary warnings for their use are implemented.

EMF AND RFR ARE PREVENTABLE TOXIC EXPOSURES
We have the knowledge and means to save global populations from multi-generational adverse health consequences by reducing both ELF and RFR exposures. Proactive and immediate measures to reduce unnecessary EMF exposures will lower disease burden and rates of premature death.

DEFINING A NEW 'EFFECT LEVEL' FOR RFR
On a precautionary public health basis, a reduction from the BioInitiative 2007 recommendation of 0.1 uW/cm2 (or one-tenth of a microwatt per square centimeter) for cumulative outdoor RFR down to something three orders of magnitude lower (in the low nanowatt per square centimeter range) is justified.
A scientific benchmark of 0.003 uW/cm2 or three nanowatts per centimeter squared for 'lowest observed effect level' for RFR is based on mobile phone base station-level studies. Applying a ten-fold reduction to compensate for the lack of long-term exposure (to provide a safety buffer for chronic exposure, if needed) or for children as a sensitive subpopulation yields a 300 to 600 picowatts per square centimeter precautionary action level. This equates to a 0.3 nanowatts to 0.6 nanowatts per square centimeter as a reasonable, precautionary action level for chronic exposure to pulsed RFR.

These levels may need to change in the future, as new and better studies are completed. We leave room for future studies that may lower or raise today's observed 'effects levels' and should be prepared to accept new information as a guide for new precautionary actions.

http://www.europarl.europa.eu/sides/getDoc.do?language=en&type=IMPRESS&reference=20080903IPR36136

EMF and RF radiation exposure at non-thermal levels. That report has been taken very seriously overseas, together with its recommendation for a drastic lowering of permitted exposures. European Parliament, September2008:

Members of the European Parliament are greatly concerned at the Bio-Initiative international report on electromagnetic fields, which highlights the health risks posed by emissions from mobile-telephony devices such as mobile telephones, UMTS, Wifi, Wimax and Bluetooth, and also DECT landline telephones. It notes that the limits on exposure to electromagnetic fields which have been set for the general public are obsolete.

Dr. Andrew Goldsworthy On Smart Meters

http://inthesenewtimes.com/2010/11/14/andrew-goldsworthy-on-smart-meters/

Dr Andrew Goldsworthy from the UK, has approved mass posting of his recent letters on smart meters addressed to his local MP.

Dear xxxx

I have not yet received a reply to my earlier email on "The Dark Side of Smart Meters" in which I explained how they were a threat to national security by being prone to cyber attack, how they are likely to affect adversely the health of UK citizens, and how they can infringe privacy when configured to detect which kinds of appliance are currently in use. Since these are not trivial matters, I can only assume that you have not received my email, so I am forwarding it again from my Sent Box.

One thing that I did not mention in my original communication, but is very relevant, is that the enforced introduction of wireless smart meters is a clear contravention of the Nuremberg Code (Seehttp://en.wikipedia.org/wiki/Nuremberg_Code) which forbids the performance of experiments on human beings without their consent. Insofar as the long-term safety of continual irradiation from these devices has never been tested and many people (including many eminent scientists) believe that it is potentially harmful, the whole nation is being made a part of an uncontrolled experiment on their electromagnetic safety.

In fact, it doesn't matter whether they turn out to be harmful or not; the fact that the experiment is being performed at all without the expressed permission of the consumer is a contravention of the Nuremberg Code. If we are to adhere to the Code, no consumer should have a wireless smart meter fitted without their voluntary consent after being warned that some scientists believe them to be a health hazard. Furthermore, should the property change hands, any new consumer should have the right to ask for the meter to be removed and replaced by a conventional one.

Please bring this to the attention of the Prime Minister and relevant members of the Cabinet. I am sure that a contravention of the Nuremberg Code, which was drawn up to prevent a repeat of the Nazi atrocities, is something that the Government would not want to be associated with, especially if they really did turn out to be harmful. It would definitely not be a vote winner.

I have copied this email to a number of my friends and colleagues. Perhaps you could reply to us all, since we would all like to know what your personal views are on this, as well as to have confirmation that the information has been passed up to and beyond Cabinet level.

Yours sincerely

Dr Andrew Goldsworthy

— On **Mon, 8/11/10, ANDREW GOLDSWORTHY <*andrew.goldsworthy1@btinternet.com*>** wrote:

From: ANDREW GOLDSWORTHY <andrew.goldsworthy1@btinternet.com>

Subject: The Dark Side of Smart Meters

Date: Monday, 8 November, 2010, 14:57

Wireless Technology, The Worst Threat to Health, Privacy and National Security

By: Jerry Flynn, retired Canadian armed forces Captain, 26 years, electronic warfare, radio warfare, Signals Intelligence

http://thepeoplesinitiative.org/wp/wp-content/uploads/2014/01/Jerry-Flynn-Paper.pdf

This paper is LOADED with pertinent information.

Swisscom International Patents Published Under the Patent Cooperation Treaty (PCT)

http://americanassociationforcellphonesafety.org/uploads/swiss-com.pdf

Swisscom brings forth a very interesting dilemma…they sell products that can cause cancer, birth defects and a myriad of serious health problems, yet they want in on the business of protecting people via EMF mitigating inventions – a potential goldmine…but this entails admitting there is a problem with RF products, which Swisscom formally and publicly denies! Ah the trials and tribulations of a business that thrives at the expense of health and life… what's a Telecom giant to do? What a dilemma! Above is a link to the patent applications for which Swisscom applied to help mitigate RF and below are some of the statements from their patent application.

The influence of electrosmog on the human body is a known problem. The health risk from mobile radio transmitters, handys and DECT telephones has been an explosive subject among the general public at least since the enormous breakthrough in mobile radio technology in the 1990s. To meet the concerns of science from the legislative side, the permissible limit values have thus been lowered several times, and technology has been increasingly focused on this problem. The risk of damage to health through electrosmog has also become better understood as a result of more recent and improved studies. When, for example, human blood cells are irradiated with electromagnetic fields, clear damage to hereditary material has been demonstrated and there have been indications of an increased cancer risk (Mashevich M., Folkman D., Kesar A., Barbul A., Korenstein R., Jerby E., Avivi L., Department of Human Genetics and Molecular Medicine, Tel-Aviv University, Tel-Aviv, Israel, "Exposure of human peripheral blood lymphocytes to electromagnetic fields associated with cellular phones leads to chromosomal instability," *Bioelectromagnetics,* 2003 Feb., 24(2): 82-90). In this study, for example, human peripheral lymphocytes were exposed to continuous electromagnetic fields of 830 MHz in order to examine whether this leads to losses or gains in chromosomes (aneuploidy). Bigger changes lead to instability of the genome (= the totality of all genes of a germinal cell) and thereby to cancer. The human peripheral blood lymphocytes (PBL) were irradiated at different average specific absorption rates (SAR) of 1.6 to 8.8 W/kg over a time period of 72 hours in an exposure system based on a parallel plate resonator in a temperature range of 34.5 to 37.5 °C. The average absorption rate (SAR) and

its distribution in the exposed tissue culture flask were determined by combining the measurement results with a numerical analysis based on a finite element simulation code. A linear increase in the chromosome No. 17 -- an aneuploidy (=numerical chromosome aberration) -- was observed as a function of the SAR, demonstrating that this radiation has a genotoxic effect. The SAR-dependent aneuploidy was accompanied by an abnormal mode of replication of the chromosome 17 region engaged in segregation (repetitive DNA arrays associated with the centromere), suggesting that epigenetic alterations are involved in the SAR dependent genetic toxicity. Control experiments (i.e. without any radio frequency radiation) carried out in the temperature range of 34.5 to 38.5 °C showed that elevated temperature is not associated with either the genetic or epigenetic alterations observed following RF radiation, these alterations being the increased levels of aneuploidy and the modification in replication of the centromeric DNA arrays. These findings indicate that the genotoxic effect of electromagnetic radiation is elicited via a non-thermal pathway. Moreover aneuploidy is to be considered as a known phenomenon in the increase of cancer risk.

Thus it has been possible to show that mobile radio radiation can cause damage to genetic material, in particular in human white blood cells, whereby both the DNA itself is damaged and the number of chromosomes changed. This mutation can consequently lead to increased cancer risk. In particular, it could also be shown that this destruction is not dependent upon temperature increases, i.e. is non-thermal. Based on the scientific studies in the field, and owing to increasing pressure from the public, especially in the industrialized countries, epidemiological studies have been systematized by the World Health Organization (WHO) in the last few years, such as e.g. the currently running WHO Interphone Project, in order to be able to assess more precisely the health risks from electrosmog and work out corresponding guidelines.

ECOLOG - Mobile Telecommunications and Health

A report funded and then buried by: T Mobile

http://americanassociationforcellphonesafety.org/uploads/ecolog_2000_formatted__2_.pdf

The following findings are from T Mobile in the year 2000. They commissioned this report but then attempted to disregard it when the science did not come out in their favor. Here are some excerpts along with the studies the scientists looked to draw their conclusions.

3 Primary Reciprocal Effects between High Frequency Electromagnetic Fields and Biological Systems (Biophysical and Biochemical Processes)

3.1 Thermal Effects

3.1.1 Effects of Homogenous Warming

HF electromagnetic fields are absorbed depending on the frequency and polarisation of the fields on the one hand and the dimensions and material characteristics of the biological system on the other hand. They cause electric currents (dominant in the range under 1 MHz), polarisation effects and potential differences on cell membranes (in the range between 1 MHz and 100 MHz) or trigger rotational oscillations of polar molecules (mainly within the GHz range). All these processes can lead to a warming of the biological material if the intensity is sufficient (Ohmic losses in the low frequency range and dielectrical losses in the GHz range). The avoidance of health damaging warming is the base of the concept of SAR, expressed by limiting the specific absorption rate, measured as the energy absorption per unit, to a rate which will exclude overheating based on the body's own thermo-regulative processes. For humans, a whole body exposure of 0.4 W/kg
corresponds approximately to half the metabolic base rate. In absence of heat conduction or other thermal dissipation, **a SAR of 0.4 W/kg will lead to a temperature rise of 10 4K/sek (Foster 1996) in soft tissue like muscles or the brain.**

3.1.2 Microthermal Effects

The warming through microwaves is fundamentally different from the warming through a water bath for example. In the latter case the energy is transmitted by stochastic collisions. In microwave heating it is in the simplest case the electrical component which puts polar molecules within the medium collectively in vibration (3.2.1). Because of 'friction' with the dense ambient medium, the energy is quickly transmitted to this medium and further dissipated by collisions. When corresponding inner molecular degrees of freedom exist, the microwave energy can also be absorbed as a quantum and, in a large molecule, stored (3.3.). Compared to conventional warming, the absorption of a microwave quantum is a singular

process, which can lead to localised warming if the absorbing molecules are suitably distributed. Liu & Cleary (1995) show in a theoretical model that at the cellular level, membrane bound water can lead to frequency dependent spatial discrepancies in dissipation of the SAR and the induced HF fields. Microthermal effects can also be caused by the non uniformity of thermal conductivity of tissue at microscopic level, especially when the warming is short, strong and local. This is
of importance mainly for the evaluation of pulsed fields, because in such fields, even at a low average power flux density, the energy absorbed during a pulse can be very high. **Radiation in the form of short pulses can lead to a very high rate of temperature rise, which can itself trigger thermoelastic waves, a phenomenon, which is inked to the acoustic perception of microwaves. A high peak SAR can also trigger thermally induced membrane phenomena (Foster 1996).**

3.2 Direct Field Effects

3.2.1 Effects from the Electrical Component of the Electromagnetic Field

The electric component of the electromagnetic field exerts a force on electrical charges, permanent dipole moments, induced dipole moments and higher multipole moments. The forces on charges create currents, however these only play a role in the lower HF range, causing changes in membrane potentials (stimulation) or thermal effects (see above). Permanent charge distributions in biomolecules and cells lead to permanent dipole (or higher multipole) moments. The electrical field exerts a torque on dipoles, which tries to align the dipole moment parallel to the field. In alternating fields with not too high frequencies, the interactions lead to oscillations of the dipoles. In dense media, these oscillations are hindered by interactions with the surrounding particles, which lead to heating (see above). If the particles are too large or the surrounding particle density is too high or if the frequency of the field is too high, the oscillations cannot develop.
The threshold field strengths for the orientation of dipolar cells and other objects of similar size (radius of approx. 1 μm) are at 100 V/m, the cut-off frequencies in water (temperature 300K) are at circa 0.05Hz, hence far outside the HF range. DNA molecules and other bio polymers can be put into oscillation by fields with frequencies in the kHz range. Spherical protein molecules (radius approx. 5nm) can still follow fields with frequencies up to 400 kHz, however this requires field strengths of 106V/m (Foster 1996). Such field strengths are not usually reached in the environment.

The interaction between a field and a particle with an induced dipole moment depends on the field strength to the power of 2, that means, a continuous electrical alternating field influences the particle via a constant torque, however the torque of a modulated field follows the modulation. There is no limitation through a cut off frequency for the interaction between a field and an induced dipole moment, however for frequencies over 1 MHz, the forces exerted on the cells are very small unless field strengths of several thousand V/m are used. With such field strengths however, strong dielectrophoretic forces appear, which can lead to

cell deformations, to the orientation of non spherical cells and to the so called coin roll effect, a stringing together of cells. Since the induced dipole moment depends on the polarizability of the particle and the latter on the size of the particle, even higher field strengths are needed for smaller bodies than cells (biopolymers).

Electric fields can induce electrical potentials on cell membranes. The size of these potentials depends on the electric field strength, the dimensions of the cell, the frequency of the field, the electrical conductivity within and outside of the cell as well as the capacitance of the cell membrane.

With frequencies above 1 MHz the membrane is practically short circuited and the induced membrane potentials become very small. However, theoretical rectification processes and non linear phenomena at the cell membrane have been discussed, and these could lead to an intensification of the effect and to membrane potentials that have an effect on cell physiology.

3.2.2 Effects from the Magnetic Component of the Electromagnetic Field

With some exceptions, biological tissue is not magnetic and the mutual effects between the magnetic component of an electromagnetic field and tissue are generally small. **However, the presence of magnetite crystals, which have a strong capacity to absorb the frequency range of 0.5 to 10 GHz which is relevant for mobile telecommunications, has been found in the human brain as well as in the tissue of many animals (*Kirschvink 1996). Under exposure to amplitude modulated or pulse modulated microwaves, the frequency of the crystal vibrations varies according to the modulation frequency, and thus transmits it, for example in the form of an acoustic wave onto the ambient medium and the cell membrane, which possibly leads to changes of the permeability of the membrane (*Kirschvink 1996).** Theoretical calculations show that magnetite transmitted effects can only occur at high densities of superparamagnetic particles (*Dobson & St. Pierre 1998).

3.3 Quantum Effects

The quantum energy from radio and microwaves in the frequency range between 100 MHz to 10 GHz is far too low to break ionic, covalent or hydrogen bonds. Bohr et al. (*1997) have however shown theoretically, that wring resonances can be triggered in chain molecules. The frequencies of these resonances are in the range from 1 to 10 GHz for proteins and 10 MHz to 10 GHz for DNA molecules. The wring modes of molecules manifest themselves as ‘torsions’ in the molecule chain, which can lead to structural changes.
The influences of microwaves on structural changes in molecules have been found in experiments using the protein ß-Lactoglobuline (*Bohr & Bohr 2000). The triggering of resonant wring modes can even lead to chain breaks, since due to White’s Theory, the added energy can be concentrated in a very limited part of the molecule during structural changes (*Bohr et al.). In this part, the chain can break.

3.4 Other Effects

Resonance Phenomena

When the frequency of the electromagnetic wave meets the natural vibrations in the cell structures or in tissue, it can lead to resonances. Rhythmical fluctuations of signal substances, matter-exchange-processes and Ion-conductivity can be found in many neurones, receptors and cell types. These oscillations can influence the membrane potentials and switch certain stimuli on and off. An external field – according to theory – can imprint an external oscillation frequency onto these structures. **Neurones which have been modified in this way can even synchronise the following neurones in the same way. This external synchronisation would even remain after the disappearance of the external stimulus.**

Indirect Effects:

In addition to the previously described triggering of wring resonances, microwaves canpossibly damage the genetic substance via the formation of hydroxyl radicals. The input energy of microwaves is sufficient to raise the ratio of oxidants to anti oxidants, a self accelerating chain reaction of free radicals can lead to damage of the DNA (Scott 1992, see also Maes et al. 1995).

3.5 Particular Properties of Pulsed Electromagnetic Fields

In an evaluation of circa 40 studies, in which the biological effects of pulsed high frequency fields were directly compared to those of continuous fields of the same median power density, Postow & Swicord (1996) concluded that in half of the studies, the biological effectiveness of pulsed fields was significantly higher. Only in a few studies were the continuous fields more effective and in the remainder of the studies the effectiveness of both was practically the same. The studies which are mainly discussed in chapter 4 and 5 convey a similar picture.

At first glance, the higher biological effectiveness of pulsed electromagnetic fields in comparison to continuous fields at the same median power flux densities could have an almost trivial cause:

The individual pulses of pulse modulated fields have a higher amplitude than the continuous fields; the possible threshold for the triggering of biological reactions could therefore be passed in these fields during the duration of the pulse. However, numerous experiments found that the biological response depends in a complicated manner on the duration of the pulse and its frequency**. Given that some effects have only been observed at certain pulse frequencies, we presume that in addition to the described effect, there are others which can be originally attributed to the low frequency modulation (see also chapter 4).**

4 Biological Primary Effects of High Frequency

Electromagnetic Fields Effects on Cellular Level

At the cellular level, it is possible that there may be direct effects of the EM field on the genetic material, which we have collated under the heading Gene Toxicity and which will manifest as mutations if the cell's own repair mechanisms fail. On the other hand, it is also possible that the fields influence cellular processes such as gene transcription and gene-translation. Furthermore it is possible that the fields can impact on the cell membranes, the intracellular processes of signal transmission and not least the cell cycle. Just like direct damage of the genetic substance, a disruption of these processes can lead to a transformation of the cell, to disruptions of inter cellular communication and to a changed rate of cell division, which can lead to a slower – or very importantly with respect to a potential carcinogenic effect – faster growth.

4.1 Gene Toxicity

A basic question for the evaluation of the potential dangers of mobile telecommunication is whether the electromagnetic fields used are genotoxic. **If the fields had the potential to damage genetic substance directly, they would not only amplify the effects of other carcinogenic teratogenic or mutagenic substances, but they would induce these effects themselves.** A direct genotoxic effect of electromagnetic fields with frequencies as they are used for mobile telecommunications has been thought to be not likely in the past (Brusick et al. 1998, Moulder et al. 1999, Repacholi 1997, Repacholi 1998, Saunders et al.1991, Verschaeve 1995, Verschaeve & Maes 1998). The reasons for this assumption were on the one hand that the quantum energy contained in EM field in the radio and microwave range was not sufficient to break molecular bonds. **This assumption is no longer tenable after the experiments of Bohr et al. (*1997) and Bohr & Bohr (*2000) (see also chapter 3.3).** On the other hand, it was argued that there was a large number of experiments showing no genotoxic effects. **Our list of papers in Annex A, Table A.1 shows however, that the much debated findings of the work of Lai & Singh (*1995), in which the direct damage of DNA (single strand and double strand breaks) has been proven, have been confirmed by a whole range of other studies, some by the same laboratory, but also by other groups (*Lai & Singh 1996, 1997, *Phillips 1998, *Sarkar 1994).** A study by Varma & Traboulay (1977) on the effect of HF fields on pure DNA had already resulted in hints of direct genotoxic effects, however, this experiment used a relatively high power flux density and therefore significant warming may have occurred, at least locally. Lai and Singh (*1997) found that the dispensation of melatonin and N-Tert-Butylalpha-Phenylnitron (PBN) before the EMF exposure prevented the occurrence of DNA breaks. Melatonin captures free radicals and for PBN it has been proven that it protects cells from cell death induced by free radicals. In Appendix Table A.1 we also list the experiment of Meltz et al. (*1987) and Stagg et al. (*1997) which examined the influences of EMF fields on the DNA repair mechanisms and the DNA synthesis. The term chromosome aberration sums up all anomalies of the DNA double strand level with respect to chromatids and chromosomes. Examples for structural chromosome aberrations are: chromatid and chromosome breaks, chromatid gaps, acentric fragments as well as di- and tetracentric chromosomes. **Chromosome aberrations have been observed in a multitude of experimental conditions, in vivo as well as in vitro (Table A.1). Maes et al.(*1997) found a rise of chromosome aberrations in human**

lymphocytes in workers who were professionally exposed to radiation from mobile equipment, but also in experiments with human blood under controlled exposure conditions (GSM base station, 15 W/mÇ, exposure time of 2 hours). However, this was the only study so far which used the actual fields of a real base station. **The incidence of micronuclei indicates whether the distribution of chromosomes into the daughter nuclei after a cell division has been normal and complete. A number of studies have proven a higher incidence of micronuclei under the influence of HF EMF fields, which is interpreted as an indication for chromosome damage (Table A.1).** With one exception, the frequencies were all over 1 GHz and in most cases the intensities were relatively high. For the incidence of sister chromatid exchange as a measure for damage at DNA single strand level, only very few studies using typical mobile frequencies and intensities have been done so far (Table A.1). **Maes et al.(*1996) found that the radiation of a GSM base station (954 MHz, 217 Hz, duration of exposure: 2 hours) raises the genotoxic effects of Mitomycin C significantly, demonstrated via the sister chromatid exchange. Genetic damage can lead to cell mutation with possibly damaging effects for the living organism. Mutations which promote faster cell division will be discussed in chapter 4.3. Table A.1 shows in its last block some studies which focussed on the evidence of changes in the genetic materials which manifest themselves as changed properties within the organism.**

4.2 Cellular Processes

4.2.1 Gene-Transcription and Gene-Translation

The code of the DNA controls protein synthesis in the ribosomes via the RNA. The creation of RNA, i.e. the imprinting of genetic information happens in the cell nucleus (transcription). The encoded information is transported via messenger RNA (M RNA) to the ribosomes and is read there with the help of Transfer RNA (t RNA). According to the transmitted code, proteins are subsequently synthesized. This process of synthesis is called translation. Since one m RNA chain can be used by several ribosomes, the rate of synthesis of the corresponding protein can be a lot higher than that of the m RNA. Mistakes made during the genetic transcription can thus be ‘raised to a higher power’ at the protein level.
In the first block of Appendix Table A.2, we list several recent studies which demonstrated changes of gene transcription and translation under the influence of electromagnetic fields of mobile telecommunications. Fritze et al. (*1997) observed changed gene transcription in certain areas of the brains of rats which had been exposed to the field of a GSM phone for four hours.
In an in vitro experiment, Ivaschuk et al. (*1997) exposed cells to a pulse modulated HF field (836.55 MHz, TDMA 50Hz) and afterwards extracted and analysed the entire cellular RNA. This showed statistically significant changes with regards to the transcription of the response gene c jun (90W/mÇ, duration of exposure: 20 minutes), however no changes with regards to c fos. **The results of the experiments by Goswami et al. (*1999) found a evidence for an influence on the transcription of the response gene c fos by a similar field, whilst for c jun a**nd c myc, no statistically significant effect was

observed. **The intensities at which effects on gene translation had been observed were well below the values at which thermal effects would occur in mammals.**

4.2.2 Membrane Function

There is a large number of experimental evidence that high frequency fields, non-pulsed and pulsed can affect different properties of the ion channels in cell membranes, for example in the form of a lowering of the rate of channel formation or the reduction of frequency of the opening of individual channels (Repacholi 1998). The frequency of openings of ion channels which are activated by acetylcholine was significantly lowered by a microwave field (10.75 GHz) with a power flux density of a few µW/cmÇ. (*D'Inzeo et al.1988). Changes of the membranes as a whole have also been observed under the influence of weak fields. Thus, Phelan et al. (*1992) observed that a 2.45 GHz field, with a pulse modulation of 100 Hz could trigger a phase transition from liquid to solid in melatonin containing cells after an exposure of 1 hour at a SAR of 0.2 W/kg.

4.2.3 Signal Transduction

Ca2+

The divalent Calcium cation Ca2+ plays an important role in the cell-signal-transduction: regulating the energy output, the cellular metabolism and the phenotypical expression of cell characteristics.

The signal function of the Ca2+ is based on a complicated network of cellular channels and transport mechanisms, which maintains the Ca2+ concentration within the cell at a lower level than outside, but which is also linked to dynamic reservoirs. This allows the transduction of extracellular signals (hormones, growth factors) as Ca2+ peaks in the cytosol, transmitting information encoded in their intensity and frequency. It is known that this signal process can be disrupted by a variety of toxic chemicals in the environment, which can lead to cell damage and even cell death (Kass & Orrenius 1999). Studies by Bawin et al. **(*1975) and Blackman et al. (*1979) showed very early on in vitro experiments that the Ca2+ balance of nerve cells and brain tissue can be disrupted by HF fields with low frequency amplitude modulations.**

Both studies worked with amplitude modulated 147 MHz fields (with intensities ranging from 5 to 20 W/m2). **The maximum effect occurred at a modulation frequency of 16 Hz. Experiments conducted by Dutta et al. (*1984 *1989) and Lin-Liu & Adey (*1982) also showed significant dependence on the modulation frequencies, in some cases at Specific Absorption Rates of as low as 0.5 W/kg. Equally, Somosy et al. (*1993) found that an effect on the distribution of Ca in intestinal cells is only possible within a field modulated with a low frequency. Wolke et al. (*1996) observed in their experiment on myocytes that exposure to fields with mobile-like carrier frequencies of 900 MHz and 1800 MHz resulted in lower intracellular concentrations of Ca2+ for all modulation frequencies (16 Hz, 50 Hz, 217 Hz, 30 KHz)** compared to exposures to a continuous 900 MHz field or no exposure at all. **A statistically significant effect was only found with the combination of a carrier wave of 900MHz and a modulation frequency of 50 Hz. The Specific Absorption Rate for this experiment was between 0.01 and 0.034 W/kg, far below the range which might be relevant for 'thermal' effects.**

Enzymes

Protein kinases are enzymes with the property to phosphorylate other enzymes or proteins. Phosphorylation, a covalent modification by addition of a phosphate group, changes the activity or function of a protein. The protein kinases play an important role in the transmission of information from the membrane receptors for hormones and cytokines into the interior of the cell, and thus in the regulation of many intracellular processes such as glucose and lipid metabolisms, protein synthesis, membrane permeability, enzyme intake and transformation by viruses.

An amplitude modulated 450 MHz field is capable of decreasing the activity of protein kinases which are not activated by cyclical Adenosine monophosphate. Byus et al. (*1984) showed that the degree of inactivity depended on the exposure time as well as the modulation frequency. Maximum effects occurred at exposure times of 15 to 30 minutes with a modulation frequency of 16 Hz.

The enzyme ornithine decarboxylase (ODC) determines the speed of the biosynthesis of polyamines. Polyamines are needed for DNA synthesis and cell growth. ODC is also activated in relation to carcinogenesis. The control of OCD activity from the exterior is facilitated via processes on the cell membrane. Byus et al. (*1988) exposed three different cell types (rat hepatoma cells, egg cells of the Chinese hamster, human melanoma cells) for one hour to a 450 MHz field with a 16 Hz amplitude modulation and a power flux density of 10W/m2. **The exposure raised ODC activity by a little more than 50%. The heightened ODC activity remained for several hours after the exposure**. Similar fields with a 60 Hz and a 100 Hz modulation had no effects. **Another study (*Penafiel et al. 1997) observed heightened ODC activity after the radiation of L929 cells of mice with a 835 MHz field which had been amplitude modulated at 60Hz or pulse modulated at 50Hz.** No effects whatsoever were observed with an analogue mobile phone, a frequency modulation at 60 Hz and a speech amplitude modulation. This last finding confirms other results by the same group, according to which a minimum coherence time of 10 seconds of the field needs to be present for an effect on ODC activity to manifest (*Litovitz et al.1993, 1997, see also Glaser 1998 and Litovitz 1998). The coherence time of speech modulated fields however is shorter than a second.

Further important proof that low frequency modulation has a determining influence on the effects of electromagnetic fields on enzyme activity was found by Dutta et al. (*1994):

They compared the effects of a low frequency modulated 147 Hz field (0.05 W/kg) and a combined low frequency electric and magnetic field (ELF EM, 21.2V/97nT**). A continuous high frequency field only had a small effect (3.6 per cent) on the activity of enolase in Escheria Coli, a 16 Hz modulated field led to an increase in activity of nearly 62 per cent, a 60 Hz modulated field led to a decrease of activity of 28.5 per cent. At ELF EM a similar response could be observed: increase of enzyme activity by more than 59 per cent at a frequency of 16 Hz and decrease of 24 per cent at 60 Hz.** The results of the experiments by

Behari et al.(*1998) point in the same direction. **They found that a 30 to 35 day long**

exposure of rats to amplitude modulated fields (6.11 – 9.65 W/kg) led to a significant increase in Na+ K+ ATPase activity, which was independent from the carrier frequency, but characteristically dependent on the modulation frequency, because the effect was always stronger at a 16 Hz modulation than at a 76 Hz modulation.

4.2.4 Cell Cycle

An undisrupted signal transduction or efficient cell cycle control mechanisms which are capable of correcting false information or facilitating repairs are the prerequisite for cell cycle progression if the genomic integrity of the cell is to be maintained (Shackelford et al. 1999). Disturbances of the DNA replication can lead to detrimental mutations and as a consequence to cell death or in multicellular organisms to cancer. The causes for irregularities in the course of the cell cycle are almost always to be found in mistakes during signal transduction and/or the failure of control mechanisms.
In Appendix Table A.2. we list studies which examined disruption of the cell cycle. The only in vivo experiment is the one by Mankowska et al. (*1979) which also used intensities as they are found in the environment of real emitting equipment**. Statistically significant increases of disrupted metaphases with uni, quadri and hexavalencies were demonstrated in this study from a power flux density of 5 W/m2. Cleary et al. (81996) found in their experiment that 2.45 GHz fields are roughly twice as effective as 27 MHz fields when it comes to the triggering of cell cycle disturbances. Whilst the 27 MHz fields had no influence on the G2/M phase of egg cells of the Chinese hamster, disturbances of all phases were observed in a 2.45 GHz field.**

4.3 Cell Transformation and Cell Proliferation

In vitro experiments of the effects of high frequency fields on the rate or division or the rate of proliferation of cells, expressed in the proliferation rate and the (neoplastic) transformation of cells can offer important findings with regards to possible carcinogenic effects of the fields. **The adverse influences of the fields which could not be prevented by the cell's own repair mechanisms manifest themselves in disrupted cell proliferation and cell transformation rates.**
Table A.3 gives an overview of the studies, in which the effects of high frequency fields on cell transformation and cell proliferation rates were the focus of the examinations.

4.3.1 Cell Transformation

Balzer Kubiczek & Harrison (*1985, *1989, *1991) found an increase in neoplastic transformations in cells which had been exposed in vitro to a high frequency field with a low frequency pulse. The effect depended on intensity, but was only observable, if a tumour promoter (TPA) was added after the exposure. Czerska et al. (*1992) found that low frequency pulsed microwave radiation (2.45 GHz) increased the rate of transformation of small inactive lymphocytes into large activated lymphoblasts. Continuous radiation could trigger this effect only at power flux densities that also led to measurable warming. However, the experiments with pulsed radiation which triggered the cell transformation at power flux densities, for which a homogenous warming can be

ruled out, showed that **homogenous warming cannot be responsible for this effect.**

4.3.2 Cell Communication

Disrupted communication between transformed cells and normal cells plays an important role in tumor promotion. Cain et al. (*1997) co cultivated transformed cells with normal cells. The co-culture was exposed for 28 days to a TDMA (50Hz) modulated 836.55 MHz field as well as to the tumor promoter TPA in various concentrations. At power flux densities of 3 and 30 W/m2, which corresponded to Specific Absorption Rates of 1.5 and 15 mW/kg, they did not find a statistically significant difference of focus formation between the exposed and the control cultures for any of the TPA concentrations. **The data for the lowest intensity (0.3 W/m2/0.15 mW/kg) show for two of the three TPA concentrations that there was a small but statistically significant difference in the number of foci, and for the lowest TPA concentration also for the surface and density of the foci.**

4.3.3 Cell Proliferation

Anderstam et al. (*1983) found in their experiments with bacteria that some strains reacted to the exposure with an amplitude modulated 2.45 GHz field (500Hz, 35 to 100 W/kg) with an increased proliferation. Also for some species, the number of mutations and the frequency of mutations were increased. These results were confirmed by Hamnerius et al. (*1985) amongst others. Grospietsch et al. (1995) found similar results for 150 MHz fields with several amplitude modulations. Cleary et al. (*1990 a,b) demonstrated on human lymphocytes and on Glioma cells that the rate of cell division was increased after exposure with a continuous 2.45 GHz field. In a newer experiment, the same effect could be observed for exposures with a pulse modulated field of the same carrier frequency (*Cleary et al. 1996). In the first of the two experiments which were conducted with fields displaying all the characteristics of real pulsed mobile emissions (see also Table A.3), an increased DNA synthesis rate was observed, but no faster proliferation of the examined cells was found. (*Stagg et al. 1997). In the second experiment, at similarly low intensities (0.0021 W/kg) however, transmitted by a GSM modulated 960 MHz wave, an increase of the cell proliferation rate was found (*Velizarov et al. 1999). The EMF exposure in this experiment was conducted at two different temperatures, which also applied to the relating control cultures. **The increase of the proliferation rate only happened in the exposed cell cultures.**

Similar experiments to prove that microwaves and ‘conventional’ heat have different effects, were conducted by La Cara et al. (*1999) on a thermophile bacterium, in which the radiation with a 10.4 GHz field led to an irreversible inactivation of the thermostable enzyme ß galactosidase, whilst heating in a water bath had no effect. **This result confirmed the results of Saffer & Profenno (*1992) which had worked with frequencies in the lower GHz range.**

5 Patho-Physiological Effects

5.1 Immune System

The immune system plays a central role in the protection against infectious microorganisms in the environment and, also, against several kinds of cancer cells. Experiments on hamsters, mice and rats found, amongst other things, that there was a reduction in the activity of natural killer cells and an increase in macrophage activity (see e.g. Yang et al. 1983; Ramo Rao et al. 1983; Smialowicz et al. 1983). However, the majority of experiments on living animals were carried out at power flux density levels that produced an increase in body temperature of more than 1oC. On the other hand, it was observed in parallel in vitro experiments, that in vitro heating of macrophages did indeed lead to increased activity; the effect was, however, weaker than that of the in vivo radiation which produced the same temperature (Ramo Rao et al. 1983). **Elekes et al. (*1996) observed that, after exposing mice for a period of 3 hours per day over several days using microwaves (2.45 GHz) with a power flux density of 1W/m2 (SAR = 0.14 W/kg), there was an increase in antibody producing cells in the spleen of about 37% with continuous radiation and around 55% with amplitude modulated radiation.**

In contrast to the in vivo experiments, numerous in vitro experiments were carried out with intensities at which an effect due to warming can be excluded. **Thus, Lyle et al. (*1983) observed an inhibition of cytotoxicity of T Lymphocytes in the mouse with a 450 MHz field that was amplitude modulated with various frequencies in the range between 3Hz to 100 Hz. The effect that was demonstrated with a relatively low power flux density of 15 W/m$_2$ was greatest at the 60 Hz modulation. The inhibition of cytotoxic effectiveness of the irradiated lymphocytes declined continually for both the lower and higher modulation frequencies.**

The tables in Appendix A list further experiments with (human) leucocytes in which damaging effects were proven at non thermal power flux density levels, especially also with low frequency amplitude modulated fields. The work of Maes et al.(*1995) deserves special consideration. **In an in vitro experiment with human leucocytes at a GSM base station and also in the examination of the lymphocytes in the blood of workers who were exposed to the fields of the mobile phone base stations during maintenance work, they found that there was an increase in chromosome damage (chromatid breakage, acentric fragments and some chromosome breaks).**

5.2 Central Nervous System

5.2.1 Blood Brain Barrier

The brain of mammals is protected from potentially dangerous materials in the blood by the blood brain barrier, a specialized neurovascular complex. The blood brain barrier functions as a selective hydrophobic filter that can only be easily passed through by small fat soluble molecules. Other non fat soluble molecules, e.g. glucose, can pass through the filter with the help of carrier proteins that have a high affinity for specific molecules.

It is known that a large number of disorders of the central nervous system are caused by disturbances of the barrier function of the blood brain barrier (*Salford et al. 1994). Severe warming of the brain can lead to an increased permeability of the blood brain barrier for those materials whose passage should actually be prevented. **The results of first experiments with high frequency fields of high intensity, which led to a higher**

permeability of the blood brain barrier, were then interpreted as a consequence of warming by the HF radiation. However, Appendix Table B.1 lists a whole series of studies in which a greatly increased permeability of the blood brain barrier was produced through pulsed high frequency fields of very low intensity (*Oscar & Hawkins 1977, *Neubauer et al. 1990, *Salford et al.1994, *Fritze et al.1997) amongst others with carrier frequencies and modulation frequencies which corresponded to those of mobile telephony (GSM).

5.2.2 Neurotransmitters

Pulsed and continuous high frequency fields of low intensity may lead to chemical changes in the brain. Inaba et al. (*1992) exposed rats to a continuous 2.45 GHz field with a power flux density of between 50 to 100 W/m2 and found a significant reduction in the Noradrenalin content of the Hypothalamus, whilst the two other neurotransmitters

Dihydroxyphenylacetic acid and 5 Hydroxyindolacetic acid were found in the pons and medulla oblongata in significantly increased concentrations. The radiation did not produce significant changes in the dopamine or serotonin concentrations. **Lai et al. (*1987, 1989 a, b, see above Lai et al. 1988) found also in experiments using rats that a 2.45 GHz field modulated with 500 Hz pulse modulation influences brain activity, especially in the frontal cortex and the hippocampus, via the most important parasympathetic neurotransmitter acetylcholine. It could be demonstrated that the effect was related to the exposure duration. A 45 minute exposure duration led to significant reductions in choline-uptake, the reduction to 20 minutes exposure produced a significant increase. A similar behaviour was found in animals also as a reaction to stress through the reduction of the freedom of movement and through acoustic white noise.**

5.2.3 Electroencephalogram (EEG)

In contrast to the neuroendocrine effects, which can barely be measured directly in the brain of humans, EEG studies can be carried out relatively easily. Several valid studies of that kind do now exist.

Most animal experiments have limited validity, since they were carried out with relatively high power flux density values (see e.g. Chizhenkova 1988: 2.397 MHz, cw, 400 W/m2, Chizhenkova & Safroshkina 1996: 799 MHz, cw, 400 W/m2, Thuroczy et al. 1994; 2.45 GHz, AM 16 Hz, 100 W/m2**). One of the few exceptions are the studies by Vorobyov et al. (*1997), who observed an increase on the left right symmetry in the EEG in rats that were exposed to a 945 MHz field (AM, 4Hz, 1 to 2 W/m2, within the first 20 seconds after the start of the exposure.** Early experiments by von Klitzing (1995) with EEG recording during the exposure of

subjects to pulsed high frequency fields, that were similar to those of mobile telephone fields (150 MHz, 217 Hz, power flux density in the pulse in the brain at a 6 cm depth below 10-2 W/m2), found changes in the awake EEG, these were called into question because of insufficient documentation. **In later experiments however, a clear effect was demonstrated in the awake and sleeping EEGs. Reiser et al. (*1995) observed, both with exposures to a 150 MHz field (modulated frequency 9.6 Hz, peak power 0.5 mW, 4 cm distance, near-field conditions) and also in the field of a mobile telephone (902 MHz,**

modulation frequency 217 Hz, peak power 8W, 40 cm distance), a significant increase in the energy in the EEG frequency bands – Alpha, Beta 1 and Beta 2.
Experiments by Röschke & Mann (*1997) resulted in no significant difference in the EEGs for exposed and sham exposed subjects under short exposure conditions (3.5 minutes, 900 MHz, GSM, 0.5 W/m2). **However, the peak of approx. 9Hz in the presented averaged power density spectra of exposed subjects was clearly lower and narrower than for nonexposed subjects. The same authors (*Mann & Röschke 1996) demonstrated again in the field of a GSM mobile telephone (8W, distance 40 cm power flux density 0.5 W/ m2), a reduction of the time taken to fall asleep and a statistically significant reduction of the**
duration and the proportion of the REM sleep. Furthermore, the spectral analysis revealed an increased power density of the EEG signal during REM sleep above all in the 'Alpha' frequency band. The REM suppressive effect and the reduction of the time taken to fall asleep were also confirmed by the same research team (*Mann et al.1997, *Wagner et al. 1998). The study carried out in 1997 also found a significant increase in the cortisol concentration in the blood of humans exposed to a 900 MHz/217 Hz field with a power flux density value of 0.2 W/m2. Systematic deviations were also observed for the Growth
Hormone and Melatonin levels, but these did not reach significance level.
Whilst in the previously cited studies, changes in the sleep EEG could be demonstrated only as a consequence of the influence of mobile telecommunications fields for several hours, Borbély et al. (1999) were able to demonstrate that changes in sleep were already occurring after 15 to 30 minutes exposure. This research team used also a 900 MHz field, which could be selectively pulse modulated with either 2, 8, 217 or 1736 Hz. As in the other experiments, a statistically significant reduction in the proportion of REM sleep was found at a Specific Absorption Rate of less than 1W/kg. In addition, the waking up phase was noticeably reduced. Freude et al. (*1998, see also Henschel et al. 1999) examined the effect of the radiation from mobile telephones on slow brain potentials. Slow brain potentials are event correlated brain potentials that arise during the preparation for motor action and/or information processing. Changes in the slow brain potentials give an indication about the influences on specific aspects of human information processing. **Freude et al. found that the fields of a mobile telephone (916.2 MHz, 217 Hz, SAR 0.882 1.42 W/ kg, exposure time 3 to 5 minutes) led to a statistically**
significant decrease of the slow readiness potentials for specific tasks, in specific brain areas.

5.2.4 Cognitive Functions

Impairments of the brain, e.g. by modification of the choline-uptake, can be expected to cause learning deficits. These were demonstrated in many learning experiments, in which rats were previously exposed to pulsed microwave fields (*Lai et al. 1989, 1994; *Wong & Lai 2000, see above D'Andrea 1999 for older studies). In the study by Lai et al. (*1994), rats were exposed for 45 minutes to a 500 Hz pulsed 2.45 GHz field with a power flux density of 10 W/m2. This intensity resulted in a mean whole body SAR of 0.6

W/kg. Following the exposure, the starved rats were placed in a labyrinth with several arms in which food was placed. The researchers measured how effectively the 'exposed rats' and the 'shamexposed rats' searched the labyrinth for food. **For the 'exposed' group, significantly more failed attempts were observed, i.e. searching already emptied labyrinth arms. The authors attributed the low performance of the 'exposed' rats to deficits in spatial memory. The 'handicap' of the EMF exposure could be levelled out in a follow-up experiment, in which the rats were given either the acetylcholine agonist Physostigmin or the opiate antagonist Naltrexone before their exposure. According to the authors, these findings are confirmation of their results from previous studies (see above), in which they had found that high frequency electromagnetic fields influence cholinergic and endogenous opioid neurotransmitter systems in the brain and that this effect can lead to memory deficits. In the meantime, the effect has been confirmed by other experiments (Mickley & Cobb 1998).**

In a further experiment (*Wang & Lai 2000), rats were trained over several sessions to find a platform situated just under the water surface inside a round water basin. Subsequently, they were exposed to pulsed microwave radiation for an hour (2.45 GHz, 500 pulses per second, mean power flux density 2W/m2, mean whole body SAR 1.2 W/kg). Testing was then carried out to determine how long the 'exposed rats' needed to find the platform from different starting positions, compared to the 'non exposed rats' or 'sham exposed rats'. **The 'exposed rats' clearly required longer for this, as they spent significantly less time in the correct quadrant of the water basin. Finally, the recorded traces of the swimming lanes used by the 'exposed animals' differed from those of the control groups, this suggests that different strategies were used when searching for the platform. This result confirms the findings from other studies that pulsed high frequency fields can influence specific aspects of memory performance. The effects of a 600 MHz field on the memory of rats were also demonstrated by Mickley et al. (*1994). In this experiment, the capacity of the animals to recognize familiar objects was measured in relation to the radiation they received. Whilst the 'non-exposed control animals and also the animals who were exposed to a SAR of 0.1 W/kg occupied themselves for longer with a novel object compared to a familiar object, the higher exposed animals spent just as much time examining an actually familiar object as with a novel object.** The limit for this exposure dependent change in behaviour was between 0.1 and 1.0 W/kg **The lowest SAR so far which has been shown to have an effect on cognitive functioning in rats was 0.072 W/kg**. However, in this experiment, pulses with a peak of more than 700 MW (megawatts) were used (Raslear et al. 1993). The low SAR in this case resulted only from averaging over time with a very low pulse repetition rate of 0.125 pulses per second and a pulse width of only 80 nsec. **It has been shown in experiments by Preece et al. (*1999) that fields like those used in mobile telephony can influence cognitive functions of the brain.** In this study, 36 subjects were subjected to a 915 MHz field of a simulated mobile telephone. The field was overlaid either with a 217 Hz sinusoidal modulation or a 217 Hz pulse modulation. In the analogue simulation the net forward power was about one Watt, and in the digital simulation it was 0.125 Watt. Under the conditions 'Exposure to analogue field', 'Exposure to digital field' or 'Sham exposure without any

field', each of the test persons had to carry out several tests to measure ability to react and various tests of memory performance. **In both exposed groups there was a slight but statistically significant decrease in reaction time, which was more marked for 'Analogue exposure' than for 'Digital exposure'.**

5.3 Hormone Systems

5.3.1 Stress Hormones

Environmental pollution can act as a stressor on the body, like physical and mental stressors, and cause 'alarm reactions'. Such reactions are associated with hormonal changes. The presence of a stress situation can be proved by the presence of hormones like adrenocorticotropin [the adrenocorticotrophic hormone] (ACTH), cortisol and corticosterone in the blood, and also to a lesser extent by changes in the concentration of prolactin and growth hormone.

Electromagnetic fields can clearly cause stress reactions in animals used for experiments. Thus, the experiment by Imaida et al. (*1998a) on rats that were exposed for a duration of 90 minutes daily over a period of 6 weeks to a field with a carrier frequency of 929.9MHz and a 50 Hz pulse modulation, showed a statistically significant increase in the ACTH and corticosterone levels. The whole body SAR value in this experiment was between 0.58 and 0.8 W/kg. The exposure in the 1.439 GHz field, equally with a 50 Hz pulse modulation and a SAR value between 0.453 and 0.680 W/kg had the same effect (*Imaida et al. 1998b). Chou et al. (*1992) exposed rats in a long term experiment (25 months) to 800 MHz pulsemodulated 2.45 GHz field that led to a Specific Absorption Rate of 0.15 to 0.4 W/kg.

Alongside other physiological parameters the corticosterone profile was regularly measured for the first half year of the experiment. Whilst the hormone profile of the exposed animals and the non exposed animals were practically identical in the later stages of the experiment, with the exception of a slight increase in the sham-exposed group of animals in the third phase of the experiment, **the first examination after 6 week's exposure showed a statistically significant increase in the corticosterone profile in the blood of the exposed animals.**

The authors report that their attempt to replicate this effect produced no statistically significant results, however, only 20 animals were tested in this second experiment whilst the actual series of experiments contained 200 animals.

A similarly extensive experiment on rats like that of Chou et al. However, with an unmodulated 435 MHz field showed no difference in the concentration of the hormones ACTH, corticosterone and prolactin between the exposed animals and the non-exposed animals (Toler et al. 1988).

The few experiments previously carried out on humans do not yet produce a clear picture. Mann et al. (*1998) exposed 24 volunteer subjects whilst asleep to the field of a mobile telephone that was transmitted from a separate antenna (900 MHz, 217 Hz, 0.2 W/ m2). Blood samples were withdrawn via a catheter whilst the subjects were asleep and they were analysed for, amongst other things, cortisol and growth hormone concentrations**. There were**

systematic differences between the 'exposed subjects' and the 'sham-exposed subjects' during the course of the night for both hormones, which only reached statistical significance levels for cortisol.
De Seze et al. (*1998) examined the effect of a GSM mobile telephone (900MHz, 217 Hz) on subjects who were exposed to the field for 2 hours per day, 5 days per week for over a month. Based on nine blood sample withdrawals per week; amongst other things, the change in the concentrations of ACTH, growth hormone and prolactin were determined over time. The authors' evaluation of their studies was that at one month, intermittent exposure in the radio frequent field from the mobile telephone had no lasting or accumulative effects on the hormone secretions from the anterior lobe of the pituitary gland. **In their data, it is however noticeable that that ACTH and prolactin follow a quite similar profile over time: the concentrations started at high initial values at the start of the exposure and then decreased in the following 3 weeks, and they then rose slightly again.** The growth hormone concentrations are very high for the first measurements during the exposure period, they then fall to the pre exposure concentration levels and maintain these levels until the end of the experiment. Possibly, these measurements show a temporary stress reaction, which reduced in the following weeks.

5.3.2 Melatonin

The hormone melatonin, which is produced in the pineal gland, functions as a regulating hormonal signal that synchronizes the endocrine rhythms of all the hormone glands. It regulates, amongst other things, the daily cycles of ACTH and the cortisol-release and thereby regulates the daily rhythms of many metabolic processes.
Melatonin also exerts influences (inhibitory) on sex hormones and it has a stimulatory effect on the immune system. Melatonin also influences specific cancer illnesses via the regulation of the release of the sex hormones. In addition, melatonin is a free radical scavenger, inactivating radicals such as OH, which amongst other things can be dangerous for the genetic material. Furthermore, during in vivo experiments, it was demonstrated that melatonin hinders changes in DNA produced by chemical carcinogens and it protects lymphocytes from chromosome damage in high frequency electromagnetic fields (*Lai & Singh 1997).
In the previously described experiments carried out by Imaida et al.(*1998 a, b), it was found that the experimental animals that were exposed to a pulse-modulated high frequency field had a reduced melatonin concentrations in the blood. This finding could not be confirmed by Heikkinen et al. (1999), who exposed mice for 17 months to a 900 MHz field with a 217 Hz GSM pulse modulation (SAR: 0.35 to 1.5 W/kg). Studies by Vollrath et al. (1997) using rats and hamsters with a 900 MHz field (217 Hz GSM, SAR: 0.04 to 0.36 W/kg) could not contribute much to the clarification of the problem, since in several sub-sets of the experiment statistically significant differences between 'exposed animals' and 'non-exposed animals' had been found, but according to the authors these resulted from mistakes in the experimental order.
In experiments by Mann et al. (*1997 see above), the stress hormones were measured as well as the serum melatonin profile. This showed, in the case of the exposed humans, that for a

period of between 3 to 4 hours in the middle of the night there was an increase compared to the control values, but these were not statistically significant according to the evaluation of the authors.

6 Pathological Effects

6.1 Results of Experimental Studies

6.1.1 Cancer

Carcinogenesis

Carcinogenesis is a multi-layered process, at the beginning of which is a certain impact on the level of the genetic material. This can be a direct impact (for example ionizing radiation) or an indirect action via the product of a reaction (for example OH radicals). **A direct or indirect interaction with DNA can lead to damage of the DNA or the chromatin structures (see also Chapter 3). If those damages are not repaired by endogenous processes, the damage will be permanent. Thus, the initiated cell can, if the immunological control fails, under the influence of hormones and promoters develop into a pre neoplastic focus, which can then lead to a malignant tumor.** The different steps of carcinogenesis are summarised in three phases:

■ Initiation: Triggering of damage on the DNA and mutations on critical genes
■ Promotion: Increased rate of DNA synthesis and proliferation of transformed cells
■ Progression: Transition of a pre neoplastic focus to a malignant tumor

A physical or chemical pollutant can in principle be effective in all three phases of carcinogenesis.

■ Initiation: Triggering of direct DNA damage or of a substance which causes DNA damage, disruption of repair processes of the DNA
■ Promotion: Promotion of the proliferation of transformed cells
■ Progression: Suppression of immune reactions and promotion of tumor growth

Results from Animal Experiments

In vivo experiments using animals with an inbred genetic predisposition for certain tumor illnesses or in which animals were injected with cancer cells, yielded very different results (see Appendix C, Table C.1). In the majority of the studies, no cancer promoting effect of high frequency electromagnetic fields could be found, or effects were only observed under certain conditions of exposure (marked in the Table with ‘partly’), and even in those cases they were often not statistically significant. However, it needs to be noted that many studies with negative results had very short exposure times and durations of the study itself (for example Chagnaud et al. 1999: 2 weeks, Salford et al. 1993: 2 to 3 weeks) and hence they do not have much relevance to answer the question whether high frequency electromagnetic fields have carcinogenic potential. **Some long term studies have yielded results which indicate a carcinogenic or cocarcinogenic effect of electromagnetic fields with mobile telecommunications frequencies if the animals are exposed over a long period of time.**

(*Repacholi et al. 1997, *Szmigielski et al. 1982 and *Szudinski et al. 1983). Important in this context is also the study of Chou et al. (*1992). This study did not find a statistically significant rise in tumors in a particular organ. However, **the exposed group developed not only a higher number of tumors in total, but also the number of primary malignant and metastatic malignant neoplasms was significantly higher in the exposed animals**. In their discussion of the results, the authors point to the fact that the number of the primary malignant neoplasms in the exposed group compared to the control group is four times higher and that this finding is statistically significant, but then go on to undermine their finding by quoting literature, according to which the tumor incidence of the exposed group should still be within the normal range.
The experiment of Toler et al. (*1997) using animals with a predisposition for chest tumors did not result in a higher incidence of these, **but the number of ovarian tumors was significantly higher in the exposed group compared to the controls. The intensities at which an increase in tumors was found in animals were one to two powers of ten below the values at which one would expect a triggering of 'thermal'** effects. According to the presenting results, low frequency modulation does not seem to be responsible for the carcinogenic effect.

6.1.2 Infertility and Teratogenic Effects

Teratogenesis
Teratogenic effects of a pollutant can – as with the carcinogenic effect – either be caused by the triggering of a genetic defect or a harmful impact on the foetal development. The formation of a genetic malformation during its initiation phase is analogous to carcinogenesis, i.e. teratogenic effects are also caused by direct or indirect impact on the DNA and disruptions of the endogenous repair mechanisms. Later damages of the foetus can either be caused by direct effects of the pollutant on the foetus or by reactions to the pollutant within the mother's organism, which would then be passed on to the foetus.

Results from Animal Experiments
A multitude of studies have demonstrated that high body temperatures in mammals lead to a spermatotoxic and teratogenic effect. Since many studies examining such effects from high frequency electromagnetic fields worked with intensities that were capable of significantly raising body temperature, it cannot be excluded that the observed spermatotoxic and teratogenic effects were caused by a thermal effect, (see for example Berman et al. 1982, 1983, Berman & Carter 1984, Jensh et al. 1983a,b, Kowalczuk et al. 1983, Lary et al. 1983, Nawrat et al. 1985, Saunders et al. 1981, 1983, for the results of older studies, see O'Connor 1980). The results of these studies do not always appear consistent, however, this can possibly be explained by a different thermal susceptibility of the different animal species used. In rats for example, a loss of thermally damaged embryos is often observed, whilst the birth of malformed animals is rare. Other mammals show a wider bandwidth between teratogenic and lethal exposures. (Verschaeve & Maes 1998).

However, there are some indications in the literature for teratogenic effects at intensities that cause no (or, if at all very small) rises in temperature. Magras & Xenos (1997) exposed mice during six months to a real transmitter. The mice had offspring five times during this period and a continuous decrease in offspring was found down to irreversible infertility. The exposure consisted of several radio and TV transmitters in the VHF and UHF bands and measured between 0.00168 and 0.01053 W/m2. A repetition of this study would be desirable in order to exclude that the effect was due to problems with the maintenance of the animals or the screening of the control group. **Khillare and Behari (*1998) found that male rats that had been exposed to a 200 MHz field (power flux density:14.7W/m2, SAR:1.65 to 2.0W/kg) during a period of 35 days for six days per week and two hours per exposure day and which were afterwards mated with unexposed females, produced significantly less offspring that the males in the unexposed control group.**
In an experiment by Akdag et al. (1999) male rats were exposed one hour every day to a 9.45 GHz field (power flux density:2.5W/m2, SAR:1.8 W/kg) during different periods of 13, 26, 39 or 52 days corresponding to one, two, three and four cycles of the seminal epithelium. At the end of each exposure period the following data were measured and compared to an unexposed control group: number of sperm in the epididymides, morphology of the sperm and weight of the testicles, epididymides, seminal vesicles and prostate. **They found amongst other effects a decrease in the number of sperm (statistically significant in the group exposed for 53 days) and an increase of abnormal sperm (statistically significant in the groups exposed for 26, 39 and 52 days). A co teratogenic effect under non-thermal exposures with power flux densities of 10 to 100 W/m2 in combination with cytosine arabinoside (CA) was found in a study by Marcickiewicz et al. (*1986).** In the experiment, mice were exposed in utero for two hours a day to 2.45 GHz from the first to the 18th day of the pregnancy. **The field, which alone was not teratogenic, significantly increased the teratogenic effect of CA. A direct teratogenic effect of microwave radiation with a frequency of 2.45 GHz on the brains of newborn rats was found by Inalösz et al. (*1997).** However the authors declared that the SAR of 2.3W/kg led to a rise of rectal temperature of 1.0ºC.

6.2 Results of Epidemiological Studies

Methodological Requirements
In principle, epidemiological studies are an effective instrument to prove potential health risks of a pollutant under real environmental and exposure conditions. Usually, they are carried out by comparing statistical data about the incidence of an illness in an exposed population as opposed to the incidence of this illness in an unexposed population. The exact classification of exposure would require the metrological recording of the pollutant for all participants (exposed and unexposed) during the entire latency period of the illness. This is often not practicable and for long latency periods, which can usually only be addressed via retrospective studies, inherently impossible. Under such circumstances it has to suffice that

surrogates are used, for example having a profession which is linked to a certain exposure or the proximity of the home to an emitting installation. In some cases, if the emitting installations have been used for a long time in the same mode, it is possible to extrapolate past exposures from current measurements. The quality of the exposure classification determines the validity of an epidemiological study. Possible weaknesses, which can lead to wrong results, are:

■ People are classified as 'exposed' or 'strongly exposed' although in fact there is no or only little exposure. An example with regards to high frequency fields is the often used exposure classification on the basis of professional categories, such as radar operators or telecommunications engineers, for whom it cannot be excluded that the main occupation is a desk job without exposure.

■ It is assumed that the control group is completely unexposed, although the pollutant is actually ubiquitous, which will lead to smaller but still potentially significant exposures in the control group. One known example are mains frequency magnetic fields, which affect the immediate neighbours of power supply equipment, but still exist at non negligible strengths in houses which are further away from such equipment.

Both effects lead to a levelling out between the exposed and unexposed group and hence to an underestimation of the real health risk posed by the pollutant in question.

Another weakness of epidemiological studies can be the presence of unrecognized confounders, i.e. other influences, which also affect the groups studied and influence the development of the illness. This can be environmental factors, such as exposures to other pollutants, but also socio economic and behavioural factors. If not all potentially relevant confounders are factored in, the results can be distorted, either towards an overestimation or an underestimation of the real risk.

The fast development of mobile technology has lead to a double dilemma with regards to the study of potential risks through epidemiological studies:

■ **For illnesses like cancer with latency periods of many years it is still too early to expect valid results. If mobile telecommunications are indeed linked to a higher incidence of cancer, the illness will only have manifested in a few people so far.** This should at least be valid for the part of the population whose exposures are from base stations only. Potentially it could be different for direct mobile phone users, since these are generally exposed to significantly higher intensities. But also for this group, at this moment in time, **we would expect results from epidemiological studies to underestimate the real risk.**

■ **In some years epidemiological studies will hit a different obstacle: once base stations cover the entire country and a large proportion of the population use a mobile phone, it will become difficult to find the necessary unexposed control groups.** Given this dilemma, epidemiological studies carried out in the past have a certain validity, even if the exposures are not exactly the same as they would be today and the studies do not always correspond to today's quality standards.

The Selection of Studies

At the time of finishing this present report there were only two epidemiological studies of health risks in relation to actual existing mobile telecommunications exposures (*Rothman at

al. 1996, *Hardell et al. 1999). However there are a much larger number of studies available, in which the health effects of high frequency electromagnetic fields in humans were examined (see also Appendix D, Table D.1). Just under a quarter of all results relate to exposures with low frequency pulse or amplitude modulated high frequency fields, such as they are used for mobile telecommunications, even if the carrier and modulation frequencies are in most cases not identical with those of mobile telecommunications. In Appendix Table D.1, the examined illnesses are listed with their evaluated end point (incidence or mortality), data describing the exposure situation is given and the quality of the exposure classification is assessed. Finally, the result of the study is evaluated as 'Relative Risk' (RR) which includes the relevant risk factors in the form of standardized mortality rates, standardised morbidity rates and odds ratios, and the statistical significance is assessed. For each study we list the value for the highest exposure class or if there was a further differentiation of the examined groups, for example according to occupational groups, the highest found value. Values are considered statistically significant (s.s.) if the value RR=1 outside of the 95% confidence interval or if $p<0.05$. A statistical evaluation of the results presented in Table D.1 can be found in Table 6.1. Here, we list for every illness how many studies or separate results are available, how many of these show a relative risk RR >1 and how many are statistically significant. Almost all the studies, in which the total cancer risk without any differentiation according to tumor form were examined, showed a risk factor of RR>1. **Half of the studies resulted in statistically significant risk factors with a maximum value of 2.1, which corresponds to a doubling of the statistical risk to develop cancer from exposure to high frequency electromagnetic fields. A similar picture was found in relation to tumors of the nervous system, especially brain tumors. Here, the maximum value for relative risk found was 3.4. Eleven of the total of 15 studies yielded a positive result, more than half of which were statistically significant.** The incidence of breast cancer in relation to high frequency fields must be examined separately for men and women. **All three studies relating to the breast cancer incidence in women yielded risk factors greater than 1, the statistically significant values were 1.15 and 1.5. For men, risk factors of up to 2.9 were found**; however, not all were statistically significant.

Of the total of 16 results for leukaemia without further differentiation of the illness, 13 were positive (RR>1), more than half of these results were statistically significant. The highest statistically significant value for the relative risk was 2.85. Amongst the results of the differentiated studies, the following are notable: lymphatic leukaemia (7 results, 5 positive, 4 statistically significant, RR maximum value: 2.74) and acute myeloic leukaemia (4 different studies, 3 positive results, 2 statistically significant, maximum RR value: 2.89).

With regards to the correlation of high frequency electromagnetic fields from radar and other sources and testicular cancer, three studies have been conducted. All lead to statistically significant risk factors with a maximum value of 6.9. The studies regarding cardio-vascular diseases did not result in a clear picture, not least because of the multitude of the symptoms examined.

All four studies of fertility problems in relation to the exposure of men to microwaves

indicate increased risk. In two studies statistically significant risk factors of up to 2.7 were found.

With regards to irregular courses of pregnancies and malformations in children of mothers which had been exposed to high frequency fields, there are a large number of studies with positive results, of which only two fit into the frequency range relevant to our report. Both of these studies found statistically significant positive results with risk factors of up to 2.36.

Of the studies of cancer risk of children whose fathers had been exposed to electromagnetic fields, only two correspond to the quality criteria required for inclusion into this report. Both indicate an increased risk, but only one result is statistically significant at a value of RR=2.3. (With regards to the cancer risk of children in correlation to the exposure of their parents, see also Colt & Blair 1998).

Regarding the disruption of motor functions as well as psychological functions and well being, there is only one valid study for the frequency bands relevant to this report, which yielded a slightly increased risk factor. However since other studies of transmitters with frequencies below 100 MHz resulted in serious indications of increased risk, indicating that this problem should be given more attention in the future, we also included the study of Zhao et al. (1994), although it didn't meet our quality standards with regards to the statistical evaluation.

Unfortunately, the majority of the studies do not state the actual strength of the exposures. Measurements are only available for the radio and television transmitter used for the studies of Hocking et al. (1996) and McKenzie et al. (1998). The mean power flux densities for all 16 municipalities affected by this transmitter were 3.3 10 3W/m2 within the range from 2.6 10 4 to 1.46 10 2W/m2 (McKenzie et al. 1998). The ICNIRP guidelines for the general population recommend a maximum value of 2 to 2.51 W/m2 for the range of frequencies emitted by this transmitter (64.25 to 527.25MHz). **This means that the exposures in these studies were below the German guidelines by a factor of 10 4.**

Table 6.1
Overview over the results of epidemiological studies with regards to the health risks of high frequency electromagnetic exposures (see also Appendix D, Table D.1)

Illness Number of studies (results) Studies (results) with RR>1 Statistically significant results
All illnesses 2 0 0
Cancer, unspecified 6 (7) 5 (6) 3
Brain tumours unspecified and tumours of the
nervous system unspecified
14 (21) 10 (15) 6 (7)
Cancer (eyes) 1 1 1

Cancer of the respiratory organs, lung cancer 5 2 1
Chest cancer, men 2 2 0
Breast Cancer, women 3 3 2
Cancer of the lymphatic and blood forming system unspecified
4 4 1
Leukaemia unspecified 12 (16) 9 (13) 5 (7)
Acute leukaemia unspecified 4 4 0
Lymphatic leukaemia unspecified 4 (7) 2 (5) 1 (4)
Acute lymphatic leukaemia 2 2 0
Chronic lymphatic leukaemia 4 4 1
Leukaemia, non lymph. non-myelo 1 (4) 1 (4) 1 (2)
Lymphoma, Hodgkin-Syndrome 5 (7) 3 (4) 1
Testicular cancer 3 (5) 3 (5) 3 (4)
Uterine cancer 1 1 1
Skin cancer 4 3 1
Cardio-vascular diseases 4 (5) 3 (4) 1
Infertility, reduced fertility, men 4 (7) 4 (7) 2 (4)
Infertility, reduced fertility, women 1 1 0
Miscarriages, stillbirths, malformations and other birth defects
2 (3) 2 (3) 2
Cancer, offspring (parental exposure) 2 2 1
Neurodegenerative diseases, Alzheimer's 1 1 0
Disruptions of motor and psychological functions and well-being
2 (9) 2 (9) 1 (7)

7 Health Risks to Humans Resulting from Exposure to the Electromagnetic Fields of Mobile Telecommunications

The triggering of an illness caused by an (environmental) pollutant and the development of this illness are a multi-phased process, which begins with a biological, biochemical or biophysical primary interaction of the pollutant with the biological system and ends with the manifestation of the illness. During the different phases of the process, the body's own repair mechanisms can intervene and impede the further development of the illness. An assessment of the potential health risks of electromagnetic fields as they are used for mobile telecommunications should therefore be mainly based on studies conducted directly on humans, because extrapolations from animal studies or even in vitro studies on cell cultures only have limited validity for effects in humans, due to the difference in susceptibilities and the lack of organic interactions in cell cultures. However, due to the ethical limits to the research on humans, it is unavoidable to use results from experiments with animals, single

organs or cells in order to discover the biological and physiological mechanisms.

Cancer

Given the results of the present epidemiological studies, it can be concluded that electromagnetic fields with frequencies in the mobile telecommunications range do play a role in the development of cancer. This is particularly notable for tumours of the central nervous system, for which there is only the one epidemiological study so far, examining the actual use of mobile phones. The most striking result of this study was an obvious correlation between the side at which the phone was used and the side at which the tumour occurred. The brain tumour incidence however was only slightly increased. A (hypothetical) explanation of such a finding could for example be that mobile fields have a promoting effect on previously initiated (multiple) tumours, triggering a defence mechanism in the body which is capable of suppressing unpromoted tumours. **Higher risks were also demonstrated for several forms of leukaemia.**

Although the studies in relation to testicular cancer were examining particular exposure conditions (emitting equipment worn partly on the body at hip level), given the high risk factor found, a possible risk cannot be excluded, especially not for mobile users wearing the devices in standby mode on their belts. The epidemiological findings for testicular cancer also need to be interpreted in conjunction with the results of the studies of fertility
problems occurring in relation to high frequency electromagnetic fields.

The risk factors for cancers other than testicular cancer are only moderately increased, but not negligible, considering this technology will potentially reach full coverage of the entire population.

Reliable conclusions about a possible dose-response-relationship cannot be made on the basis of the present results of epidemiological studies, but an increase of cancer risk cannot be excluded even at power flux densities as low as 0.1 W/m2.

In long-term animal experiments, the carcinogenic effect of pulse modulated high frequency fields was demonstrated for power flux densities of circa 3W/m2 (mouse, exposure duration 18 months, 30 minutes per day, SAR (mouse) circa 0.01 W/kg).

On the cellular level, a multitude of studies found the type of damage from high frequency electromagnetic fields which is important for cancer initiation and cancer promotion:

Direct damage on DNA as well as influences on DNA synthesis and DNA repair mechanisms were demonstrated in in vivo and in vitro experiments for continuous and pulsed fields at power flux densities from 10W/m2 and 9W/m2 respectively.

Chromosome aberrations and micronuclei occurred at power flux densities from 5 W/m2. Neoplastic cell transformation and an enhanced cell proliferation were demonstrated for Specific Absorption Rates of below 0.5W/kg, and individual studies demonstrated that the obvious disturbance of the communication between cells, which is a prerequisite for the uninhibited proliferation of cells that is characteristic for cancer development, occurs at just a few W/m2.

Conclusion:

The results of the studies for all stages of cancer development from the damage of the genetic material via the uninhibited proliferation of cells and debilitation of the immune system (see below) up to the manifestation of the illness prove effects at power flux densities of less than 1 W/m2. For some stages of cancer development, intensities of 0.1 W/m2 or even less may suffice to trigger effects.

Debilitation of the Immune System

Damaging effects on the immune system which can aid the development of illnesses were demonstrated in animal experiments at power flux densities of 1 W/m2 (mouse, exposure duration 6 days, 3 hours per day, SAR (mouse) 0.14W/kg). In in vitro experiments on lymphocytes, defects of the genetic material were demonstrated at power flux densities of circa 10 W/m2. The presence of stress hormones, which when permanent can debilitate the
immune system, was found to be increased in human experiments from power flux densities of 0.2W/m2. In animal experiments (rat) a similar effect was observed at a Specific Absorption Rate of circa 0.2 W/kg.

Conclusion:

Experiments on animals prove harmful effects on the immune system from circa 1 W/ m2;at power flux densities of 0.2 W/m2 higher secretions of stress hormones in humans have been demonstrated.

Influences on the Central Nervous System and Cognitive Function

The effects of pulsed and continuous high frequency fields on the blood brain barrier and the activity of neurotransmitters were demonstrated in animal experiments for power flux densities of 3 and 10 W/m2 respectively.
In humans, influences on the slow brain potentials were found at SAR values of 0.882 to 1.42W/kg, i.e. well below the current guidelines for partial body exposure of 2 W/kg. Changes in the sleep EEG of humans, which showed a shortening of the REM sleep phase occurred at intensities as low as 0.5 W/m2.
In animal experiments, changes in the EEG were demonstrated at power flux densities of 1 to 2W/m2. Impairment of cognitive functions was found in animal experiments at power flux densities of 2W/m2. In humans, there are indications that brain functions are influenced by fields such as they occur when using a mobile telephone.

An epidemiological study of children who had been exposed to pulsed high frequency fields, found a decrease in the capability to concentrate and an increase in reaction times.

Conclusion:

Effects of high frequency electromagnetic fields on the central nervous system are proven for intensities well below the current guidelines. Measurable physiological changes have been demonstrated for intensities from 0.5 W/m2. Impairments of cognitive functions are proven for animals from 2W/m2.

Electrosensitivity or Electromagnetic Hypersensitivity

The terms 'electrosensitivity' or 'electromagnetic hypersensitivity' describe disturbances of well being and impairments of health, such as they are suffered by certain sensitive people when working with or being in the presence of devices and equipment emitting electrical, magnetic or electromagnetic fields. The sensitivity manifests in a variety of symptoms including:

- **nervous symptoms such as sleep disturbances, headaches, exhaustion, lack of concentration, irritability, anxiety, stress**
- **cardio-vascular complaints**
- **disruptions of hormones and metabolism**
- **skin complaints**

The composition and strength of the complaints varies enormously in different individuals. The correlation of the complaints with electromagnetic exposures and other environmental influences seems to vary strongly not only between affected persons but also in time, a fact that has so far impeded the conclusive scientific proof of a cause effect relationship in provocation studies. The present results of scientific studies are often not conclusive and partly contradictory. On the other hand, however, there is a wealth of data collected by the self help organisations of affected people, which has not yet been explored.

Conclusion

On the basis of current knowledge it is impossible to estimate the risk of electrosensitive reactions or to make recommendations for guidelines designed to avoid such a risk for the general population, which is composed of sensitive and non sensitive persons.

8 Recommendations

8.1 Precautionary Health Protection in Relation to Exposures to Electromagnetic Fields of Mobile Telecommunications

With mobile telecommunications we have to differentiate to exposure situations:

- **exposure of residents near base stations**
- **exposure of mobile users when using the devices**

To limit exposure to an acceptable degree, if this is possible at all, there need to be different strategies for the two different exposure groups.

Exposures from Base Stations

In humans, harmful organic effects of high frequency electromagnetic fields as used by

mobile telecommunications have been demonstrated for power flux densities from 0.2W/m2 (see Chapter 7). **Already at values of 0.1 W/m2 such effects cannot be excluded. If a security factor of 10 is applied to this value, as it is applied by ICNIRP and appears appropriate given the current knowledge, the precautionary limit should be 0.01W/m2. This should be rigorously adhered to by all base stations near sensitive places such as residential areas, schools, nurseries, playgrounds, hospitals and all other places at which humans are present for longer than 4 hours.**
We recommend the precautionary limit of 0.01 W/m2 independent of the carrier frequency. The rough dependency on frequency with higher limits outside of the resonance range, as it is applied in the concept of SAR, is not justifiable given the results of the scientific studies which conclusively prove non thermal effects of high frequency fields. Also, the current allowed higher exposures for parts of the body, as long as they refer to the head or thorax are not justifiable.

Exposures of Mobile Phone Users
Given the state of technology now and in the foreseeable future, it is currently technically impossible to apply the recommended maximum value for mobile base stations also to the use of mobile phones. **However, a lowering of the guidelines to a maximum of 0.5 W/m2 should urgently be considered.**
A particular problem in this exposure group is posed by children and adolescents, not only because their organism is still developing and therefore particularly susceptible, but also because many adolescents have come to be the most regular users of mobile phones.
Advertising towards this population group should be banned. Furthermore, particular efforts should be made to lower the exposures during calls. It would be recommendable to conduct (covert) advertising campaigns propagating the use of headsets. It would also be important to develop communications and advertising aiming at minimising the exposures created by carrying mobile phones in standby mode on the body.

8.2 Scientific Studies Regarding the Health Risk of Mobile Telecommunications

The precautionary limits recommended in Chapter 8.1 are based on the current scientific knowledge. This is, however, still incomplete and in the case of this technology, which is exposing the entire population to its emissions, further research efforts are needed to create a base for the setting of truly reliable guidelines. Based on the scientific knowledge presented in this report, the further research requirements are mainly for studies on living organisms (humans or animals):

Epidemiological studies
■ studies that metrologically record the exposure on existing radio transmitters (USW), TV transmitters and longer established radio communications and paging networks. (The emissions of this type of equipment with regards to the modulation frequencies may not

be directly comparable to those of mobile telecommunications, but such studies could nevertheless offer important indications for the assessment of the exposure risks of high frequency electromagnetic fields; the studies should focus on cancer and illnesses of the central nervous system including neurodegenerative diseases as well as cardio-vascular diseases and any diseases caused by a disruption of the immune system; such studies should also address potential clusters of unspecified symptoms and impairments of well-being (electrosensitivity)).

■ a meta study with retrospective dosimetry for the studies which examined the residents near emitting base stations (see Appendix D) with the help of measured data from comparable sites

■ a cohort study examining the health (see above) of mobile users and residents near mobile base stations

■ epidemiological animal studies on pets

Experimental long term studies

Studies of the chronic effects of the fields emitted by mobile telecommunications

■ on the central nervous system (preferably on humans)

■ on the immune and endocrine system (preferably on humans, but further animal experiments at low intensities would also be helpful for example with regards to EMFinduced stress)

■ on the cardio vascular system (variability of heartbeat rates, blood pressure, etc., on humans and on animals)

Experimental short term studies

Studies of the acute effects of the fields emitted by mobile telecommunications

■ on the brain in various rest and stress situations (preferably making use of EEG and similar methods)

Beyond these suggestions, it would be important to develop a strategy for the research of the 'electrosensitivity' phenomenon and its incidence, which would acknowledge the failure of traditional scientific methods to address the problem and allow the inclusion of the data available from the self help groups and associations of the affected.

The following are some of the studies the Ecolog report used in determining their findings and recommendations.

Adey W.R., Byus C.V., Cain C.D., Higgins R.J., Jones R.A., Kean C.J., Kuster N., MacMurray A., Stagg R.B., Zimmermann G., Phillips J.L. & Haggren W.	1999	Spontaneous and nitrosourea-induced primary tumors in the central nervous system in Fischer 344 rats chronically exposed to 836 MHz modulated microwaves	Radiat. Res.	152	293-302
Akdag M.Z., Celik S., Ketani A., Nergiz Y., Deniz M. & Dasdag S.	1999	Effect of chronic low-intensity microwave radiation on sperm count, sperm morphology, and testicular and epididymal tissues of rats	Electro- Magnetobiol.	18, 2	133-145
Albert E.N.	1979	Reversibility of microwave-induced blood-brain-barrier permeability	Radio Sci.	14, 6S	323-327
Alberti E.N. & Kerns J.M.	1981	Reversible microwave effects on the blood-brain barrier	Brain Res.	230	153-164
Anderstam B., Hamnerius Y., Hussain S. & Ehrenberg L.	1983	Studies of possible genetic effects in bacteria of high frequency electromagnetic fields	Hereditas	98	11-32
Antonopoulos A., Eisenbrandt H. & Obe G.	1997	Effects of high-frequency electromagnetic fields on human lymphocytes *in vitro*	Mutat. Res.		209-214
Balcer-Kubiczek E.K. & Harrison G.H.	1985	Evidence for microwave carcinogenicity *in vitro*	Carcinogenesis	6 (6)	859-864
Balcer-Kubiczek E.K. & Harrison G.H.	1989	Induction of neoplastic transformation in C3H/10T1/2 cells by 2.45 GHz microwaves and phorbol ester	Radiat. Res.	117	531-537
Balcer-Kubiczek E.K. & Harrison G.H.	1991	Neoplastic transformation of C3H/10T1/2 cells following exposure to 120-Hz modulated 2.45-GHz microwaves and phorbol ester tumor promoter	Radiat. Res.	126	65-72
Balode Z.	1996	Assessment of radio-frequency electromagnetic radiation by the micronucleus test in bovine peripheral erythrocytes	Sci Total Environ	180	81-85
Banerjee R., Goldfeder A. & Mitra J.	1983	Sister chromatid exchanges and chromosome aberrations induced by radio sensitizing agents in bone marrow cells of treated tumor-bearing mice	JNCI	70, 3	517-521
Bawin S.M., Kaczmarek L.K. & Adey W.R.	1975	Effects of modulated VHF fields on the central nervous system	Ann. N. Y. Academ. Sciences	247	74-80
Beall C., Delzell E., Cole P. & Brill I.	1996	Brain tumors among electronics industry workers	Epidemiology	7, 2	125-130
Beechey C.V., Brooker D., Kowalczuk D., Saunders C.I. & Searle A.G.	1986	Cytogenic effects of microwave irradiation on male germ cells of the mouse	Int. J. Radiat. Biol.	50, 5	909-918
Behari J., Kunjilwar K.K. & Pyne S.	1998	Interaction of low level modulated RF radiation with Na+-K+-ATPase	Bioelectrochemistry	47	247-252
Berman E., Carter H.B. & House D.	1980	Tests for mutagenesis and reproduction in male rats exposed to 2.45 GHz (CW) microwaves	Bioelectromagnetics	1	65-76
Berman E., Carter H.B. & House D.	1982	Reduced weight in mice offspring after in utero exposure to 2450-MHz (CW) microwaves	Bioelectromagnetics	3	285-291
Berman E..& Carter H.B.	1984	Decreased body weight in foetal rats after irradiation with 2450-MHz (CW) microwaves	Health Phys.	46, 3	537-542
Bernhardt J.H., Matthes R. & Repacholi M.H. (Ed.)	1997	Non thermal effects of RF electromagnetic fields. Proceedings international seminar on biological effects of non-thermal pulsed and amplitude modulated RF electromagnetic fields and related health risks. Munich	ICNIRP	3/97	
Blackman C.F., Elder J.A., Weil C.M., Benane S.G., Eichinger D.C. & House D.E.	1979	Induction of calcium-ion efflux from brain tissue by radio-frequency radiation: effects of modulation frequency and field strength	Radio Sci	14, 6S	93-98
Bohr H. & Bohr J.	2000	Microwave enhanced kinetics observed in ORD studies of a protein	Bioelectromagnetics	21	68-72
Bohr H., Brunak S. & Bohr J.	1997	Molecular wring resonances in chain molecules	Bioelectromagnetics	18	187-189
Borbély A.A., Huber R., Graf T., Fuchs B., Gallmann E. & Achermann P.	1999	Pulsed high-frequency electromagnetic fields affects human sleep and sleep electroencephalogram	Neuroscience Lett.	275	207-210
Bortkiewicz A., Gadzicka E. & Zmyslony M.	1996	Heart rate variability in workers exposed to medium-frequency electromagnetic fields	J. Auton Nerv Syst	59	91-97
Brusick D., Albertini R., McRee D., Peterson D., Williams G., Hanawalt P. und Preston J.	1998	Genotoxicity of Radiofrequency Radiation	Environ. Mol. Mutagenesis	32	1-16
Byus C.V., Kartun K., Pieper S. & Adey W.R.	1988	Increased ornithine decarboxylase activity in cultured cells exposed to low energy modulated microwave fields and phorbol ester tumor promoters	Cancer Res	48	422-426
Byus C.V., Lundak R.L., Fletcher R.M. & Adey W.R.	1984	Alterations in protein kinase activity following exposure of cultured human lymphocytes to modulated microwave fields	Bioelectromagnetics	5	341-351

Cain C.D., Thomas D.L. & Adey W.R.	1997	Focus formation of C3H/10T1/2 cells and exposure to a 836.55 MHz modulated radiofrequency field	Bioelectromagnetics	18	237-243
Cantor K.P., Stewart P.A., Brinton L.A. & Dosemeci M.	1995	Occupational exposures and female breast cancer mortality in the United States	J. Occup. Environ. Med.	37 (3)	336-348
Chagnaud J.-L. & Veyret B.	1999	*In vivo* exposure of rats to GSM-modulated microwaves: flow cytometry analysis of lymphocyte subpopulations and of mitogen stimulation	Int. J. Radiat. Biol.	75, 1	111-113
Chagnaud J.-L., Moreau J.-M. & Veyret B.	1999	No effect of short-term exposure to GSM-modulated low-power microwaves on benzo(a)pyrene-induced tumours in rat	Int. J. Radiat. Biol.	75, 10	1251-1256
Chizhenkova R.A.	1988	Slow potentials and spike unit activity of the cerebral cortex of rabbits exposed to microwaves	Bioelectromagnetics	9	337-345
Chizhenkova R.A. & Safroshkina A.A.	1996	Electrical reactions of brain to microwave irradiation	Electro-Magnetobiology	15, 3	253-258
Chou C.-K., Guy A.W., Kunz L.L., Johnson R.B., Crowley J.J. & Krupp J.H.	1992	Long-term, low-level microwave irradiation of rats	Bioelectromagnetics	13	469-496
Ciaravino V., Meltz M.L., & Erwin D.N.	1991	Absence of synergistic effects between moderate-power radio-frequency electromagnetic radiation and adriamycin on cell-cycle progression and sister chromatid exchange	Bioelectromagnetics	12	289-298
Ciaravino V., Meltz M.L. & Erwin D.N.	1987	Effects of radiofrequency radiation and simultaneous exposure with mitomycin C on the frequency of sister chromatid exchanges in Chinese hamster ovary cells	Environ. Mutagen.	9	393-399
Cleary S.F., Cao G. & Liu L.-M.	1996a	Effects of isothermal 2.45 GHz microwave radiation on the mammalian cell cycle: comparison with effects of isothermal 27 MHz radiofrequency radiation exposure	Bioelectrochem Bioenerg	39	167-173
Cleary S.F., Cao G., Liu L.M., Egel P.M. & Shelton K.R.	1997	Stress proteins are not induced in mammalian cells exposed to radiofrequency or microwave radiation	Bioelectromagnetics	18	499-505
Cleary S.F., Du Z., Cao G., Liu L. & McCrady C.	1996b	Effect of isothermal radiofrequency radiation on cytolytic T lymphocytes	FASEB J	10	913-919
Cleary S.F., Liu L.-M- & Merchant R.E.	1990a	*In vitro* lymphocyte proliferation induced by radio-frequency electromagnetic radiation under isothermal conditions	Bioelectromagnetics	11	47-56
Cleary S.F., Liu L.-M. & Merchant R.E.	1990b	Glioma proliferation modulated *in vitro* by isothermal radiofrequency exposure	Radiat. Res.	121	38-45
Cole Johnson C. & Spitz M.R.	1989	Childhood nervous system tumours: an assessment of risk associated with paternal occupations involving use, repair or manufacture of electrical and electronic equipment	Int. J. Epidemiol.	18, 4	756-762
Colt J.S. & Blair A.	1998	Parental occupational exposure and risk of childhood cancer	Environ. Health Perspect.	106 (Suppl. 3)	909-925
Czerska E.M., Elson E.C., Davis C.C., Swicord M.L. & Czerki P.	1992	Effects of continuous and pulsed 2450-MHz radiation on spontaneous lymphoblastoid transformation of human lymphocytes *in vitro*	Bioelectromagnetics	13	247-259
d'Ambrosio G., Lioi M.B., Massa R., Scarfi M.R. & Zeni O.	1995	Genotoxic effects of amplitude-modulated microwaves on human lymphocytes exposed *in vitro* under controlled conditions	Electro-Magnetobiology	14	157-164
D'Andrea J.A.	1991	Microwave radiation absorption: behavioral effects	Health Physics	61, 1	29-40
D'Andrea J.A.	1999	Behavioral evaluation of microwave irradiation	Bioelectromagnetics	20	64-74
D'Inzeo G., Bernardi P., Eusebi F., Grassi F., Tamburello C. & Zani B.M.	1988	Microwave effects on acetylcholine-induced channels in cultured chick myotubes	Bioelectromagnetics	9	363-372
Dardalhon M., Averbeck D. & Berteaud A.J.	1981	Studies on possible genetic effects of microwaves in prokaryotic and eukaryotic cells	Radiat Environ Biophys	20	37-51
Dardalhon M., Averbeck D., Berteaud A.J. & Ravary V.	1985	Thermal aspects of biological effects of microwaves in Saccharomyces cerevisiae	Int J Radiat Biol	48	987-996
Dasdag S., Oflazoglu H., Kelle M. & Akdag Z.	1998	Effects of microwaves on the phagocytic activity of variously treated rat macrophages	Electro- Magnetobiol.	17, 2	185-194
Davis R.L. & Mostofi F.K.	1993	Cluster of testicular cancer in police officers exposed to hand-held radar	Am. J. Indust. Med.	24	231-233
Demers P.A., Thomas D.B., Rosenblatt K.A., Jimenez L.M., McTiernan A., Stalsberg H., Sternhagen A., Douglas W.D., McCrea Curnen M.G., Satariano W., Austin D.F., Isacson P., Greenberg R.S., et al.	1991	Occupational exposure to electromagnetic fields and breast cancer in men	Am. J. Epidemiol.	134 (4)	340-347
Dobson J. & Pierre T.G.S.	1998	Thermal effects of microwave radiation on biogenic magnetite particles and circuits: theoretical evaluation of cellular phone safety aspects	Electro- Magnetobiol.	17, 3	351-359
Dolk H., Elliott P., Shaddick G., Walls P. & Thakrar B.	1997b	Cancer incidence near radio and television transmitters in Great Britain, II All high power transmitters	Am. J. Epidemiol.	145, 1	10-17

Dorp R. van, Marani E. & Boon M. E.	1998	Cell replication rates and processes concerning antibody production *in vitro* are not influenced by 2.45-GHz microwaves at physiologically normal temperatures.	Methods	15	151-159
Dutta S.K., Ghosh B. & Blackman C.F.	1989	Radiofrequency radiation-induced calcium ion efflux enhancement from human and other neuroblastoma cells in culture	Bioelectromagnetics	10	197-202
Dutta S.K., Subramoniam A., Ghosh B. & Parshad R.	1984	Microwave radiation-induced calcium ion efflux from human neuroblastoma cells in culture	Bioelectromagnetics	5	71-78
Dutta S.K., Verma M. & Blackman C.F.	1994	Frequency-dependent alterations in enolase activity in Escheria coli caused by exposure to electric and magnetic fields	Bioelectromagnetics	15	377-383
Elekes E., Thuróczy G. & Szabó L.D.	1996	Effect on the immune system of mice exposed chronically to 50 Hz amplitude-modulated 2.45 GHz microwaves	Bioelectromagnetics	17	246-248
Finkelstein M.M.	1998	Cancer incidence among Ontario police officers	Am. J. Ind. Med.	34	157-162
Foster K.R.	1996	Interaction of radiofrequency fields with biological systems as related to modulation	Bernhardt et al. (Ed.) 1997		47-63
Frei M.R., Berger R.E., Dusch S.J., Guel V., Jauchem J.R., Merritt J.H. & Stedham M.A.	1998a	Chronic exposure of cancer-prone mice to low-level 2450 MHz radiofrequency radiation	Bioelectromagnetics	19	20-31
Frei M.R., Jauchem J.R., Dusch S.J., Merritt J.H., Berger R.E. & Stedham M.A.	1998b	Chronic, low-level (1.0 W/kg) exposure of mice prone to mammary cancer to 2450 MHz microwaves	Radiat. Res.	150	568-576
Freude G., Ullsperger P., Eggert S. & Ruppe I.	1998	Effects of microwaves emitted by cellular phones on human slow brain potentials	Bioelectromagnetics	19	384-387
Freude G., Ullsperger P., Eggert S., Ruppe I. & Eulitz C.	1999	Untersuchungen zum Einfluß elektromagnetischer Felder von Mobiltelefonen auf langsame Hirnpotentiale im Elektroenzephalogramm des Menschen	in Krause et al. 1999		165-176
Fritze K., Sommer C; Schmitz B; Mies G; Hossmann KA; Kiessling M & Wiessner C.	1997b	Effect of global system for mobile communication (GSM) microwave exposure on blood-brain barrier permeability in rat	Acta Neuropathol.	94	465-470
Fritze K., Wiessner C., Kuster N., Sommer C., Gass P., Hermann D.M., Kiessling M. & Hossmann K.A.	1997 a	Effect of global system for mobile communication microwave exposure on the genomic response of the rat brain	Neuroscience	81	627-639
Fucic A., Garaj-Vrhovac V., Skara M. & Dimitrovic B.	1992	X-rays, microwaves and vinyl chloride monomer: their clastogenic and aneugenic activity, using the micronucleus assay on human lymphocytes	Mutat. Res.	282	265-271
Garaj-Vrhovac V., Fucic A. & Horvat D.	1992	The correlation between the frequency of micronuclei and specific chromosome aberrations in human lymphocytes exposed to microwave radiation *in vitro*	Mutation Res.	281	181-186
Garaj-Vrhovac V., Horvat D. & Koren Z.	1990	The effect of microwave radiation on the cell genome	Mutation Res.	243	87-93
Garaj-Vrhovac V., Horvat D. & Koren Z.	1991	The relationship between colony-forming ability, chromosome aberrations and incidence of micronuclei in V79 Chinese hamster cells exposed to microwave radiation	Mutation Res.	263	143-149
Garland F.C., Shaw E., Gorham E.D., Garland C.F., White M.R. & Sinsheimer P.J.	1990	Incidence of leukemia in occupations with potential electromagnetic field exposure in United States navy personnel	Am. J. Epidemiol.	132, 2	293-303
Garson O.M., McRobert T.L., Campbell L.J., Hocking B. & Gordon I.	1991	A chromosomal study of workers with long-term exposure to radio-frequency radiation	Med. J. Austral.	155	289-292
Glaser R.	1998	Do electromagnetic fields really increase the ornithine-decarboxylase (ODC) activity of cells? What happens with the 'coherence time' effect? - A comment to the papers of T.A. Litovitz et al.	Bioelectrochem. Bioenerget.	46	301-302
Goldman H., Lin J.C., Murphy S. & Lin M.F.	1984	Cerebrovascular permeability to 86Rb in the rat after exposure to pulsed microwaves	Bioelectromagnetics	5	323-330
Goswami P.C., Albee L.D., Parsian A.J., Baty J.D., Moros E.G., Pickard W.F., Roti Roti J.L. & Hunt C.R.	1999	Proto-oncogene mRNA levels and activities of multiple transcription factors in C3H 10T1/2 murine embryonic fibroblasts exposed to 836.62 and 847.74 MHz cellular phone communication frequency radiation	Rad. Res.	151	300-309
Grayson J.K.	1996	Radiation exposure, socioeconomic status, and brain tumor risk in the US Air Force: A nested case-control study	Am. J. Epidemiol.	143, 5	480-486
Grospietsch T., Schulz O., Hölzel R., Lamprecht I. & Kramer K.-D.	1995	Stimulating effects of modulated 150 MHz electromagnetic fields on the growth of Escherichia coli in a cavity resonator	Bioelectrochem. Bioenerget.	37	17-23
Gruenau S.P., Oscar K.J., Folker M.T. & Rapoport S.I.	1982	Absence of microwave effects on blood-brain barrier permeability to (14C)sucrose in the conscious rat	Exp. Neurol.	75	299-307
Hamnerius Y., Rasmuson A. & Rasmuson B.	1985	Biological effects of high-frequency electromagnetic fields on Salmonella typhymurium and Drosophila melanogaster	Bioelectromagnetics	6	405-414
Hardell L., Näsman A., Pahlson A., Hallquist A. & Hansson Mild K.	1999	Use of cellular telephones and risk for brain tumours: A case-control study	Int. J. Oncol.	15	113-116
Hayes R.B., Morris Brown L., Pottern L.M., Gomez M., Kardaun J.W.P.F., Hoover R.N., O'Connell K.J., Sutzman R.E. & Javadpour N.	1990	Occupation and Risk for Testicular Cancer: A Case-Control Study	Int J Epidemiology	19,4	825-831

Heikkinen P., Kumlin T., Laitinen J.T., Komulainen H. & Juutilainen J.	1999	Chronic exposure to 50-Hz magnetic fields or 900-MHz electromagnetic fields does not alter nocturnal 6-hydroxymelatonin sulfate secretion in CBA/S mice	Electro-Magnetobiology	18, 1	33-42
Hentschel K., Neuschulz H., Freude G., Ullsperger P., Kaul G., Ruppe I., Eggert S., Enderlein G. & Keitel J.	1999	Einfluss von niederfrequent gepulsten Hochfrequenzfeldern auf den Menschen	Schriftenreihe der BAA	Fb 868	
Hentschel K., Neuschulz H., Ruppe I., Eggert S., Freude G., Kaul G., Enderlein G. & Keitel J.	1999	Untersuchungen zum Einfluß von niederfrequent gepulsten elektromagnetischen Feldern von GSM-Mobiltelefonen auf den Menschen	in Krause et al. 1999		1179-1190
Higashikubo R., Culbreth V.O., Spitz D.R., LaRegina M.C., Pickard W.F., Straube W.L., Moros E.G. & Roti Roti J.L.	1999	Radiofrequency electromagnetic fields have no effect on the *in vivo* proliferation of the 9L brain tumor	Rad. Res.	152	665-671
Hjollund N.H.I., Bonde J.P.E. & Skotte J.	1997	Semen analysis of personnel operating military radar equipment	Reprod. Toxicol.	11,6	897
Hocking B., Gordon I.R., Grain H.L. & Hatfield G.E.	1996	Cancer Incidence and mortality and proximity to TV towers	Med. J. Australia	165	601-605
Holly E.A., Aston D.A., Ahn D.K. & Smith A.H.	1996	Intraocular melanoma linked to occupations and chemical exposures	Epidemiology	7 (1)	55-61
ICNIRP	1998	Guidelines for limiting exposure to time-varying electric, magnetic. And electromagnetic fields (up to 300 GHz)	Health Phys.	74	494-522
Imaida K., Taki M, Yamaguchi T, Ito T, Watanabe S, Wake K, Aimoto A, Kamimura Y, Ito N & Shirai T.	1998a	Lack of promoting effects of the electromagnetic near-field used for cellular phones (929.2 MHz) on rat liver carcinogenesis in a medium-term liver bioassay	Carcinogenesis	19	311-314
Imaida K., Taki M., Watanabe S. Kamimura Y., Ito T., Yamaguchi T., Ito N. & Shirai T.	1998b	The 1.5 GHz electromagnetic near-field used for cellular phones does not promote rat liver carcinogenesis in a medium-term liver bioassay	Jpn. J. Cancer Res.	89	995-1002
Inaba R., Shishido K.-I., Okada A. & Moroji T.	1992	Effects of whole body microwave exposure on rat brain contents of biogenic amines	Eur. J. Appl. Physiol.	65	124-128
Inalöz S.S., Dasdag S., Ceviz A. & Bilici A.	1997	Acceptable radiation leakage of microwave ovens on pregnant and newborn rat brains	Clin. Exp. Obstet. Gynecol.	24	215-219
Ivaschuk O.I., Jones R.A., Ishida-Jones T., Haggren W., Adey W.R. & Phillips J.L.	1997	Exposure of nerve growth factor-treated PC12 rat pheochromocytoma cells to a modulated radiofrequency field at 836.55 MHz	Bioelectromagnetics	18	223-229
Jensh R.P., Vogel W.H. & Brent R.L.	1983	An evaluation of the teratogenic potential of protracted exposure of pregnant rats to 2450 MHz microwave radiation: II Postnatal psychophysiologic analysis	J. Toxicol. Environ. Health	11	37-59
Jensh R.P., Weinberg I. & Brent R.L.	1983a	An evaluation of the teratogenic potential of protracted exposure of pregnant rats to 2450-MHz microwave radiation: I. Morphologic analysis at term	J. Toxicol. Environ. Health	11	23-35
Källén B., Malmquist G. & Moritz U.	1982	Delivery outcome among physiotherapists in Sweden: is non-ionizing radiation a fetal hazard?	Arch. Environ. Health	37 (2)	81-85
Kass G.E.N. & Orrenius S.	1999	Calcium signalling and cytotoxicity	Env. Health Perspect.	107, S1	25-35
Kerbacher J.J., Meltz M.L. & Erwin D.N.	1990	Influence of radiofrequency radiation on chromosome aberrations in CHO cells and its interaction with DNA damaging agents	Radiat. Res.	123	311-319
Khillare B. & Behari J.	1998	Effect of amplitude-modulated radiofrequency radiation on reproduction pattern in rats	Electro-Magnetobiology	17 (1)	43-55
Kirschvink J.L.	1996	Microwave absorption by magnetite: a possible mechanism for coupling nonthermal levels of radiation to biological systems	Bioelectromagnetics	17	187-194
Klitzing, L. von	1995	Low Frequency pulsed electromagnetic fields influence EEG of man	Physica Medica	11	77-80
Kolodynski A.A. & Kolodynska V.V.	1996	Motor and psychological functions of school children living in the area of the Skrunda radio location station in Latvia	Sci Total Environ	180	87-93 (51-
Kowalczuk C.I., Saunders R.D. & Stapleton H.R.	1983	Sperm count and sperm abnormality in mice after exposure to 2.45 GHz microwave radiation	Mutat. Res.	122	155-161
Krause D., Mullins J.M., Penafiel L.M., Meister R. & Nardone R.M.	1991	Microwave exposure alters the expression of 2-5A-dependent RNAse	Rad. Res.	127	164-170
La Cara F., Scarfi M.R., D'Auria S., Massa R., d'ambrosio G., Franceschetti G., Rossi M. & De Rosa M.	1999	Different effects of microwave energy and conventional heat on the activity of a thermophilic beta-galactosidase from bacillus acidocaldarius	Bioelectromagnetics	20	172-176
Lagorio S., Rossi S., Vecchia P., De Santis M., Bastianini L., Fusilli M., Ferrucci A., Desideri E. & Comba P.	1997	Mortality of plastic-ware workers exposed to radiofrequencies	Bioelectromagnetics	18	418-421
Lai H.	1992	Research on the neurological effects of nonionizing radiation at the university of Washington	Bioelectromagnetics	13	513-526
Lai H. & Singh N.P.	1995	Acute low-intensity microwave exposure increases DNA single-strand breaks in rat brain cells	Bioelectromagnetics	16	207-210
Lai H. & Singh N.P.	1996	Single- and double-strand DNA breaks in rat brain cells after acute exposure to radiofrequency electromagnetic radiation	Int. J. Radiat. Biol.	69	513-521

Lai H. & Singh N.P.	1997	Melatonin and a spin trap compound block radiofrequency electromagnetic radiation-induced DNA-strand breaks in rat brain cells	Bioelectromagnetics	18	446-454
Lai H., Carino M.A., Horita A. & Guy A.W.	1989a	Low-level microwave irradiation and central cholinergic activity: a dose-response study	Bioelectromagnetics	10	203-208
Lai H., Carino M.A., Horita A. & Guy A.W.	1989b	Low-level microwave irradiation and central cholinergic systems	Pharmacol. Biochem. Behav.	33	131-138
Lai H., Carino M.A., Horita A. & Guy A.W.	1990	Corticotropin-releasing factor antagonist blocks microwave-induced decreases in high-affinity choline uptake in the rat brain	Brain Res. Bull.	25	609-612
Lai H., Horita A. & Guy A.W.	1988	Acute low-level microwave exposure and central cholinergic activity: studies on irradiation parameters	Bioelectromagnetics	9	355-362
Lai H., Horita A. & Guy A.W.	1994	Microwave irradiation affects radial-arm maze performance in the rat	Bioelectromagnetics	15	95-104
Lai H., Horita A., Chou C.-K. & Guy A.W.	1987	Low-level microwave irradiations affect central cholinergic activity in the rat	J. Neurochem.	48 (1)	40-45
Lancranjan I., Maicanescu M., Rafaila E., Klepsch I. & Popescu H.I.	1975	Gonadic function in workman with long-term exposure to microwaves	Health Physics	29	381-383
Larsen A.I.	1991b	Congenital malformations and exposure to high-frequency electromagnetic radiation among Danish physiotherapists	Scand. J. Environ. Health	17	318-323
Larsen A.I., Olsen J. & Svane O.	1991a	Gender specific reproductive outcome and exposure to high-frequency electromagnetic radiation among physiotherapists	Scand. J. Environ. Health	17	324-329
Lary J.M., Conover D.L. & Johnson P.H.	1983	Absence of embryotoxic effects from low-level (non-thermal) exposure of rats to 100 MHz radiofrequency radiation	Scand. J. Work Environ. Health	9	120-129
Lin R.S., Dischinger P.C., Cond J. & Farrell K.P.	1985	Occupational exposure to electromagnetic fields and the occurrence of brain tumors	J. Occup. Med.	27, 6	413-419
Lin-Liu S. & Adey W.R.	1982	Low frequency amplitude modulated microwave fields change calcium efflux rates from synaptosomes	Bioelectromagnetics	3	309-322
Litovitz T.A.	1998	Can electromagnetic fields modify the activity of ornithine decarboxylase (ODC)? What happens with the 'coherence time' effect? A reply to the comment by R. Glaser	Bioelectrochem. Bioenerget.	46	303-306
Litovitz T.A., Krause D., Penafiel M., Elson E.C. & Mullins J.M.	1993	The role of coherence time in the effect of microwaves on Ornithine Decarboxylase activity	Bioelectromagnetics	14	395-403
Litovitz T.A., Penafiel L.M., Farrel J.M., Krause D., Meister R. & Mullins J.M.	1997	Bioeffects induced by exposure to microwaves are mitigated by superposition of ELF noise	Bioelectromagnetics	18	422-430
Liu L.-M. & Cleary S.F.	1995	Absorbed energy distribution from radiofrequency electromagnetic radiation in a mammalian cell model: effect of membrane-bound water	Bioelectromagnetics	16	160-171
Lloyd D.C., Saunders R.D., Finnon P. & Kowalczuk C.I.	1984	No clastogenic effect from *in vitro* microwave irradiation of Go human lymphocytes	Int J Radiat Biol	46	135-141
Lloyd D.C., Saunders R.D., Moquet J.E. & Kowalczuk C.I.	1986	Absence of chromosomal damage in human lymphocytes exposed to microwave radiation with hyperthermia	Bioelectromagnetics	7	235-237
Lyle D.B., Schechter P., Adey W.R. & Lundak R.L.	1983	Suppression of T-lymphocyte cytotoxicity following exposure to sinusoidally amplitude-modulated fields	Bioelectromagnetics	4	281-292
Maes A., Collier M., Gorp U. van, Vandoninck S. & Verschaeve L.	1997	Cytogenetic effects of 935.2-MHz (GSM) microwaves alone and in combination with mitomycin C	Mutat. Res.	393	151-156
Maes A., Collier M., Slaets D. & Verschaeve L.	1995	Cytogenetic effects of microwaves from mobile communication frequencies (945 MHz)	Electro- Magnetobiol.	14	91-98
Maes A., Collier M., Slaets D. & Vershaeve L.	1996	945 MHz microwaves enhance the mutagenic properties of mitomycin C	Environ. Mol. Mutagen.	28	26-30
Maes A., Verschaeve L., Arroyo A., Wagter C. De & Vercruyssen L.	1993	*In vitro* cytogenetic effects of 2450 MHz waves on human peripheral blood lymphocytes	Bioelectromagnetics	14	495-501
Magras I.N. & Xenos T.D.	1997	RF radiation-induced changes in the prenatal development of mice	Bioelectromagnetics	18	455-461
Malyapa R., Ahern E.W., Straube W.L., Moros E.G., Pickard W.F. & Roti Roti J.L.	1997a	Measurement of DNA damage after exposure to 2450 MHz electromagnetic radiation	Radiat. Res.	148	608-617
Malyapa R., Ahern E.W., Straube W.L., Moros E.G., Pickard W.F. & Roti Roti J.L.	1997b	Measurement of DNA damage after exposure to electromagnetic radiation in the cellular phone communication frequency band (835.62 and 847.74 MHz)	Radiat. Res.	148	618-627
Malyapa R.S., Ahern E.W., Bi C., Straube W.L., LaRegina M., Pickard W.F. & Roti Roti J.L.	1998	DNA damage in rat brain cells after *in vivo* exposure to 2450 MHz electromagnetic radiation and various methods of euthanasia	Radiat. Res.	149	637-645
Manikowska E., Luciani J.M., Servantie B., Czerski P., Obenovitch J. & Stahl A.	1979	Effects of 9.4 GHz microwave exposure on meiosis in mice	Experentia	35 (3)	388-390
Manikowska-Czerska E, Czerski P. & Leach W.M.	1985	Effects of 2.45 GHz microwaves on meiotic chromosomes of male CBA/CAY mice	J. Heredity	76	71-73
Mann K. & Röschke J.	1996	Effects of pulsed high-frequency electromagnetic fields on human sleep	Neuropsychobiology	33	41-47

Mann K. & Röschke J.	1996	REM-Suppression unter dem Einfluß digitaler Funktelefone	Wien. Med. Wschr.	146	285-286
Mann K., Röschke J., Connemann B. & Beta H.	1998	No effects of pulsed high-frequency electromagnetic fields on heart rate variability during human sleep	Neuropsychobiology	38	251-256
Mann K., Wagner P., Brunn G., Hassan F., Hiemke C. & Röschke J.	1997	Effects of pulsed high-frequency electromagnetic fields on the neuroendocrine system	Neuroendocrinology	67	139-144
Marcickiewicz J., Chazan B., Niemiec T., Sokolska G., Troszynski M., Luczak M. & Szmigielski S.	1986	Microwave radiation enhances teratogenic effect of cytosine arabinoside in mice	Biol. Neonate	50	75-82
Marec F., Ondracek J. & Brunnhofer V.	1985	The effect of repeated microwave irradiation on the frequency of sex-linked recessive lethal mutations in Drosophila melanogaster	Mutat. Res.	157	163-167
McKenzie D.R., Yin Y. & Morrell S.	1998	Childhood incidence of acute lymphoblastic leukemia and exposure to broadcast radiation in Sydney - a second look	Aust. N. Z. J. Public Health	22	360-367
Meltz M., Eagan P. & Erwin D.N.	1989	Absence of mutagenic interaction between microwaves and mitomycin C in mammalian cells	Environ. Molec. Mutagen.	13	294-303
Meltz M.L., Eagan P. & Erwin D.N.	1990	Proflavin and microwave radiation: absence of mutagenic interaction	Bioelectromagnetics	11	149-157
Meltz M.L., Walker K.A. & Erwin D.N.	1987	Radiofrequency (microwave) radiation exposure of mammalian cells during UV-induced DNA-repair synthesis	Radiat. Res.	110	255-266
Mickley A., Cobb B.L., Mason P. & Farrel S.	1998	Thermal tolerance reduces hyperthermia-induced disruption of working memory: a role for endogenous opiates?	Physiol. Behav.	63 (5)	855-865
Mickley G.A. & Cobb B.L.	1998	Thermal tolerance reduces hyperthermia-induced disruption of working memory: a role for endogenous opiates?	Physiology & Behavior	63	855-865
Mickley G.A., Cobb B.L., Mason P.A. & Farrell S.	1994	Disruption of a putative working memory task and selective expression of brain c-fos following microwave-induced hyperthermia	Physiol. Behav.	55 (6)	1029-1038
Milham S.	1985	Mortality in workers exposed to electromagnetic fields	Environ. Health Perspect.	62	297-300
Milham S.	1985	Silent keys: leukemia mortality in amateur radio operators	Lancet	6. April	812
Milham S.	1988	Increased mortality in amateur radio operators due lymphatic and hematopoietic malignancies	Am. J. Epidemiol.	127 (1)	50-54
Milhem S.	1982	Mortality from leukemia in workers exposed to electrical and magnetic fields	New Engl. J. Med.	307	249
Moriyama E., Salcman M. & Broadwell R.D.	1991	Blood-brain barrier alterations after microwave-induced hyperthermia is purely a thermal effect: I Temperature and power measurements	Surg. Neurol.	35	177-182
Moulder J.E., Erdreich L.S., Malyapa R.S., Merritt J., Pickard W.F & Vijayalaxmi	1999	Cell Phones and Cancer: What is the Evidence for a Connection	Radiat. Res.	151	513-531
Nawrot P.S., McRee D.I. & Galvin M.J.	1985	Teratogenic, biochemical, and histological studies with mice prenatally exposed to 2.45-GHz microwave radiation	Radiat. Res.	102	35-45
Neubauer C., Phelan A.M., Kues H. & Lange D.G.	1990	Microwave irradiation of rats at 2.45 GHz activates pinocytotic-like uptake of tracer by capillary endothelial cells of cerebral cortex	Bioelectromagnetics	11	261-268
Novoselova E.G., Fesenko E.E., Makar V.R. & Sadovnikov V.B.	1999	Microwaves and cellular immunity II. Immunostimulating effects of microwaves and naturally occurring antioxidant nutrients	Bioelectrochem. Bioenerget.	49	37-41
Oscar K.J. & Hawkins T.D.	1977	Microwave alteration of the blood-brain barrier system of rats	Brain Res.	126	281-293
Ouellet-Hellstrom R. & Stewart W.F.	1993	Miscarriages among female physical therapists who report using radio- and microwave-frequency electromagnetic radiation	Am. J. Epidemiol.	138	775-786
Pazmany T., Szkladanyi A. und Szabo L.D.	1990	The Effect of 2.45 GHz Microwave Irradiation on Human Peripheral Lymphocytes	Acta Biochim. Biophys. Hung.	25	157-163
Penafiel L.M., Litovitz T., Krause D., Desta A. & Mullins J.M.	1997	Role of modulation on the effect of microwaves on ornithine decarboxylase activity in L929 cells	Bioelectromagnetics	18	132-141
Phelan A.M., Lange D.G., Kues H.A. & Lutty G.A.	1992	Modification of membrane fluidity in melanin-containing cells by low level microwave radiation.	Bioelectromagnetics	13	131-146
Phillips J.L., Ivaschuk O., Ishida-Jones T., Jones R. A, Campbell-Beachler M. & Haggren W.	1998	DNA damage in Molt-4 T-lymphoblastoid cells exposed to cellular telephone radiofrequency fields *in vitro*	Bioelectrochem. Bioenerget.	45	103-110
Postow E. & Swicord M.L.	1996	Modulated fields and 'window' effects. In: Polk C. & Postow E.: Handbook of Biological Effects of Electromagnetic Fields, 2nd. Ed.	CRC Press, Boca Raton		535-580
Prato F.S., Wills J.M., Roger J., Frappier H., Drost D.J., Lee T.-Y., Shivers R.R. & Zabel P.	1994	Blood-brain barrier permeability in rats is altered by exposure to magnetic fields associated with magnetic resonance imaging at 1.5 T	Microscopy Res. Techn.	27	528-534
Preece A.W., Iwi G., Davies-Smith A, Wesnes K., Butler S., Lim E & Varey A.	1999	Effect of a 915-MHz simulated mobile phone signal on cognitive function in man	Int. J. Radiat. Biol	75	447-456
Preston E., Vavasour E.J. & Assenheim H.M.	1979	Permeability of the blood-brain barrier to mannitol in the rat following 2450 MHz microwave irradiation	Brain Research	174	109-117
Rama Rao G., Cain C.A., Lockwood J. & Tompkins W.A.F.	1983	Effects of microwave exposure on the hamster immune system. II. Peritoneal macrophage function	Bioelectromagnetics	4	141-155

Raslear T.G., Akyel Y., Bates F., Belt M. & Lu S.T.	1993	Temporal bisection in rats: the effects of high-peak-power pulsed microwave irradiation	Bioelectromagnetics	14 (5)	459-478
Reiser H., Dimpfel W. & Schober F.	1995	The influence of electromagnetic fields on human brain activity	Eur. J. Med. Res. 1: 27-32	1	27-32
Repacholi M.H.	1997	Radiofrequency field exposure and cancer: what do the laboratory studies suggest?	Environ. Health Perspectives	105 (Suppl 6)	1565-1568
Repacholi M.H.	1998	Low-level exposure to radiofrequency electromagnetic fields: health effects and research needs	Bioelectromagnetics	19	1-19
Repacholi M.H., Basten. A., Gebski V., Noonan D., Finnie J. & Harris A.W.	1997	Lymphomas in eμ-Pim 1 transgenic mice exposed to pulsed 900 MHz electromagnetic fields	Radiat. Res.	147	631-640
Robinette C.D., Silverman C. & Jablon S.	1980	Effects upon health of occupational exposure to microwave radiation (radar)	Am. J. Epidemiol.	112	39-53
Röschke J. & K. Mann	1997	No short-term effects of digital mobile radio telephone on the awake human electroencephalogram	Bioelectromagnetics	18	172-176
Rothman K.J., Loughlin J.E., Funch D.P. & Dreyer N.A.	1996	Overall mortality of cellular telephone customers	Epidemiology	7,3	303-305
Saffer J.D. & Profenno L.A.	1992	Microwave-specific heating affects gene expression	Bioelectromagnetics	13	75-78
Sagripanti J.-L. & Swicord M.L.	1986	DNA structural changes caused by microwave radiation	Int. J. Radiat. Biol.	50	47-50
Sagripanti J.-L., Swicord M.L. & Davis C.C.	1987	Microwave effects on plasmid DNA	Rad. Res.	110	219-231
Salford L.G., Brun A., Eberhardt J.L. & Persson B.R.R.	1993	Permeability of the blood brain barrier induced by 915 MHz electromagnetic radiation, continuous wave and modulated at 8, 16, 50 and 200 Hz	Bioelectrochem. Bioenerg.	30	293-301
Salford L.G., Brun A., Persson B.R.R. & Eberhardt J.	1993	Experimental studies of brain tumour development during exposure to continuous and pulsed 915 MHz radiofrequency radiation	Bioelectrochem. Bioenerg.	30	313-318
Salford L.G., Brun A., Sturesson K., Eberhardt J.L. & Persson B.R.R.	1994	Permeability of the blood brain barrier induced by 915 MHz electromagnetic radiation, continuous wave and modulated at 8, 16, 50 and 200 Hz	Micros. Res. Tech.	27	535-542
Santini R., Hosni M., Deschaux P. & Packeon H.	1988	B16 melanoma development in black mice exposed to low-level microwave radiation	Bioelectromagnetics	9	105-107
Sarkar S., Ali S. & Behari J.	1994	Effect of low power microwave on the mouse genome: a direct DNA analysis	Mutation Res.	320	141-147
Saunders R.D. & Kowalczuk C.I.	1981	Effects of 2.45 GHz microwave radiation and heat on mouse spermatogenic epithelium	Int. J. Radiat. Biol.	40	623-632
Saunders R.D., Darby S.C. & Kowalczuk C.I.	1983	Dominant lethal studies in male mice after exposure to 2.45 GHz microwave radiation	Mutat. res.	117	345-356
Saunders R.D., Kowalczuk C.I., Beechey C.V. & Dunford R.	1988	Studies on the induction of dominant lethals and translocations in male mice after chronic exposure to microwave radiation	Int. J. Radiat. Biol.	53	983-992
Saunders R.D., Sienkiewicz Z.J. & Kowalczuk C.I.	1991	Biological effects of electromagnetic fields and radiation	J. Radiol. Prot.	11, 1	27-42
Savitz D.A., Loomis D.P. & Tse C.K.J.	1998	Electrical occupations and neurodegenerative disease: analysis of U.S. mortality data	Arch. Environ. Health		71-74
Scarfi M.R., Lioi M.B., d'Ambrosio G., Massa R., Zeni O., Di Pietro R. & Di Berardino D.	1996	Genotoxic effects of mitomycin-C and microwave radiation on bovine lymphozytes	Electro- and Magneto	15 (2)	99-107
Scott G.	1992	Free radicals provide a mechanism for EMFs to promote cancer	Electromagn. News	3	6-8
Shackelford R.E., Kaufmann W.K. & Paules R.S.	1999	Cell cycle control, checkpoint mechanisms, and genotoxic stress	Environ. Health Perspect.	107, S1	5-24
Smialowicz R.J., Kinn J.B. & Elder J.A.	1979	Perinatal exposure of rats to 2450-MHz CW microwave radiation: Effects on lymphocytes	Radio Sci.	14, 6S	147-153
Smialowicz R.J., Rogers R.R., Garner R.J., Riddle M.M., Luebke R.W. & Rowe D.G.	1983	Microwaves (2.450 MHz) suppress murine natural killer cell activity	Bioelectromagnetics	4	371-381
Smulevich V.B., Solionova L.G. & Belyakova S.V.	1999	Parental occupation and other factors and cancer risk in children: II occupational factors	Int. J. Cancer	83 (7)	718-722
Somosy Z., Thuroczy G. & Kovacs J.	1993	Effects of modulated and continuous microwave irradiation on pyroantimonate precipitable calcium content in junctional complex of mouse small intestine	Scanning Microscopy	7	1255-1261
Stagg R.B., Thomas W.J., Jones R.A. & Adey W.R.	1997	DNA synthesis and cell proliferation in C6 glioma and primary glial cells exposed to a 836.55 MHz modulated radiofrequency field	Bioelectromagnetics	18	230-236
Szmigielski S.	1996	Cancer morbidity in subjects occupationally exposed to high frequency (radiofrequency and microwave) electromagnetic	Sci. Total Environ.	180	9-17
Szmigielski S., Szudinski A., Pietraszek A., Bielec M. & Wrembel J.K.	1982	Accelerated development of spontaneous and benzopyrene-induced skin cancer in mice exposed to 2450-MHz microwave radiation	Bioelectromagnetics	3	179-191

Szudzinski A., Pietraszek A., Janiak M., Wrembel J., Kalczak M. & Szimgielski S.	1982	Acceleration of the development of benzopyrene-induced skin cancer in mice by microwave radiation	Arch. Dermatol. Res.	274	303-312
Thomas T.L., Stolley P.D., Stemhagen A., Fontham E.T.H., Bleecker M.L., Stewart P.A. & Hoover R.N.	1987	Brain tumor mortality risk among men with electrical and electronics jobs: a case-control study	JNCI	79	233-238
Thuroczy G., Kubinyi G., Bodo M., Bakos J. & Szabo L.D.	1994	Simultaneous response of brain electrical activity (EEG) and cerebral circulation (REG) to microwave exposure in rats	Rev. Environ. Health	10, 2	135-148
Toler J., Shelton W.W., Frei M.R., Merritt J.H. & Stedham M.A.	1997	Long-term, low-level exposure of mice prone to mammary tumors to a 435 MHz radiofrequency radiation	Radiat. Res.	148	227-234
Törnqvist S., Knave B., Ahlbom A. & Persson T.	1991	Incidence of leukemia and brain tumors in some 'electrical occupations'	Br. J. Ind. Med.	48	597-603
Tynes T., Andersen A. & Langmark F.	1992	Incidence of cancer in Norwegian workers potentially exposed to electromagnetic fields	Am. J. Epidemiol.	136 (1)	81-88
Tynes T., Hannevik M., Anderson A., Visnes A.I. & Haldorsen T.	1996	Incidence of breast cancer in Norwegian female radio and telegraph operators	Cancer Causes Contr.	7	197-204
Vaagerö D., Ahlbom A., Olin R. & Sahlsten S.	1985	Cancer morbidity among workers in the telecommunications industry	Br. J. Ind. Med.	42 (3)	191-195
Varma M.M. & Traboulay E.A.	1977	Comparison of native and microwave irradiated DNA	Experientia	33	1649-1650
Velizarov S., Raskmark P. & Kwee S.	1999	The effects of radiofrequency fields on cell proliferation are non-thermal	Bioelectrochemistry	48	177-180
Verschaeve L & Maes A.	1998	Genetic, carcinogenic and teratogenic effects of radiofrequency fields	Mutat. Res.	410	141-165
Verschaeve L.	1995	Can non ionizing radiation induce cancer?	Cancer Journal 8:237	8	237-249
Vijayalaxmi, Frei M.R., Dusch S.J., Guel V., Meltz M.L. & Jauchem J.R.	1997a	Frequency of micronuclei in the peripheral blood and bone marrow of cancer-prone mice chronically exposed to 2450 MHz radiofrequency radiation	Rad. Res.	147	495-500
Vijayalaxmi, Mohan N., Meltz M.L. & Wittler M.A.	1997 b	Proliferation and cytogenetic studies in human blood lymphocytes exposed *in vitro* to 2450-MHz radiofrequency radiation	Int. J. Radiat. Biol.	72	751-757
Vollrath L., Spessert R., Kratzsch T., Keiner M. & Hollmann H.	1997	No short-term effects of high-frequency electromagnetic fields on the mammalian pineal gland	Bioelectromagnetics	18	376-387
Vorobyov V.V., Galchenko A.A., Kukushkin N.I. & Akoev I.G.	1997	Effects of weak microwave fields amplitude modulated at ELF on EEG of symmetric brain areas in rats	Bioelectromagnetics	18	293-298
Wagner P., Röschke J., Mann K., Hiller W. & Frank C.	1998	Human sleep under the influence of pulsed radiofrequency electromagnetic fields: a polysomnographic study using standardized conditions	Bioelectromagnetics	19	199-202
Wang B. & Lai H.	2000	Acute exposure to pulsed 2450-MHz microwaves affects water-maze performance of rats	Bioelectromagnetics	21	52-56
Weyandt T.B., Schrader S.M., Turner T.W. & Simon S.D.	1996	Semen analysis of military personnel associated with military duty assignments	Reprod. Toxicol.	10,6	521-528
Williams W.M., Lu S.-T., Cerro M. del & Michaelson S.M.	1984b	Effect of 2450 MHz microwave energy on the blood-brain barrier to hydrophilic molecules. D. Brain temperature and blood-brain barrier permeability to hydrophilic tracers	Brain Res. Rev.	7	191-212
Wolke S., Neibig U., Elsner R., Gollnick F. und Meyer R.	1996	Calcium homeostasis of isolated heart muscle cells exposed to pulsed high-frequency electromagnetic fields	Bioelectromagnetics	17	144-153
Wu R.Y., Chiang H., Shao B.J., Li N.G. & Fu Y.D.	1994	Effects of 2.45 GHz microwave radiation and phorbol ester 12-o-tetradecanoylphorbol-13-acetate on dimethylhydrazine-induced colon cancer in mice	Bioelectromagnetics	15	531-538
Yang H.K., Cain C.A., Lockwood J. § Tompkins W.A.F.	1983	Effects of microwave exposure on the hamster immune system. I. Natural killer cell activity	Bioelectromagnetics	4	123-139
Yao K.T.S.	1978	Microwave radiation-induced chromosomal aberrations in corneal epithelium of Chinese hamsters	J. Hered.	69	409-412
Yao K.T.S.	1982	Cytogenetic consequences of microwave irradiation on mammalian cells incubated *in vitro*	J. Hered.	73	133-138
Zhao Z., Zhang S., Zho H., Zhang S., Su J., & Li L.	1994	The effects of radiofrequency (<30 MHz) radiation in humans	Rev. Environ. Health	10	213-215

15) THOUSANDS OF REPORTS OF HEALTH EFFECTS FROM SMART METERS/SMART GRID TO TEXAS AND CALIFORNIA PUCs

http://stopsmartgrid.org/evidence/

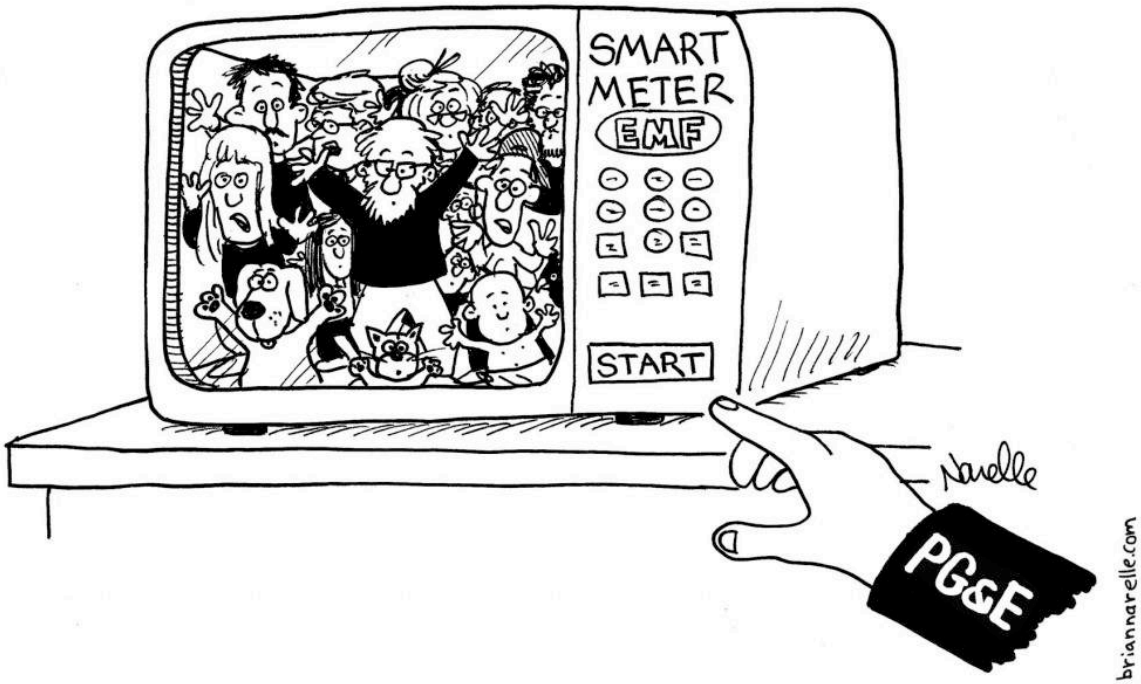
*Click the Above Link For nearly **2000 health complaints regarding smart meters and smart grid** to the California PUC and Over **700 heath complaints from smart meters and smart grid** to the Texas PUC.*

The below link contains health complaints posted on EMF Safety Network from US citizens currently suffering from smart meter and smart grid roll out. These are just a few examples of the health complaints. There are HUNDREDS more.

Smart Meter Health Complaints

http://emfsafetynetwork.org/smart-meters/smart-meter-health-complaints/
Do you have headaches, ringing in the ears, or sleep problems since utility smart meters were deployed? *You are not alone!*

Smart meters emit radiation- which is making people sick!



List of symptoms:

- Sleep problems (insomnia, difficulty falling asleep, night waking, nightmares)
- Stress, agitation, anxiety, irritability
- Headaches, sharp pain or pressure in the head
- Ringing in the ears, ear pain, high pitched ringing
- Concentration, memory or learning problems
- Fatigue, muscle or physical weakness
- Disorientation, dizziness, or balance problems
- Eye problems, including eye pain, pressure in the eyes,
- Cardiac symptoms, heart palpitations, heart arrhythmias, chest pain
- Leg cramps, or neuropathy
- Arthritis, body pain, sharp, stabbing pains
- Nausea, flu-like symptoms
- Sinus problems, nose bleeds
- Respiratory problems, cough, asthma
- Skin rashes, facial flushing
- Urinary problems
- Endocrine disorders, thyroid problems, diabetes
- High blood pressure
- Changes in menstrual cycle
- Hyperactivity or changes in children's behavior

- Seizures
- Recurrence of cancer

2013 We had a Smart Meter installed on our home. I got sick and two weeks ago had a mini-stroke. We took the meter off our home after sending Central Hudson (our utility company) several sets of documents – detailing my illness and then my hospitalization – and they did nothing and did not even respond to our requests. After my stroke, we ordered an analog meter online and replaced their radiating meter. We video taped it and sent their meter back to them with a letter, along with all the other correspondence we had sent (return receipt and notarized).
The following Monday the electric company came to our home, with no notice nor explanation, and physically, right in front of me, cut our electric lines with a huge pair of clippers! — New York

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2013/ I am the proud parent of six, of the six children we have four children who are under the age of six. In July of last year the LADWP placed on our home a RF meter, the RF meter was placed on the back of our home which is directly located about 25 to 30 feet away from the LADWP power pole that is located on our property. In July of last year our children started to exhibit health symptoms and health signs that alarmed myself and my husband. The children began to have fevers out of no where, essentially their bodies were boiling and their fevers would go from 101 to 104 and sometimes to 105. My husband is a Clinical Partner at Cedar Sinai Hospital in the ICU so he is versed in the area of taking care of patients in extreme health decline, but he was not prepared to handle the weekly and monthly bouts that our smaller children began to have. Our children also began to have problems with the inability to control their bodily fluids, our five year old began peeing and pooping herself, our four year began to display the same problems, soon many of the smaller children were all displaying these symptoms and concerns. The children became depressed, and essentially we began to realize that our children were not the children who we cared for prior to the RF meter being placed on our property. We were the only family in our area to have this new meter so we do not have a frame of reference in our community to measure the health side effects against. Please help us, we are good honest people who have suffered for the past few months trying to put the pieces of this puzzle together.
[Admin's note: *The mother wrote that after the Smart Meter was removed in January the children's symptoms "diminished greatly, they no longer get high fevers, or suffer from loss of their bodily function."* Meanwhile LADWP has terminated their power.]

West Kelowna man claims Smart Meters are killing him "…an Okanagan man claims the meters may be interfering with an important medical device – his pacemaker. Jerry Smith, 70, of West Kelowna is partially paralyzed as a result of the 10 strokes he's had since last August….

I am an engineer. I have used technology my entire adult life – cell phones, smart phones, wi-fi, laptops, you name it. I really enjoyed all of this and had no issues or fears related to technology.

Then, when a bank of smart meters were put next to our apartment, both my wife and I starting experiencing headaches, insomnia, heart palpitations and tinnitus. Within a couple weeks, I could no longer use a cell phone without the same symptoms. Within a month I could feel the microwave radiation from cell towers. I have had to completely change my life because of this. Jeromy [Testimony Jeromy submitted to the CPUC]

"Is there a list of safe communities with no smart meters? Our whole family is being sickened by the smart meters around us and we need to find a place to live quickly."
"We are just miserable here. We can't sleep at night, are dizzy, have headaches, ear pain, and more. We also own our home so it is not easy to just pick up and get away from the smart meters." CA. 2013

Sick with palpitations, chest pain, insomnia, dizziness…
I managed to have smart meter installation delayed at my house, but suddenly became sick overnight with palpitations, chest pain, insomnia, dizziness, inability to concentrate and memory loss and fainting spells. AFTER becoming sick I found out that the day I became suddenly sick was the day the smart meter roll-out was completed in my area and the smart meters were remotely turned on from base.
I can no longer drive, I can't work (I'm a doctor), I have to go and sleep at my mother in law's place (there are no smart meters there yet).
My life is completely ruined and the energy companies and members of Victorian Parliament completely ignore me. Two doctors have confirmed my disability is entirely due to my sensitivity to smart meters' radio transmission and I am 100% sure of that as I can always tell accurately if I am in a smart metered area or not.
We are now planning to move to South Australia to survive. What is happening in Victoria is a complete breakdown of democracy and an affront to social justice of enormous proportions and implications.
What if this is happening to an old lady living alone? Where can she go? We are all morally obliged to speak up and do something about it, if not for ourselves, for the vulnerable amongst us that, if affected, could not do anything about it.

I had no idea that a smart meter would pose a hazard to my health when I agreed to let them install one on my home. Shortly after the smart meter was installed my health took a terrible downturn. I began having heart palpitations, trouble sleeping, unexplained anxiety attacks, dizzy spells, nausea and fatigue. I have been battling anxiety for months and I had no idea why. I've never had these types of symptoms plague me like this before. Then I found out that so many others have had the same reactions to smart meters in their homes and neighborhoods. Smart meters need to be outlawed and all of them must be removed at once. There are enough toxins in our food and the environment without this happening too. I hope I am able to get mine removed, but from what I've read Southern California Edison isn't cooperating. H .M. Orange CA

Since the new Smart Meter has been installed my wife has had a ringing in her ears. The only time she has this is in our home. Outside of the house she does not have the problem. J. F. Sacramento CA

I was not asked permission to have the Smart Meter installed. In fact, when your representative/installer came to my door informing me he would be installing the meter, I specifically told him that I did not want it installed. He told me that I didn't have a choice in the matter.
I am plagued with various health issues because of the Smart Meters, such as insomnia, constant headaches, blurred vision and ringing in my ears, and other various aches and pains. I understand that others are suffering from various health issues throughout the state and country as well. I do not want this device on my home or in my neighborhood. I want the old analog meter re-installed. I also do not want the new digital meter installed. I specifically want the old analog back which worked just fine. I want this Smart Meter removed now! A.S. Bakersfield CA

For the past year, I have been suffering health effects due to the installation of a Smart Meter at my home and the other homes in my neighborhood. I have experienced migraines, disrupted sleep, and electronic sensitivity so that I was unable to use a computer or my cellphone without immediate nausea and headache. I feel constant low-level anxiety when in my house which "magically" goes away every single time we have a power outage. My husband has developed migraines, disrupted sleep, and tinnitis. I am concerned for the long term health consequences on us and on my daughter who is almost 3.
I have called PG&E and they refuse to remove the Smart Meter from my house. Other electricians say that they cannot replace the meter with an analog variety because it would be illegal. This product is making me sick, and even with the money to pay for it, I am not allowed to have it removed.
I would like to see Smart Meters pulled from the market until thorough testing is done and they can be proved safe. It is the responsibility of our government to protect public health from polluting corporations. Charging for the right to "opt-out" is criminal because it subjects the poor to poisonous health effects, and also because people will still receive exposure from their neighbors' properties, especially in urban population-dense environments.
PG&E cannot be relied upon to treat us fairly–my health just does not figure into their bottom line. Sometimes we need people with power to stand up for us.

I have been suffering since the installation of 3 meters in my complex (of 12 units) and from larger multi-unit complexes on both sides of where I live. This means that the radiation coming off all of these meters encroach on me, even though I have opted out and do not have one….Each day I awake with my head buzzing. I now have fatigue and headaches, nausea unexplained and nosebleeds at the oddest times for no other reason. I have lost so many days of working (I work from home) and now there is no place to go. Our entire county, once a pristine, safe and desirable place to call home is now a sea of massive radiation from the thousands of smart meters now installed.

We didn't even know the meter was there when we moved in the house late April, 2011. We'd been feeling strong and well. Suddenly our health started deteriorating rapidly. It was until end of May that I saw the meter and red flags went off. I have been avoiding all

types of radiation since the 80's due to poor health…and here it was now permanently attached to my bedroom wall!! We had no place to go. Complaints and pleas to the utility companies were absolutely fruitless. We have removed it ourself.

I have been suffering horrible migraine headaches since a SmartMeter was installed on my home in the fall of 2010. The meter was installed without my permission. When the installer arrived unannounced, I happened to be home. I told him I did not want a Smartmeter. He responded by telling me I had no choice and walked right in my gate and installed it.

It took almost a year of 15-18 debilitating migraine level headaches before the cause was discovered. I saw doctors and had blood tests, MRI's CT scans, took migraine medications all with no relief. I kept a headache journal as recommended by headache specialists at UCSF and found no connection to headache development and diet, activity, etc. Looking at every variable possible, it was finally discovered that when I am around Smartmeters, I get headaches. When I am not, I don't get headaches.

I am a high school teacher and was able to go visit my Mom in a neighborhood that has no Smartmeters when school let out in June of 2011. For my 9 day visit with my mother, I had no headaches. When I returned home, the headaches resumed on my first day back. The Smartmeter was then suspected. I shielded the SM with simple aluminum shielding, and the migraine headache significantly reduced to a normal headache. When I remove the shield the intense migraines come back; replace the shield, they go away. The shielding is not 100% blockage. I need this meter completely off my home!!

I cannot walk my dog in my own neighborhood. All the buzz from my neighbors meters make me dizzy and don't help my headaches!! I feel trapped. There aren't many places to escape the horrible effects of these meters because they are everywhere. I love my job and I love where I live, but I feel I am being forced to leave. I cannot believe this is happening in this country!

The longer I am exposed to this SmartMeter, the more sensitive I am becoming. My doctor says I have developed electrical sensitivity. I am miserable and there are some days I wish someone would just shoot me. These SmartMeters and the technology they use have turned me from a happy and productive member of society, into a desperate and miserable person. Please help!!!!!!!!

I have been severely harmed by the installation of two smart meters on my family's home where I reside with my elderly parents and nephew.

I was forced to go to the emergency room only three hours after the two meters where installed on our home (one for gas and one for electric)from severe nausea, heart palpitations and a severe headache.

After several days, with the help of several highly trained medical doctors and a PA at my personal doctor's office, I finally found a medication that allowed me to stay home and assisted me in not having to continue to visit hospital services.

However, though the nausea was lessen by the mediation they gave me, which by the way is what they give to people who have radiation poisoning, it's side affects where too severe (mild to severe constipation and cramping leading to the need for more medical treatments)to continue for more than a few weeks. I was lucky enough to find an Acupuncturist who helped with these symptoms so at least I can now manage my pain.

I also suffered severe headaches (one meter was right outside my room, only two feet from my bed) and I was forced to move from a private room in front of the family house into the back of the house where the pain is much less.
Now I live my life in our family's den, always intruded upon by the need for my parents and other family members who reside here to work in the same area. I have lost all my privacy and I still suffer headaches every day now. I fear my health is also deteriorating as I keep getting colds. I have had one every month since the smart meters where installed. Even in the warm weather. My immune system is being affected negatively.
My only hold on my sanity is my friends and loving mother. Otherwise I would have given up on living months ago. I hold on though I doubt I can withstand a flu or other immune compromised illness. My final act is to stop smart meters here on this planet, if at all feasible.
As I already have fibromyalgia and acid reflex, this is probably the final nail in the coffin for my health. Please stop all smart meter installations and try to get all the ones already installed off people's homes and residences and businesses. I can't hardly go anywhere now without an instant migraine from the fact they are installed everywhere. I hate to think what they are doing to everyone's health in my community. It makes me ill thinking how it is harming our children and elderly right now.
The below link contains the results of a smart meter/health effects survey EMF Safety Network Conducted.

Survey results: wireless meters impact health and safety

http://emfsafetynetwork.org/?p=5826

16) SMART GRID VIOLATES ADA

Smart grid and smart meters create untenable, basic lifestyle problems, including being unable to inhabit ones own home. People who are sensitive to microwave radiation are forced to flee their home, however, sleeping in the street and in their car is not much of a better alternative now due to smart grid transmitters and repeaters blanketing entire neighborhoods and communities.

Not only do smart meters and smart grid transmit microwave radiation both inside the home and throughout the neighborhood when they send signals, but smart meters also have now created dirty electricity throughout the home and the entire grid (meaning outside the home as well), due to dirty electricity created through high frequency transients being on all power and electricity lines that contain smart grid transmissions.

This is of course in direct violation of federal rules and regulations for accepting federal funds, all recipients of which must adhere to ADA rules and regulations.

IEQ Indoor Environmental Quality Project

http://www.access-board.gov/research/completed-research/indoor-environmental-quality/introduction

"The Board recognizes that multiple chemical sensitivities and **electromagnetic sensitivities may be considered disabilities under the ADA** if they so severely impair the neurological, respiratory or other functions of an individual that it substantially limits one or more of the individual's major life activities.

Not only does smart grid violate ADA with indoor electromagnetic pollution, but also outdoor being as smart grid BLANKETS entire neighborhoods, cities and even states with uninterrupted RF signals, leaving no area RF free and therefore prohibiting access to many public areas for those with electrosensitivity.

These codes have been on the books for decades. These are associated with the health impact of smart meters:

- **ICD 9 E925.01 Non-Lethal Current/Induction from contract or from transients**
- **ICD 9 E926.0 Radio Frequency Radiation**
- **ICD 9 995.94 Systemic Inflammatory Response Syndrome due to non-infectious process**

National Institute of Buildings and Sciences Indoor Environmental Quality Report:

http://web.archive.org/web/20060714175343/ieq.nibs.org/ieq_project.pdf

Electromagnetic Fields

"…the presence of EMF is an access barrier for people who are electromagnetically sensitive. Therefore, the Committee recommends that measures be taken to reduce EMF whenever possible in order to increase access for these individuals as well as taking a precautionary approach to protecting the health of all."

"For people who are **electromagnetically sensitive**, the presence of cell phones and towers, portable telephones, computers, fluorescent lighting, unshielded transformers and wiring,

battery re-chargers, wireless devices, security and scanning equipment, microwave ovens, electric ranges and numerous other electrical appliances **can make a building inaccessible**."

"The National Institute for Occupational Safety and Health (NIOSH) notes that scientific studies have raised questions about the possible health effects of EMF's. NIOSH recommends the following measures for those wanting to reduce EMF exposure – **informing workers and employers about possible hazards of magnetic fields, increasing workers' distance from EMF sources, using low-EMF designs wherever possible (e.g., for layout of office power supplies), and reducing EMF exposure times** (11)."

16) UBIQUITOUS DIRTY ELECTRICITY CREATED THROUGH SMART METER/SMART GRID SWITCHING MODE POWER SUPPLY AND PULSED RADIATION MORE HARMFUL THAN CONTINUOUS

The SWPS or Switching Mode Power Supply in all smart meters and smart grids, create ubiquitous dirty electricity ***THROUGHOUT ENTIRE NEIGHBORHOODS EVEN WHEN ELECTRICITY IS SHUT OFF IN THE HOME****. Thus there* ***is no escaping the exposure to this KNOWN CARCINOGEN*** *in addition to making opting out of smart meters for health reasons an exercise in futility.*

Health Impacts of Radio Frequency from Smart Meters

Dr. Sam Milham's Critique of CCST's report:

http://sagereports.com/smart-meter-rf/?p=323

"Smart meters transmit their data via radio frequency (RF) either through the air or on utility wiring. The electronics of all transmitters operate on direct current (DC), which is obtained using inverters and switching power supplies in the meter which interrupt the grid AC current flow and generate dirty electricity which flows back to the grid on the 60 Hz AC throughout the substation service area. Interrupting current flow generates dirty electricity."

"…the utilities got off the hook by instead of beefing up their neutrals, they simply tied the neutrals to the earth so that now, about 70% of the electricity delivered from the substation, returns there via the ground. **The California PUC rule 33.2 forbids using the earth for return currents, but this didn't stop PG and E or Edison from running wires**

down every other power pole connecting the neutral to the earth. Here is the PUC rule:"

General Order 95
Section III
Requirements for All Lines
33.2 Ground or Earth as a Conductor

"Ground or earth shall not be used as a normal return or circuit conductor. In direct current supply systems or in single phase or polyphase supply systems, a neutral or any other conductor shall be used under normal use as a return or circuit conductor; however, **the grounding of the neutral or any other conductor is not permitted as a normal return or circuit conductor.** The neutral or any other conductor is permitted to be grounded only for the purposes of stabilization and protection."

"Violation of this rule has created health problems in farm animals and families and dirty electricity gets into our homes and offices and schools via ground rods and electrically conductive plumbing. I have measured higher EMFs in homes with the electrical service turned off due to unbalanced current flow."

"In the last few weeks, I have been contacted by two electrohypersensitive California women, both of whom had to move out of their homes because of illness as smart meters were being introduced into their neighborhoods, before smart meters were attached to their homes. A third east coast woman sent me an oscilloscope wave form obtained in her home with the electrical service turned off and no smart meter on her house. The neighborhood had smart meters deployed, which used utility wiring to submit information to the substation. The frequency of the wave form was exactly that used to transmit smart meter information."

"…in all three cases, the damaging signal was dirty electricity in the wiring and the ground currents coming from the deployed meters."

"I'm not making light of or ignoring the RF pollution caused by the smart meters, but think the dirty electricity may be a more serious and intractable problem."

New Critical Problem with Smart Meters: The Switching Mode Power Supply

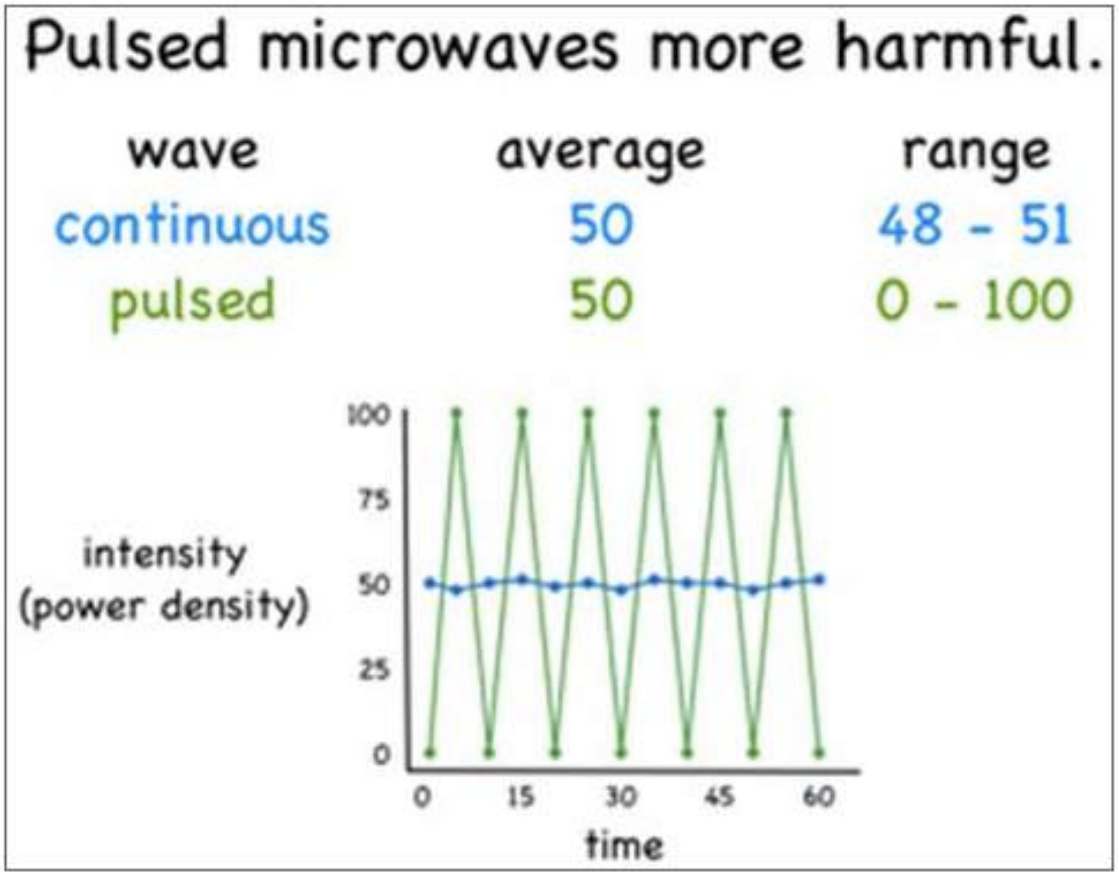
http://eon3emfblog.net/?p=2180

“It is well known that switching power supplies can generate spikes of so-called electromagnetic interference (EMI), or high frequency transients, which then travel along the wiring in the walls, radiating outward in the wiring’s electromagnetic field.”

“The SMPS function emits sharp spikes of millisecond bursts constantly, 24/7. The SMPS on the OWS 514 NIC model, for instance, which is the smart meter model widely installed by PG&E throughout its territory, has been measured to emit spikes of up to 50,000 Hz and higher. This constant pulsing of high frequencies, in addition to the RF function, is causing not only interference with other electric and electronic equipment in many homes with smart meters installed, but also is causing havoc with biological systems in its field of exposure.”

PULSED RADIATION MORE HARMFUL THAN CONTINUOUS

Smart meters emit intense millisecond bursts of pulsed radiation as opposed to continuous. Used radiation is much more harmful to biology.



Finally Experts Admit Cellphones Are A Carcinogen

http://articles.mercola.com/sites/articles/archive/2011/06/18/finally-experts-admit-cellphones-are-a-carcinogen.aspx

Magda Havas, PhD of Trent University, Canada, agrees pulsed radiation is more dangerous:

"Pulsed radiation is much more harmful and the true intensity is not provided as it is "averaged" during a period of time (30 minutes for public exposure in US). The average of the pulse (maximum reading) and the minimum reading
gives a false low reading. Engineers like to measure averages but living organisms react to extremes so these average readings under estimate the potential for harm if the radiation is pulsed."

17) SMART METERS AND SMART GRID VIOLATE FCC RULES AND REGULATIONS ON INTERFERENCE

Power Utility Smart Meters Causing Router Interference, Maine Public Advocate Says Users Not Being Educated

https://secure.dslreports.com/shownews/Power-Utility-Smart-Meters-Causing-Router-Interference-117120

"If some appliances, computers or communications equipment have been working oddly lately, the Maine Public Advocate's office said your electric meter may be to blame…The office put out a statement this week saying Central Maine Power Co.'s **"smart meters" -- which use low-power radio frequency transmissions to send meter readings to the company -- are interfering with a wide range of household electronic devices, from garage door openers and WiFi devices to security systems."**

Readers: Smart Meters Interfere with Baby Monitors and Other Household Gadgets

http://www.mercurynews.com/top-stories/ci_16007725

"Cordless phones and crib monitors, patio speakers and wireless headsets are spitting out static and startling pops and crackles, they complained**. Also affected,**

they said, are wireless microphones, security systems, motion detectors and remotely controlled garage doors." "Right about the time that SmartMeters were installed, our phone went insane," wrote Jane Meckman of San Jose.
"When Action Line asked PG&E about the complaints, the utility said little and put up a bureaucratic hurdle to get responses to readers' concerns, going so far as to require notarized waivers of confidentiality. That's the definition of stonewalling."

Many people are experiencing interference with their radio stations, WIFI connections (not that we condone WIFI we don't) and other RF interference problems since smart meter installation and smart grid roll out. This interference is in violations of FCC rules and regulations.

Understanding the FCC Regulations for Computers and Other Digital Devices

http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet62/oet62rev.pdf

FCC technical standards state there is not supposed to be any interference with authorized radio-frequency devices. Yet smart meters are ubiquitously interfering with MANY electrical devices, including MEDICAL.

Section 15.5. OET Bulletin 62.

"Digital devices that are exempt from the technical standards in Part 15 are still not permitted to cause harmful interference to any authorized radio communications."

18) SMART GRID AND SMART METERS VIOLATE THE ALREADY UN-PROTECTIVE FCC STANDARDS

Although the FCC "safety" standards for RF microwave radiation are already un-protective, the collocation of smart meters and smart grid actually violates these un-protective and health damaging "safety" standards. Additionally, placement of many smart meters violate orders to keep 20 centimeters (approx. 8 inches) away from the meters.

The FCC Grants of Equipment Authorization, which govern the rules upon which FCC compliance is based, warns that RF exposure compliance depends on specific conditions. The conditions include one or more of the following, depending on the specific make and model of Smart Meter.

- limited single module approval requires professional installation;
- **antenna(s) must provide a separation distance of at least 20 cm from all persons;**
- **antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter;**
- **end-users and installers must be provided with antenna installation and transmitter operating conditions for satisfying RF exposure compliance**

"Smart Meters are often co-located in banks of multiple meters. Co-location also occurs within Smart Meters because electric Smart Meters include at least two internal RF antennas. *One antenna is used for the mesh network system and the other is for the Home Area Network (HAN) systems. Antennas are designed to work in conjunction with the HAN and RF appliances and with other Smart Meters in a mesh network. Antennas have separate Grants of Equipment Authorization, which suggests that manufacturers have tested antennas in isolation and individually, and not in combination, which is how the Smart Meter and the Smart Grid system were designed to operate…."*

EMF Safety Network, A. 10-04-018, Declaration p, 1. Jan. 5, 2011

http://emfsafetynetwork.org/emf-safety-network-legal-work/

"…Network alleges one or more FCC exposure compliance violations for the following meters PG&E is deploying: FCC ID numbers: OWS-NIC514, OWS-NIC507, and LLB6327PWM."

"Furthermore, "antenna(s) must provide a separation distance of at least 20 cm (8 in.) from all persons," yet there are no warning labels on Smart Meters, and PG&E has actually encouraged people to get close to their meters to read them."

"Many Smart Meters are installed within 20 cm of public access. In some cases the meters are installed inside homes and businesses. In many situations Smart Meters are easily accessible to the public. This rule is clearly violated."

photograph courtesy Amy O'Hair

FCC compliance violations are likely to occur under normal conditions of installation and operation of smart meters and collector meters.

Assessment of Radiofrequency Microwave Radiation Emissions From Smart Meters

http://sagereports.com/smart-meter-rf/

"The emissions from one meter are strong enough that the public is put at risk from exposures outward from the meter from approximately one foot to over six feet, depending on the reflection factor," says Cindy Sage, Sage Associates. "For multiple meters at the same location, the zone of impact where FCC limits may be violated is somewhere between three feet and 19 feet, depending on the reflection factor."

Assessment of Radiofrequency Microwave Radiation Emissions from Silver Springs OWS-NIC514 Model Wireless Electric Meter

http://sagereports.com/smart-meter-rf/?page_id=429

"Violations of FCC safety limits for uncontrolled public access are identified at distances out to a distance of more than one foot for a single meter, and several feet for multiple meters, even under the most restrictive FCC formula using only a 60% reflection factor."

Smart Grid and Smart Meters Exceed the Already Dangerously Inadequate FCC Health and Safety Guidelines

http://sagereports.com/smart-meter-rf/
http://sagereports.com/smart-meter-rf/docs/Smart-Meter_Report.B-Tables.pdf
http://sagereports.com/smart-meter-rf/docs/Smart-Meter_A-Tables2.pdf

"In addition to exceeding FCC public safety limits under some conditions of installation and operation, smart meters can produce excessively elevated RF exposures, depending on where they are installed."

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

No Baseline RF Assessment

"**Smart meter and collector meter installation are taking place in an information vacuum. FCC compliance testing takes place in an environment free of other sources of RF, quite unlike typical urban and some rural environments.** There is no assessment of baseline RF conditions already present (from AM, FM, television and wireless communication facilities (cell towers), emergency and dispatch wireless, ham radio and other involuntary RF sources. Countless properties already have elevated RF exposures from sources outside their own control."

"Consumers who for whatever reason have already eliminated all possible wireless exposures from their property and lives, may now face excessively high RF exposures in their homes from 7 smart meters on a 24-hour basis."

"People who are afforded special protection under the federal Americans with Disabilities Act are not sufficiently acknowledged nor protected."

"People who have medical and/or metal implants or other conditions rendering them

vulnerable to health risks at lower levels than FCC RF limits may be particularly at risk (Tables 30-31)."

"This is also likely to hold true for other subgroups, like children and people who are ill or taking medications, or are elderly, for they have different reactions to pulsed RF."

"Children's' tissues absorb RF differently and can absorb more RF than adults (Christ et al, 2010; Wiart et al, 2008). **The elderly and those on some medications respond more acutely to some RF exposures."**

"Safety standards for peak exposure limits to radiofrequency have not been developed to take into account the particular sensitivity of the eyes, testes and other ball shaped organs."

"In summary, no positive assertion of safety can be made by the FCC, nor relied upon by the CPUC, with respect to pulsed RF when exposures are chronic and occur in the general population. Indiscriminate exposure to environmentally ubiquitous pulsed RF from the rollout of millions of new RF sources (smart meters) will mean far greater general population exposures, and potential health consequences."

RF Exposure from mobile phone base stations

Worldwide Limits and Guidelines (in microwatts per sq. meter -$\mu W/m^2$

Prepared by Peter Schlegel, www.buergerwelle-schweiz.org based on a list published in "Warum Grenzwerte schädigen, nicht schützen [Why exposure limits are not protective, but harmful]" by the Competence Initiative www.broschuerenreihe.net/international/index.html (September 28, 2009). Printed here with permission.

100000000	US Army, Navy, and Air Force; Bell Telephone; General Electric Company (1957/58) "Microwave Conference", USA 1955 [Brodeur, 1980]
10,000,000 to 4,500,000	USA, Canada, UK, Germany, Sweden, Finland, Japan, Austria, and many others. Switzerland total sum of RF at any place. Limit values depending on carrier frequency. ICES; ICNIRP: derived from biological effects of short-term, high-level exposures causing a rise in temperature
2000000	Australia and NZ for GSM 900
1200000	Belgium without Wallonia Law (2001)
1161000	Italy, sum total of RF at any place
1000000	Former GDR, exposure ≤ 2 hours - OHS Regulation:TGL 22314 (1969)
100000	Former GDR, exposure ≤ 20 hours - OHS Regulation:TGL 22314 (1969)
100000	Former Soviet Union , mid-20th century
100000	Italy, exposure > 4 hours
100,000 to 42,500	Switzerland, indoor exposure level from one transmitter site[1]. Limit values depending on carrier frequency. [1]A transmitter site may consist of one or more mobile phone base stations, its perimeter (ca. 40-100 m) depends on the radiated power of the particular adjacent base stations. Ordinance (2000) (Decision of Swiss Federal High Court, 30 Aug 2000)
24000	Law (2007 and 2009)
1000	Lichtenstein: indoor exposure level from one transmitting site; implementation by end of 2012 - Law and Ordinance (2009)
1000	France, testing period decided by 60 cities - (Sep 2009)
1000	Salzburg Resolution (1998), sum total of GSM
100	European Parliament, STOA Report - (2001)
100	BUND, prevention of hazards BUND – German Alliance for Environmental and Nature Protection (2008)
1	BUND, precautionary principle
1	Salzburg Precautionary Value, indoor exposure level for sum total of GSM - (2002)
< 0.1	***Building Biology Evaluation Guidelines*** (SBM 2008) specifically designed for sleeping areas and empirically established on the basis of many thousands of individual cases, including EHS sufferers. Generally adopted by all Building Biology environmental consultants who conduct professional RF surveys in homes, at workplaces, for EHS sufferers.

http://sagereports.com/smart-meter-rf/?p=328

"Guidelines in Russia, Switzerland, Poland, and China are well below the FCC standard (i.e. 10 vs. 1000 microW/cm2 or 1% of FCC guidelines). Some military and government insiders tried to get U.S. guidelines reduced decades ago but were not successful (Pollack and Healer 1967, Dodge 1969). "

Citizens and consumers, should be able to choose how much RF radiation we are exposed to. With smart grid, smart meters and smart appliances, we are having that choice about our own health stolen from us.

19) SMART GRID AND SMART METERS VIOLATE ENVIRONMENTAL LAWS, THREATENS ENDANGERED SPECIES, ECOSYSTEMS, ANIMALS AND NATURAL HABITAT

RISK TO FEDERALLY LISTED ENDANGERED SPECIES

Many wetlands and coastal areas are home to many endangered species. For instance, Topanga, CA is home to the Steelhead Trout and Topanga State Park is home to the Horned Lizard, also an endangered species. It is also home to many federally protected Oak trees. There is a 5 mile stretch from these precious coastal areas that need protection.

Under federal law, endangered species are protected from cell tower radiation and may be used as reason to reject applications and permits for cell towers. Smart grid and smart meters are no different and must be considered regarding environmental impact on endangered species.

United States Department of the Interior

http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf

The second significant issue associated with communication towers involves impacts from non-ionizing electromagnetic radiation emitted by these structures. Radiation studies at cellular communication towers were begun circa 2000 in Europe and continue today on wild nesting birds. Study results have documented nest and site abandonment, plumage deterioration, locomotion problems, reduced survivorship, and death (*e.g.*, Balmori 2005, Balmori and Hallberg 2007, and Everaert and Bauwens 2007). Nesting migratory birds and their offspring have apparently been affected by the radiation from cellular phone towers in the 900 and 1800 MHz frequency ranges – 915 MHz is the standard cellular phone frequency used in the United States. However, the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today. This is primarily due to the lower levels of radiation output from microwave-powered communication devices such as cellular telephones and other sources of point-to-point communications; levels typically lower than from microwave ovens. The problem, however, appears to focus on very low levels of non-ionizing electromagnetic radiation. For example, in laboratory studies, T. Litovitz (personal communication) and DiCarlo *et al.* (2002) raised concerns about impacts of low-level, non-thermal electromagnetic radiation from the standard 915 MHz cell phone frequency on domestic chicken embryos – with some lethal results (Manville 2009, 2013a). Radiation at extremely low levels (0.0001 the level emitted by the average digital cellular telephone) caused heart attacks and the deaths of some chicken embryos subjected to hypoxic conditions in the laboratory while controls subjected to hypoxia were unaffected (DiCarlo *et al.* 2002). To date, no independent, third-party field studies have been conducted in North America on impacts of tower electromagnetic radiation on migratory birds. With the European field and U.S. laboratory evidence already available,

independent, third-party peer-reviewed studies need to be conducted in the U.S. to begin examing the effects from radiation on migratory birds and other trust species.

Here are some studies on animals and echo systems:

Electromagnetic pollution from phone masts. Effects on wildlife.

http://www.ncbi.nlm.nih.gov/pubmed/19264463

"A review on the impact of radiofrequency radiation from wireless telecommunications on wildlife is presented. Electromagnetic radiation is a form of environmental pollution which may hurt wildlife. **Phone masts located in their living areas are irradiating continuously some species that could suffer long-term effects, like reduction of their natural defenses, deterioration of their health, problems in reproduction and reduction of their useful territory through habitat deterioration. Electromagnetic radiation can exert an aversive behavioral response in rats, bats and birds such as sparrows. Therefore microwave and radiofrequency pollution constitutes a potential cause for the decline of animal populations and deterioration of health of plants living near phone masts.** To measure these effects urgent specific studies are necessary."

Mobile phone mast effects on common frog (Rana temporaria) tadpoles: the city turned into a laboratory.

90% of tadpoles died when exposed to cell phone antennas at a distance of 140 meters (approx. 450 feet) from the antennas located on top of a nearby city roof.

http://www.ncbi.nlm.nih.gov/pubmed/20560769

Abstract

An experiment has been made exposing eggs and tadpoles of the common frog (Rana temporaria) to electromagnetic radiation from several mobile (cell) phone antennae located at a distance of 140 meters. The experiment lasted two months, from the egg phase until an advanced phase of tadpole prior to metamorphosis. Measurements of electric field intensity (radiofrequencies and microwaves) in V/m obtained with three different devices were 1.8 to 3.5 V/m. In the exposed group (n = 70), (**number of tadpoles in the experiment was 70)** low coordination of movements, an asynchronous **(not in synchronicity; tadpoles were growing at radically different rates from one another. Tadpoles usually grow at the same rates) growth, resulting in both big and small tadpoles, and a high mortality (90%) was observed.** Regarding the control group (n = 70) under the same conditions but inside a Faraday cage **(metal cage that screens out radio waves),** the coordination of movements was normal, the development was synchronous, **(all grew together at same rate)** and a mortality of 4.2% was obtained. These results indicate that radiation emitted by phone masts in a real situation may affect the development and may cause an increase in mortality of exposed tadpoles. This research **may have huge implications for the natural world**, which is now exposed to high microwave radiation levels from a multitude of phone masts.

CHAPTER 3 COASTAL RESOURCES PLANNING AND MANAGEMENT POLICIES

Section 30240(b) of the CA Coastal Act states:

http://www.coastal.ca.gov/fedcd/cach3.pdf

"Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas **shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas."**

Yet smart grid has been deployed with ZERO environmental impact reports or consideration of these endangered species or the Endangered Species Act, which will undoubtedly

negatively impact these species by completely blanketing sensitive areas in pulsed microwave smart grid radiation.

Impacts of radio-frequency electromagnetic field (RF-EMF) from cell phone towers and wireless devices on biosystem and ecosystem – a review

http://www.omicsonline.com/open-access/0974-8369/0974-8369-4-179.pdf?aid=12830

BMID: BM-8 p209
"The most affected of the species are bees, birds, and bats and without these pollinators visiting flowers, 33% of fruits and vegetables would not exist, and as the number of pollinators decline, the agricultural crops will fall short and the price of groceries will go up (Kevan and Phillips, 2001)."

Studies on Plants (p206)
"Tops of trees tend to dry up when they directly face the cell tower antennas and they seem to be most vulnerable if they have their roots close to the water (Belyavskaya, 2004). (snip) According to Levitt (2010), trees, algae, and other vegetation may also be affected by RF-EMF."

Studies on Insects (p206-7)
"Colony collapse disorder (CCD) was observed in beehives exposed to 900 MHz for 10 minutes, with sudden disappearance of a hive's inhabitants, leaving only queen, eggs, and a few immature workers behind. With navigational skills affected, worker bees stopped coming to the hives after 10 days and egg production in queen bees dropped drastically to 100 eggs/ day compared to 350 eggs. (Sharma and Kumar, 2010)"

"Studies performed in Europe documented navigational disorientation, lower honey production, and decreased bee survivorship (Kimmel *et al.*, 2007)."

"A study by the University of Athens on fruit flies exposed to 6 minutes of 900 MHz pulsed radiation for 5 days showed reduction in reproductive capacity (Panagopoulos *et al.*, 2004)."

Studies on Amphibians and Reptiles (p207)
"Salamanders and turtles have navigational abilities based on magnetic sensing as well as smell. Many species of frogs have disappeared all over the world in the last 3–5 years. Amphibians can be especially sensitive because their skin is always moist, and they live close to, or in water, which conducts electricity easily (Hotary and Robinson, 1994)"

"Toads when exposed to 1425 MHz at a power density of 0.6 mW/cm2 developed arrhythmia (Levitina, 1966)."

"In a two-month study in Spain in common frog tadpoles on the effects of mobile phone mast located at a distance of 140 m noted low coordination of movements, an asynchronous growth, resulting in both big and small tadpoles, and a high mortality (90%) in exposed group. For the unexposed group in Faraday cage, the coordination of movements was normal, the development was synchronous, and a mortality of 4.2% was obtained (Balmori, 2009)"

Studies on Birds (p207-208)

"Tower-emitted microwave radiation affected bird breeding, nesting, and roosting in Valladolid, Spain (US Fish & Wildlife Service, 2009)."

"In chick embryos exposed to ELF pulsed EMR, a potent teratogenic effect was observed, leading to microphthalmia, abnormal trunkal torsion, and malformations on the neural tube (Lahijani and Ghafoori, 2000)."

"Evidence of a connection between sparrow decline in UK and the introduction of phone mast GSM was established (Balmori, 2009)."

"Deformities and deaths were noted in the domestic chicken embryos subjected to low-level, non-thermal radiation from the standard 915 MHz cell phone. frequency under laboratory conditions (US Fish & Wildlife Service, 2009)."

Studies on Mammals (p208)

"In a study on cows and calves on the effects of exposure from mobile phone base stations, it was noted that 32% of calves developed nuclear cataracts, 3.6% severely. Oxidative stress was increased in the eyes with cataracts, and there was an association between oxidative stress and the distance to the nearest mast (Hässig *et al.*, 2009)."

"Death in domestic animals like hamsters and guinea pigs were noted (Balmori, 2003). Bats use electromagnetic sensors in different frequencies. Since 1998, a study on a free-tailed bat colony, having *Tadarida teniotis* and *Pipistrellus pipistrellus* has been carried out in Spain and a decrease in number of bats were noted with several phone masts 80 m from the colony. A dead specimen of *Myotis myotis* was found near a small antenna in the city centre (Balmori, 2009)."

VIOLATION OF COASTAL ACCESS PROVISION SECTION 30252 AND ADA

Any decision made by a local or state government that restricts access granted to, or mobility of a class of citizens because of a medical condition or disability is a violation of the Americans with Disabilities Act, and of Coastal Access provisions in section 30252 of the Coastal Act:

"New development should maintain and enhance public access to the coast."

Electrosensitivity has also been documented in peer-reviewed, published scientific studies, is acknowledged as a disability and functional impairment in many countries and is recognized as a disability under the ADA in the US.

Lack of access resulting from adverse health consequences of wireless technology is subject to the rules and regulations of the Americans with Disabilities Act. Yet citizens who currently enjoy access to this area of states that have smart grid are essentially being denied access to these areas and even their own neighborhoods including their own homes!!

20) RAPID, DELETERIOUS AND COSTLY IMPACT ON BUILDING STRUCTURAL INTEGRITY

Curtis Bennett, Thermographix Consulting Corporation, warns about the "molecular earthquakes" and fire separation hazard from Smart Meters and other wireless devices that threaten building integrity.

Letter to Energy Minister, Government of British Columbia, March 7, 2012 Radio Frequencies Compromising Buildings, Fire Separations, Electrical Systems, Fire Safety, Infrastructure, etc.

www.thermoguy.com/urbanheat.html

Building Code and Fire Separations

"Blanketing areas with frequencies for ease of communication has serious ramifications on buildings and infrastructure that requires immediate attention. (British Columbia) Building Code and Part 4 don't want buildings subjected to molecular earthquakes. If you aggressively vibrate or electromagnetically induce everything, engineers, education, fire services and professionals at many levels have to be informed. You will have catastrophic failures with a domino effect at several levels…."

"Natural EMFs like solar radiation are so important and impactful, it is addressed in building codes…."

"We wire and construct building development as well as infrastructure to keep people safe from EMFs. We run cables instead of single conductors so the 60 Hz EMFs from each conductor cancel each other out. When we don't, the expanding and collapsing EMFs from singular wires would impact anything they interact with…"

“Frequencies blasting across the atmosphere to communicate with smart devices will interact with all infrastructure including industry. Electromagnetic induction and high speed vibrations penetrating concrete isn’t our objective. Whether smart meters on buildings or Wi-Fi in schools, frequencies are going through walls and structures. Towers, collectors or wireless infrastructure is communicating with meters and meter banks. The frequencies are blasting buildings, everything on the way there and going through structural components as well as fire separations. **900 MHz [electric Smart Meters] going through walls is going to cause molecules of construction material to change direction 1.8 billion times per second. 2.4 GHz [HAN frequencies] or 5 GHz in schools means 4.8 or 10 billion times per second…Smart meters and smart grid add a dangerously powerful level of microwave emissions to the already microwave stressed and fatigues building infrastructure.”**

“Design Professionals including professional engineers, fire services have to be informed when a structure will be vibrated billions of times per second. Buildings subjected to frequencies have to be designed for it I.e. RF Engineer from Norad reported their buildings had grounded copper mesh to address the potential charge from frequencies.”

“Engineers, municipalities, building inspection, etc. can’t rule out the building’s structure and fire separations compromised as a result of frequency interaction. Multiple smart devices under more load will increase the intensity of the molecular earthquakes caused to structures, fire separations, electrical systems, etc. Meter banks on high-rises are in the basement or on the ground floor and vibrating the structure holding up the high-rise.”

“Professionals signing off on buildings, municipalities, developers, fire services, insurers and banks haven’t been informed the function of their building has changed, as would liability. It brings complex liabilities forward which require clarification from the authorities having jurisdiction…every minute of this subtle radiation compounds problems.”

“We design fire separations to contain a fire and fire rated drywall changing direction 1.8 to 10 billion times **per second** with frequency exposure is going to impact fire separation integrity and perceived safety of fire fighters.”

“Wi-Fi, smart meters and cellphones are determined to be low emissions devices that can be used 24/7. At billions of times per second, 24 hours per day and 7 days a week, how much can a structure or fire separation take before the building isn’t safe?”

Although cell phones, WIFI and cell towers stress and fatigue structural integrity of buildings, smart meters and smart grid actually ride in on the wiring of the building, now stressing it from the inside out. This is bound to have significant deleterious effects on the building in possibly ways we have not seen yet with regard to cell tower, WIFI and other radiation stress.

21) FIRE HAZARD CAUSED BY SMART METERS

There are many reasons why smart meters are known to cause fires in homes. One of the very basic ones is simply that the meters are too big to fit into the boxes that previously housed the analog meters. But installers (who are rarely licensed electricians) just jam them in anyway because they are in most cases paid per meter, just as the electric companies are only paid if they hit a certain level of smart meter roll out saturation in their service area.

However, there are also other reasons why smart meters start fires, having to do with electrical wiring incompatibility with the technology.

Besides entire houses burning down and smaller house fires, there have been many instances of "fried appliances", electrical wire arcing, burned outlets, exploding meters, overheating meters, burning meters and of course interference with AFCIs (arc fault interrupters) and GFCIs (ground fault circuit interrupters).

Wireless Smart Meters and Potential For Electrical Fire

http://eon3emfblog.net/wp-content/uploads/2010/09/Wireless-Smart-Meters-and-Potential-for-Electrical-Fires.pdf

"Typical gauge electrical wiring that provides electricity to buildings (60 Hz power) is not constructed or intended to carry high frequency harmonics that are increasingly present on normal electrical wiring…
The use of smart meters will place an entirely new and significantly increased burden on existing electrical wiring because of the very short, very high intensity wireless emissions (radio frequency bursts) that the meters produce to signal the utility about energy usage… "

"Reports detail that the meters themselves can smoke, smolder and catch fire, they can explode, or they can simply create over-current conditions on the electrical circuits… "

"Electrical wiring was never intended to carry this - what amounts to an RF pollutant - on the wiring. The higher the frequency, the greater the energy contained."

"Faulty wiring, faulty grounding or over-burdened electrical wiring may be unable to take the additional energy load."

PG@E Whistle Blower "PG@E knows smart metes cause fires and they are covering it up."

http://www.youtube.com/watch?feature=player_embedded&v=EnxIoItNUek

Man Dies in Smart Meter Fire – PG@E Settles Out of Court But Continues Proliferating Deadly Smart Meter Installations

http://stopsmartmeters.org/2013/06/21/when-smart-meters-kill-the-story-of-larry-nikkel-details-emerge-of-vacaville-ca-smart-meter-fire-death/

Lawsuit of Defects of Sensus Smart Meters

http://www.smartenergyuniverse.com/ami/4621-lawsuit-on-defects-of-sensus-smart-meters

"A lawsuit has been filed by Don Baker, former employee of Sensus, a smart meter manufacturer."

"The suit states: "Mr. Baker has direct personal knowledge that Sensus and Southern Company [the utility] have installed approximately one million iConA meters in Alabama homes with knowledge that the meters are seriously defective and pose a substantial fire hazard and that at least two Alabama homes have burned as a result."

Florida TV News – Smart Meter Sparks Fire

http://www.wfla.com/story/23278891/lakeland-fire-sparks-concerns-about-smart-meters

Livonia fire officials - DTE Energy Investigates Home Blaze

http://www.detroitnews.com/article/20131025/METRO01/310250117

Smart Meters Cause Fires Amongst Other Life Threatening Problems - Australia

http://www.youtube.com/watch?feature=player_embedded&v=4e71qAr_qGk

Smart Meters Spark Controversy

http://www.myfoxdc.com/story/22240644/fox-5-investigates-smart-meters-spark-controversy#ixzz2TIPxfMlI

Is Your Electric Meter Dangerous?

http://www.wxyz.com/dpp/news/is-your-electric-meter-dangerous

Smart Meter Explosion in Detroit and Across Country

http://spectrum.ieee.org/energywise/energy/the-smarter-grid/smart-meter-fire-reports

"Obviously all companies with smart meter programs, and all their suppliers and sub-contractors, are going to have to take a close look at the issue of fire hazards."

"We are seeing a spate of report from around the United States—and indeed around the world—of fires believed to have been caused by smart meters that were faulty, incorrectly installed, or connected to circuits where there were unfortunate and unforeseen effects. This appears to be not just a matter of freak incidents that may or may not have taken place here or there. "

"In some cases fires appear to have originated in the meters themselves, in other cases in appliances like microwave ovens or refrigerators (as in the photo above), because of power surges."

"…just last week Commonwealth Edison of Illinois confirmed three smart meter fires in its operating area, and earlier last month its sibling company Peco Energy suspended smart meter installations in the Mid-Atlantic states after 15 reports of smart meter fires, one in Philadelphia.
This is just the beginning of a difficult story…"

Power Surge Raises Questions About Smart Meter Safety

http://www.paloaltoonline.com/news/show_story.php?id=22378

"Katz said the advantage of the analog meter is that it doesn't have internal electronics. When a power surge hits a digital meter, the extra jolt of electricity can disrupt the flow of data or even shut down the meter, she said."

"…"In the collective memory of TURN, we have not seen similar incidents with analog meters," (Mindy Spatt of TURN) said."

Fires Linked to Smart Meters?

http://www.3aw.com.au/blogs/breaking-news-blog/fires-linked-to-smart-meters/20111107-1n2jz.html

The Australian Metropolitan Fire Brigade launched an official investigation into fires, linked to Smart Meters (November 2011). They ordered **"all firefighters to report fires, where smart meters are present and has advised officers not to allow power companies to take the meters from the scene."**

Electrical Trades Union again calls for suspension of smart meter rollout

http://www.heraldsun.com.au/news/more-news/smart-meter-death-fears/story-fn7x8me2-1226285463342

"The state's electrical union fears someone will have to die before safety concerns about controversial smart meters are addressed."

New Zealand

Fire Prone Meter Boxes Causing Concern

http://www.3news.co.nz/Fire-prone-meter-boxes-causing-concern/tabid/423/articleID/159133/Default.aspx#.UpWWco0kNFU

"Front line firefighters are concerned about the number of household power meter boxes that are bursting into flames. "

"There have been 67 callouts in Christchurch to electrical malfunctions so far this year, and new smart meters have been involved in three in the last five days."

"Graham Hobbs considers himself lucky. He was woken at 4:30am to find his smart meter on fire."

"I lifted this up it was still glowing and smoking, and slammed it shut to try and seal it off."

“The following night Kelvin Dixon, who lives nearby, suffered a similar fate.“

"I pulled into my drive way and found my meter box on fire great amounts of smoke."

“Mr. Dixon is a registered electrician and says the contractor that sits beneath the smart meter caught fire and melted.”

"I have suspicions that maybe the installation the terminals weren't tightened enough."

"It was very dangerous," says station officer Murray Jamieson. "The whole thing burnt out completely, last night's one was a melt down and it was significantly dangerous."

Fire captain finds hazardous power surges follow Smart Meter installations

http://emfsafetynetwork.org/?p=9013

“A **California Fire Captain came forward to detail how his household electronics malfunctioned repeatedly and two surge protectors melted down after two different Smart Meter installations.”**

*Although **THOUSANDS** of these stories exist, please see the below link **for hundreds of smart meter/fire stories.***

http://emfsafetynetwork.org/smart-meters/smart-meter-fires-and-explosions/

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22) FALSE AND MISLEADING CLAIMS OF SAFETY OF MICROWAVE RADIATION AS EMITTED BY SMART GRID AND SMART METERS

When customers call their utilities with complaints of health effects they are attributing to the smart meters, they are consistently LIED TO by the utilities regarding even the possibility of health effects from smart meters or smart grid.

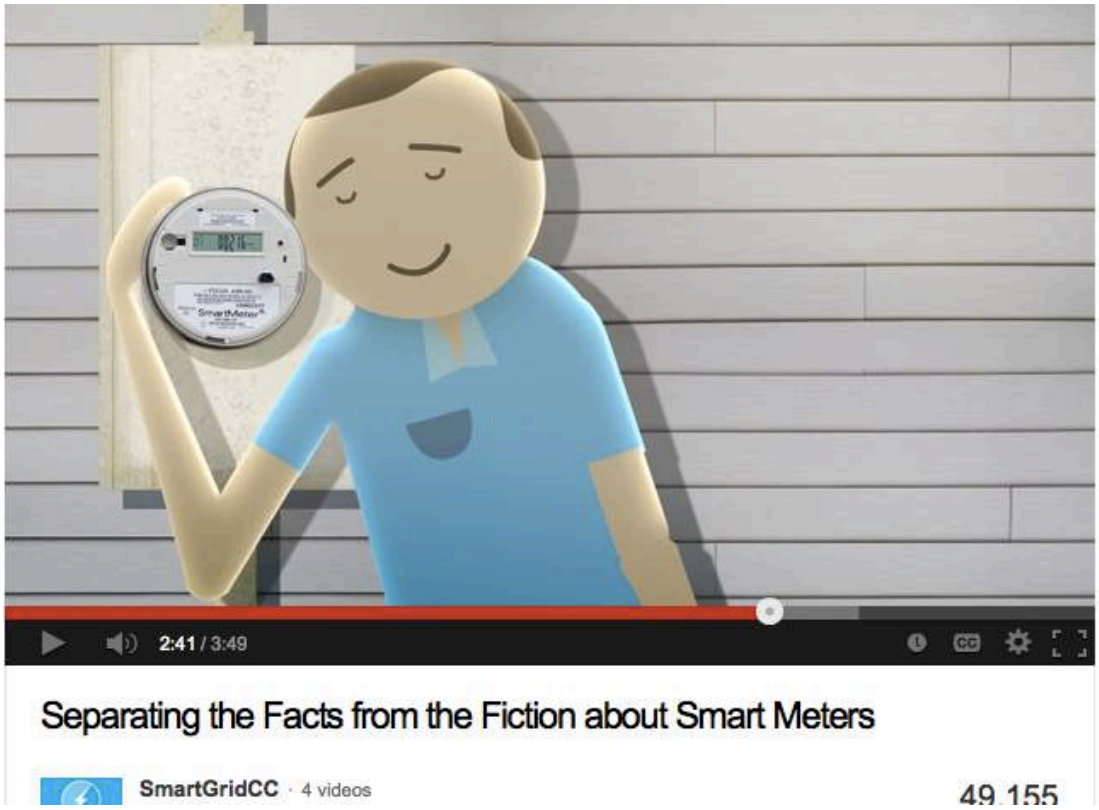
The Problems With Smart Grids

http://www.counterpunch.org/2011/03/18/the-problems-with-smart-grids/

"Utilities don't release numbers for peak pulses, but one estimate by Southern California Edison – since voided for P.R. reasons – **puts peak pulses at 229,000 microwatts per square centimeter at eight inches from the transmitter**. That means if you sleep next to a wall with a smart appliance on the other side, strong UHF signals could be spiking several times a minute all night long – right into your brain."

The Truth About Smart Meters

http://www.youtube.com/watch?v=Nij-_gAMj-4&feature=youtu.be



The above picture, picture and accompanying video was produced by SGCC, Smart Grid Consumer Collaborative, (pretty much a 100% industry organization despite the name) clearly misleads the consumers into thinking getting this close to a smart meter is actually

okay to do. All smart meters clearly state not to get within 20 cm (approx. 8 inches) of it or you will exceed those already un-protective FCC standards on radiation exposure. Not only that but the video flat out LIES about granular information the smart meter can in addition to misleading about bill increases with smart meters.

The Stealth Meters: Analog Meters with Hidden Transmitters

http://www.eiwellspring.org/smartmeter/StealthMeters.htm

Analog meter with hidden PLC transmitter. The serial number has been blanked out to protect privacy.

A General Electric meter with a PLC transmitter mounted on the bottom. The green circuit board can be seen. The Turtle logo on the white label identifies the meter as a PLC transmitter. The white label has a bar code on it, which is blanked out for privacy.

The above picture shows the lengths utilities and possibly even manufacturers will go to mislead consumers into thinking they have a safe analog meter when in fact what they have is a "Trojan smart meter" or a hidden smart meter disguised with an analog facade.

Utilities Lying About Smart Meters:

http://smartmeterwarnings.wordpress.com/2011/11/10/utilities-lying-about-smart-meters/

Do the radio waves that transmit the smart meter data pose a health risk? Answer: "No, they do not. The radio frequency (RF) power density from smart meters is minimal – about one one-thousandth as much as a typical cell phone. In fact, smart meters operate well below the Federal Communications Commission's adopted Maximum Permissible Exposure (MPE) limits for radio transmitters of all types, smart meters included. Plus, the smart meters are on the outside of your home. And each smart meter is only 'on' for a minimal portion of the day – a maximum of 100 seconds total – to regularly communicate your energy consumption data."

San Francisco resident Amy O'Hair has a radio frequency meter and decided to check up on the utility claims. "Remember, the crappy science methods of the utilities mean that they 'time-average' the RF–meaning something like if you have a 3-millisecond pulse of 100 microwatts/CM2, followed by 5,997 milliseconds of no RF, they call that 6 seconds of 0.05 microwatts/CM2 of RF energy**. When they say the meter only emits '45 seconds per day' they don't tell you that means 15,000 pulses. Only when you yourself measure can you discover the truth behind these shady and dangerous deceptions."**

According to the Youtube video of Amy's meter readings Smart meters at close range emit 5-40 microwatts of RF radiation per centimeter squared. **Standing next to a cell phone tower her readings were about 5 times less. If your apartment is behind the bank of meters for the entire apartment, you are getting bombarded with 30-200 watts/cent sq. according to her meter, and because the pulsing overlaps it is nearly a constant radiation.**

EPB Electric Power: Smart Meters

https://www.epb.net/power/home/products/smart-meters/

The below questions were being asked of energy provider, EPB and COUNTLESS utility companies across the nation:

Do the radio waves that transmit the smart meter data pose a health risk?
Answer: "No, they do not. The radio frequency (RF) power density from smart meters is minimal – about one one-thousandth as much as a typical cell phone…Plus, the smart meters are on the outside of your home."

Clearly, EPB was attempting to mislead the consumer into a false sense of security by implying that since the smart meter was located on the outside of the home, they were safe as the signals they were worried about would not be able to "get them" if they are inside the home. Nothing could be further from the truth, as radiation of course goes through walls and signal strength and frequencies are even used as selling points when manufacturers advertise their smart meters:

Silver Spring Networks:

http://tinyurl.com/mohdaex

"Radios offering the **highest permissible power to penetrate walls, basements and other "hard-to-hear" areas**"

"900 MHz provides superior propagation characteristics, allowing the signal to **travel longer distances and penetrate obstructions better**"

Additionally, as we see in the Santa Cruz Dept. of Public Health study, Dan Hirsh's graph of how much radiation is emitted from a cell phone as compared with a smart meter, the smart meter clearly surpasses radiation levels by several orders of magnitude.

The utilities have turned to the FCC to back their stance of "no harm" from smart meters and smart grid. The FCC "safety standards" are based solely on heating or thermal effects, completely and totally void of any and all non-thermal effects from pulse modulation, phase modulation, frequency, low power and higher power density.

Although the below example refers only to cell phones, the same theory applies of course to all microwave radiation emitting products and infrastructures.

The Legislators Guide to Warning Labels on Cell Phones and The Layman's Guide to the Science Behind Non Thermal Effects from Wireless Devices and Infrastructure

http://www.thepeoplesinitiative.org/images/pdf/Home/Non_Thermal_Paper_10-10_AAA.pdf

NON-THERMAL…A PUBLIC POLICY DEFINITION AS OPPOSED TO A SCIENTIFIC DEFINITION

Regarding cell phone microwave radiation transmissions: It is important to note that when we use the term **"non thermal",** we are only referring to levels below 1.6 W/kg **(watts per kilogram of tissue)** since that is the number by which the FCC has set our current health and safety standards. This threshold for health effects was set by the FCC with consult from **industry associations**."

"According to our government agencies, anything over 1.6 W/kg is in danger of heating or thermal effects. Anything *under* 1.6 W/kg is according to our government agencies, "*non-thermal"* and *not* in danger of heating or thermal effects, therefore, supposedly not a threat to human health. Thermal energy is created by the oscillation of cells or even the vibration of atoms. Technically the term "non-thermal" could mean no heat, or no vibration of atoms. However, when used in the context of EMF, the term non-thermal refers to "no temperature rise". **Some scientists believe *all* non-ionizing radiation is thermal, even at very minuscule levels, because the cells are oscillating or atoms are vibrating, thereby generating a certain amount of heat even if it is infinitesimal.**"

"Additionally, there are **properties or characteristics** of the transmissions or radio waves that are also considered to be **non-thermal, but highly toxic and potentially deadly.** Some of these non-thermal properties are discussed in this paper and can be considered to be **in a different category than temperature**. **They are simply parts of the way the information on the radio wave is delivered to our bodies**."

"The most important thing to understand throughout, is that regardless of what is considered

thermal and non-thermal, there are biological and health effects found far ***below*** the threshold of 1.6 W/kg, that the evolution of this technology is advancing very fast with absolutely no regard for the impact on human health, **that there are characteristics of the transmissions that can be considered in a different category than heat altogether and that the current *SAR safety standards do not account for any of this and do not protect human health* from a myriad of deadly health effects and illnesses, including cancer and genetic damage. So this means either heat is found below 1.6 W/kg, or there is something else going on in the transmission that is unrelated to heat that is causing the biological and health effects, or both. We address both of these non-thermal issues in this paper."**

Thermal Vs Non Thermal Debate *(A red herring)*

http://sagereports.com/smart-meter-rf/?p=328

Magda Havas, BSc, PhD

.1 Thermal vs. Non-thermal Debate. The thermal vs. non-thermal debate is largely a **red herring** that has been perpetuated for decades and has influenced the type of research done in the United States. The FCC standard is based on a **thermal** effect. It was originally based on the amount of radiation that would heat an adult male in the US military exposed to radar. While the heating effect is not disputed, **biological effects, some of which have adverse health consequences, occur well below the thermal guideline (Inglis 1970).** As a consequence various countries in the world are opting for a "**biologically**" based guideline rather than a "**thermal**" guideline, **which takes into account not only adult males in peak physical conditions but children, pregnant women, the elderly, and those who have developed electrohypersensitivity (EHS).** I will return to the concept of EHS later.

Non Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter

http://www.icems.eu/papers/ramazzini_library5_part1.pdf

Dr. Livio Giuliani: **"A Fairy Tale"**

"We know very well the interaction between electromagnetic fields and living organisms: it is thermal interaction. Thus the standards internationally accepted to protect workers and the public are adequate. "

"**This is a fairy tale. Since the 1970s the non thermal effects of electromagnetic fields on living organisms has been investigated. Nevertheless until today we have been**

condemned to listen to representatives from international institutions repeating the same old refrain above."

23) Smart Grid and Smart Meters Violate FTC Act of the Federal Trade Commission

http://www.federalreserve.gov/boarddocs/supmanual/cch/ftca.pdf

"An act or practice may be found to be Unfair where it **"causes or is likely to cause substantial injury to consumers which is not reasonably avoidable by consumers themselves** and not outweighed by countervailing benefits to consumers or to competition.**"8 A representation, omission, or practice is deceptive if it is likely to mislead a consumer acting reasonably under the circumstances and is likely to affect a consumer's conductor decision regarding a product or service."**

"The standards for unfairness and deception are independent of each other. While a specific act or practice may be both unfair and deceptive, an act or practice is prohibited by the FTC Act if it is either unfair or deceptive."

Smart grid certainly injures consumers and certainly consumers are unable to avoid both the dirty electricity that smart meters and smart grid put onto the electrical wiring throughout the home and entire neighborhood that is within the smart gridded area, in addition to the pulsed RF microwave emissions that is also inescapable, no matter where the customer goes and in most cases, even if they opt out.

Customers have been CONTINUALLY and CONSISTENTLY misled in the areas of health effects, over billing, fire hazard and the privacy aspect of smart grid and smart meters.

24) FALSE AND MISLEADING CLAIMS OF ENERGY SAVINGS/SMART APPLIANCES AND ENERGY STAR AS HOAX TO GAIN TAX PAYER DOLLARS

Smart meters are appliances that run 24/7, that you CANNOT SHUT OFF, as is the case with ALL Smart appliances. The smart meters running 24/7 on every appliance in the home or

office, including the meter on the structure used to measure all the other HAN (home area network) smart metered appliances, will account for an enormous INCREASE in electricity usage that did not exist prior to the introduction of smart meters and smart metered appliances! Analog meters in contrast, use an infinitesimal amount of energy, relying primarily on the magnetic fields of electricity usage to spin. ***The consumer ends up footing the bill for the smart meters and smart appliances extra energy usage! This is something that has been TOTALLY unaccounted for in industry and government calculations when talking energy conservation – one of the primary selling points the government has used to push this violating program on the public.*** *If we have approx. 314 million people in the US, or approx. 100 million households, plus another 30 million businesses, all with their own smart meters, plus the smart grid metering infrastructure, all of which have is required to run its devices 24/7,* ***this is an increase use in energy that is simply STAGGERING when comparable to what the analog meter used. This may account for part of why most consumers see enormous bill increases and also energy usage increases upon installation of a smart meter. Think about it…ANY appliance that is left on 24/7 is an energy "vampire".***

The extremely clever manufacturers vying for free public tax payer funds on the federal stimulus give away also came up with this ingenious master plan:

Smart Appliances and Energy Star As Hoax To Gain Tax Payer Dollars

http://stopsmartgrid.org/wp-content/uploads/2013/11/Smart-Appliances-and-the-Energy-Star-Hoax-1A.doc

"Energy Star appliances, sold to the public and Congress as using less energy, less carbon emissions and less utility bills, in many circumstances actually consume MORE energy than NON Energy Star appliances. This is no accident. This **exception** for **Energy Star to be able to consume more energy than other appliances and still receive tax credits was actually LOBBIED for by Energy Star Manufacturers."**

"Smart appliance manufacturers lobbied for an allowance for their products to be able to increase energy usage, but be able to qualify for the federal discount program. Thus the Energy Star rating is actually a hoax to enable Energy Star product producers to receive US citizen tax payer money while in fact exceeding energy usage when compared with non-Energy Star appliances"

Smart grid and smart appliances in connection with Energy Star are NOT MORE energy efficient

"The rollout of Smart Appliances poses a challenge for manufacturers and policy makers because they are more expensive and may consume more energy than non-smart appliances because of the additional functionality. The more expensive piece is usually not a challenge for policy makers as they have the ability to write energy efficiency legislation that provides either tax credits or grants and programs to consumers to subsidize the cost. These incentives spur sales. The problem? For decades now, these subsidies are only given to products that achieve the "Energy Star" designation."

"In order to resolve the problem of the "Energy Star" designation, the Association of Home Appliance Manufacturers ("AHAM") proposed that "Smart" appliances be given a "5% Connected Allowance". What this allowance does is allows smart appliances to consume more energy than non-smart appliances and still get an Energy Star designation and qualify for the financial incentives."

"The problem with this "connected allowance" is that a smart appliance on its own does not save energy or provide energy efficiencies. It needs to be coupled with other smart paraphernalia, such as a "Home Energy Controller" unit, utility programs ***and*** be used by the consumer (many appliances have override features).
So in reality, this is a hoax. If the consumer buys the smart appliance and uses it like a non-smart appliance i.e., doesn't sign up for a utility demand response program, have the Zigbee enabled HEMS (Home Energy Management system – a Zigbee enabled platform which acts as a conduit between the smart appliances and smart meter) or have other energy using smart paraphernalia such as a smart meter paraphernalia or set the delay features, etc.), taxpayers will be subsidizing a device that actually uses ***MORE*** energy."

"The Department of Energy and the EPA jointly run the Energy Star Program. They are therefore colluding in this hoax as they just approved this 5% connected allowance in the new Energy Star requirements for refrigerators/freezers. Policy makers are also in on the hoax as there appear to be many energy efficiency bills in process to allocate funds through grants to incentivize the purchase of smart appliances."

"The Association of Home Appliance Manufacturers (AHAM) got together in 2010 and developed a joint resolution to petition the EPA (who jointly runs Energy Star with the Dept. of Energy) to give smart grid ready appliances a 5% credit. Their smart grid policy statement can be found here:"

http://www.aham.org/industry/ht/d/sp/i/46155/pid/46155

"AHAM believes that in order for the Smart Grid to be successful, there are three essential requirements for the Smart Grid's interaction with consumers:

1. **Pricing must provide incentives to manage energy use more efficiently and enable consumers to save money.**

2. **Communication standards must be open, flexible, secure and limited in number.**
3. **Consumer choice & privacy must be respected; the consumer is the decision maker.**

AS THIS ARTICLE AND DOCUMENT ATTEST, NONE OF THE ABOVE OBJECTIVES HAVE BEEN ACCOMPLISHED.

The joint resolution was sent to the EPA in Jan 2011 to petition them for a credit,

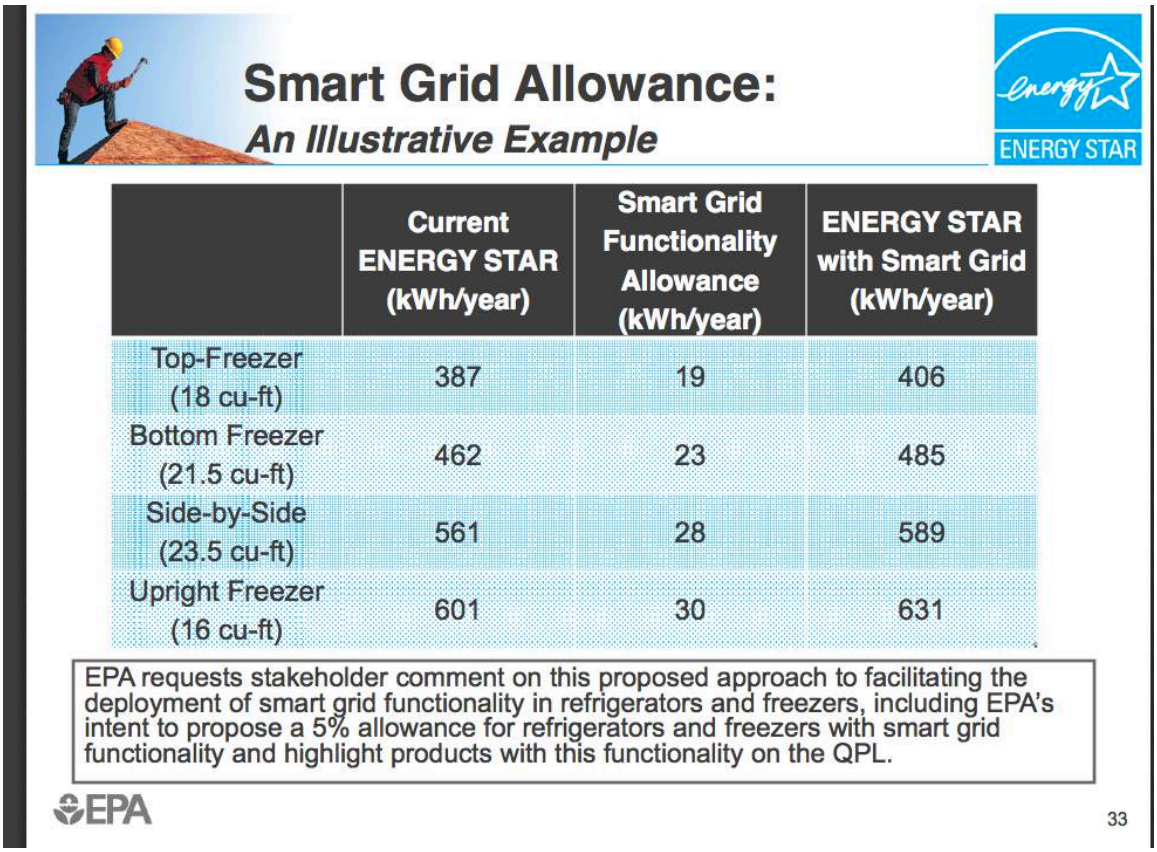
http://www.aham.org/ht/a/GetDocumentAction/i/51594

The Joint Stakeholder Proposal

1. The Joint Proposal is to provide **a five percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for the smart-grid enabled appliances** that are included in the Joint Proposal, which includes residential refrigerator/freezers, clothes washers, clothes dryers, room air-conditioners, and dishwashers**. A five percent credit means that smart appliances would be allowed to use five percent more energy than non-smart products that earn the Energy Star designation.**

“If you look at the presentation the EPA did on July 25 2011 and go to pages 30-37 where they deal with the smart grid, you will see on page 33 the "hoax". “

https://www.energystar.gov/products/specs/system/files/V5.0_Specification_Framework_Presentation.pdf



"It is a "hoax" because they will be allowing smart grid capable appliances, which actually consume **MORE** energy, to get the Energy Star designation based on the "POTENTIAL" to reduce energy and peak load demands. The California Association of Investor Owned Utilities, which includes PG&E, argued against this credit – rightfully so…"

https://www.energystar.gov/products/specs/sites/products/files/California_IOUs_Comments_V5_Refrigerator_Framework.pdf

> "…the financial benefits and peak demand savings of smart, DR capable appliances will depend on a number of unknown future factors, such as: The number of demand reduction events, the percent of customers who can receive DR signals and act upon them using smart products or other means, the percent of customers who are willing to shift loads or otherwise curtail demand, and the percent of load shifted for a particular appliance."

"Bottom line, we could be subsidizing someone buying a smart appliance but does not use the smart features and therefore does not result in energy savings or reduction of peak loads."

The EPA went on to approve the 5% credit in it's newly issued Energy Star specifications on May 31, 2013 to take effect in 2014.

https://www.energystar.gov/products/specs/sites/products/files/ENERGY%20STAR%20Final%20Version%205.0%20Residential%20Refrigerators%20and%20Freezers%20Specification.pdf

As stated in this article, they will use the energy star rating to encourage these smart connected appliances:

http://www.fiercesmartgrid.com/story/epaenergy-star-appliances-encourage-smart-grid-functionality/2013-07-02

References

SmartGrid.Gov – The Smart Home - http://www.smartgrid.gov/the_smart_grid#smart_home

Pacific Northwest National Laboratory, Use of Residential Smart Appliances for Peak-Load Shifting and Spinning Reserves Cost/Benefit Analysis REPORT, December 2010
http://www.aham.org/ht/a/GetDocumentAction/i/51596

June 28, 2010 presentation by Chuck Goldman, Lawrence Berkeley National Laboratory, at the Mid-Atlantic Conference of regulatory Utility Commissioners "Smart Grid – Metering, Cost recovery, Demand Response"
http://smartresponse.lbl.gov/reports/ma-meters062510.pdf

Demand Response Enabled Appliances – Key to the Smart Home, David Najewicz General Electric Consumer and Industrial , June 8 2009, Santa Clara CA
http://eetd.lbl.gov/sites/all/files/connectivity_week_najewicz-web.pdf

INITIAL COMMENTS OF NORTHEAST UTILITIES EXECUTIVE SUMMARY

http://haltmasmartmeters.org/wp-content/uploads/2014/01/NSTAR_R12-76-Comments-7986-POSTED01172014_HIGHLIGHTED.pdf

"…customers value price and reliability above all else and the implementation of AMI serves neither of these objectives."

"An Advance Metering System is not a "basic technology platform" for grid modernization and is not needed to realize "all of the benefits of grid modernization."

"The Department identified four objectives for grid modernization, all of which can be achieved without the implementation of an advanced metering system."

"**Meters do not reduce the number of outages; metering systems are not the only option for optimizing demand or reducing system and customer costs; and metering systems are not necessary to integrate distributed resources or to improve workforce and asset management.** Therefore, it is not correct that advanced metering functionality is a "basic technology platform" that must be in place before all of the benefits of grid modernization can be fully realized, as the Department suggests."

"Accordingly, not only is there a flaw in the Department's premise that an advanced metering system is a "basic technology platform" for grid modernization, but also **the implementation of a costly, advanced metering system is at odds with policies designed to promote the growth of distributed energy resources."**

"…Northeast Utilities consistently raised the concern that the costs associated with AMI are currently astronomical, while the incremental benefits for customers are small in comparison."

"The decision to implement AMI goes against the best business judgment of the Companies and cannot be rationally cost justified in terms of a net benefit for the overall customer base that will pay for the investment over the long term."

"…there is no cost justification that can support the implementation of AMI."

"Last, but not least, there is little confidence that the incremental benefits of moving to an AMI platform will be sufficient to warrant the cost. "

"There is ample evidence that this technology choice will be unduly costly for customers and that the objectives of grid modernization are achievable with technologies and strategies that rank substantially higher in terms of cost-effectiveness. For customers who will pay the price of this system, there is no rational basis for this technology choice."

"…there is no rational basis for the implementation of AMI. Among many other considerations, achievement of the Department's four grid-modernization objectives does not require the implementation of AMI, despite the Department's suggestion that it does."

"**Meters do not reduce the number of outages; metering systems are not the only option for optimizing demand or reducing system and customer costs; and metering systems are not necessary to integrate distributed resources or to improve workforce and asset**

management. Therefore, it is not correct that advanced metering functionality is a "basic technology platform" that must be in place before all of the benefits of grid modernization can be fully realized, as the Department suggests."

"Accordingly, not only is there a flaw in the Department's premise that an advanced metering system is a "basic technology platform" for grid modernization, but also the implementation of a costly, advanced metering system is at odds with policies designed to promote the growth of distributed energy resources."

"…the incremental benefit of AMI is largely limited to the communications element, which can be addressed in other ways without incurring the cost of the meter. "

"It is also unclear whether the incremental benefits, if any, would begin accruing to customers prior to the implemented AMI platform being rendered obsolete. In any event, the cost remains unjustified by the benefits."

"Department has in effect created a recovery mechanism for the most expensive grid-modernization technology with the least certain benefits,"

"An Advance Metering System is not a "basic technology platform" for grid modernization and is not needed to realize "all of the benefits of grid modernization."

25) FALSE AND MISLEADING CLAIMS OF CONSUMER CONTROL AND EROSION OF CONSUMER RIGHTS WITH SMART METERS AND SMART GRID

Not only do vulnerable citizens have no freedom of choice as to whether or not they wish to be exposed to the deleterious biological and health effects that the pulsed microwave emissions smart meters and smart grid emit, which can also dangerously interact with medical device implants, but they also have no control as to who gets to see their electricity, water or gas usage, including granular utility usage, be it government entities, hackers, burglars or adverse actors of any kind.

PRIVACY INVASION

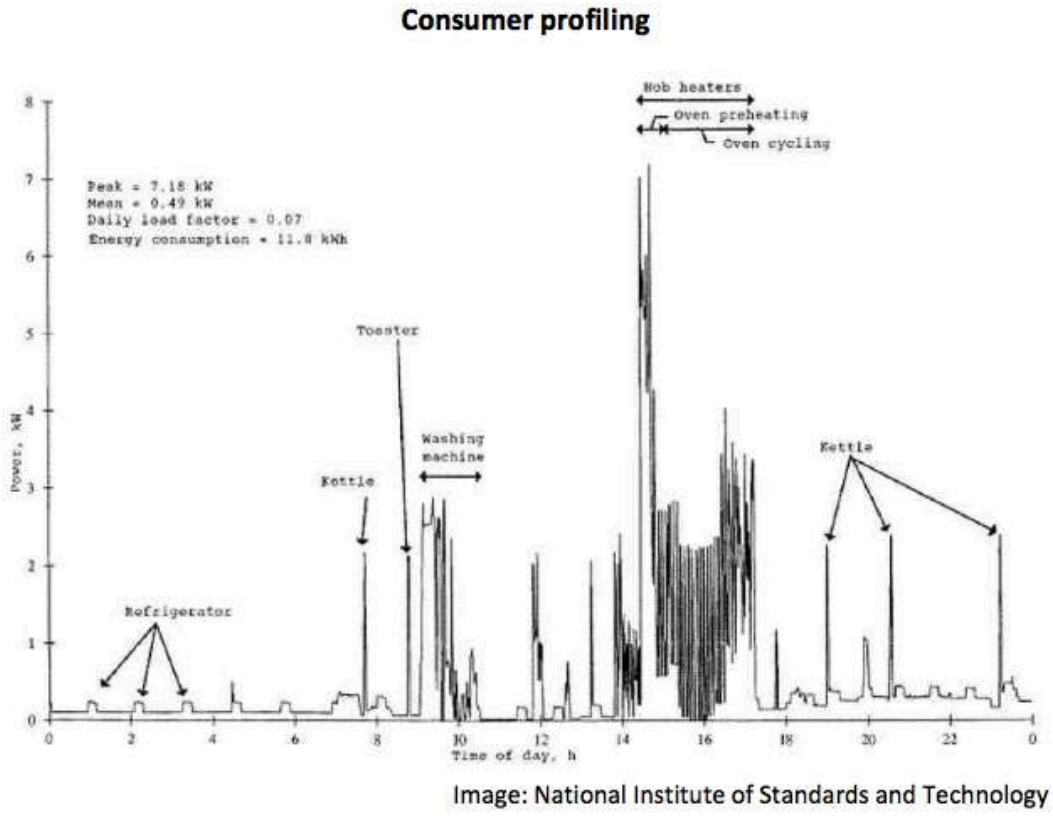


Image: National Institute of Standards and Technology

What appliances were being used, at what time and for how long are clearly visible from the above graph.

Additionally, ***apparently smart meters also relay significant amounts of private information about the activities of the inhabitants of the home even without the use of the HAN (Home Area Network):***

EPB Electric Power

https://www.epb.net/power/home/products/smart-meters/

What if I don't want you to have more information about my power consumption?
"Rest assured that you are in control of your power consumption. The information we will be able to access with the smart meters is no different than the information that we are able to access currently."

Will the smart meter be able to tell what appliances I am using in my home?

"Only if you want it to. If you choose to install smart appliances or devices that monitor how much electricity is used to run specific appliances, you will be able to see how much power is being used by which appliances. However, we will not have access to that information unless you want to share it with us."

Clearly, both of the above statements from EPB are totally false. The following excerpt is from Naperville, Illinois, where an electricity customer had only a smart meter on her home, no HAN (home area network) connected and sent her information to another person – a non utility employee – in other words, a layman. This layman was able to deduce exact activity within the customer's home down to the minute…

Naperville Smart Meters Keep Track of Household Activates Down to the Minute

http://thetruthaboutsmartgrids.org/2013/10/03/smart-meter-data-reveals/

"The granular energy usage data for the first page of the document I had been sent was for April 26, 2013. I scanned it for a few seconds and noted clear patterns in the numbers (and without initially graphing the information) wrote the following message to the Naperville resident:"

"***Incidentally, for example, it appears on April 26, you got up pretty early? You have increased energy usage starting at about 4:30 am. Do you [normally] get up that early? Particularly high usage from 5:45 am to 6:00 am. … Then it looks like no one was home from about 8:30 am until 3:00 pm. You likely went to bed about 10:15. Does that sound about right***?"
The resident wrote back and was quite shocked at what I was able to deduce from just a quick scan of the information I had been sent."

All this is WITHOUT the HAN (home area network)!!

Further erosion of consumer control are ***remote disconnects****, which also come with large fees paid to the utilities when consumers have their utility disconnects reversed. This is not only a cash cow for the utilities but a brand new unnecessary financial burden to consumers. However, there are other even bigger problems with remote disconnects:*

In addition to opt outs being a fraud, customers will also be and are now, at the mercy of dishonest utility companies lying about the frequencies, power densities, pulse modulations, everything having to do with smart meter emissions will be 100% up to the utility, leaving the customer 100% in the dark about their exposure to these harmful emissions.

Power Shut Offs Increase with Arise in Smart Meters

http://abclocal.go.com/kgo/story?section=news/7_on_your_side&id=7555472

"Family dies due to house fire from candles after remote disconnect by PG@E. Pages remote disconnects surged the amount of disconnects by approx. 10 fold, from 4,300 before smart meter installation, to 53,000 after smart meter installation."

Jump in Service Disconnections Sparks Move by California

http://articles.latimes.com/2010/feb/05/business/la-fi-puc-disconnect5-2010feb05

"PUC members said they were alarmed that growing numbers of recession-racked Californians were getting their lights turned off because they couldn't pay their bills. What's worse, they're getting hit with disconnection and reconnection fees that range from $270 to $681, the PUC said."

If we take the equation of 53,000 shut offs – 4,300 shut offs = 48,700 more shut offs per year, then multiply that by the average amount of a re-connect fee which according to the below article is approx. $425, this means $425 re-connect fee x 48,700 extra shut offs per year = ***$20,697,500.00 extra income for PG@E*** *and loss of funds for PG@E customers.* ***Remote shut offs are a cash cow for the utilities and an enormous financial liability for customers.***

Also from the report, nearly 50% of the shut offs were for low income families.

Other burdensome and life threatening impact of remote disconnects have been documented as follows:

Remote Disconnections – An Erosion of Customer Rights

AARP, National Consumer Law Center and Public Citizen Comments to: DEPARTMENT OF ENERGY Smart Grid RFI: Addressing Policy and Logistical Challenges

http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/AARPNCLCPublic_CitizenCommentsDOE1101.pdf

“Smart meters have been touted by industry proponents as offering the benefit of remote disconnection. **From a consumer perspective, this is not a benefit but rather an erosion of fundamental consumer rights**.”

“When a CMP worker physically visits the premises to disconnect the power it not only reduces the chance of a wrongful disconnection, it also gives a non-paying customer one last chance to pay and avoid the dark. **These benefits and protections vanish with AMI.”**

“Particularly in hot summer or cold winter areas, or those who have medical devices or must keep the temperature at a certain level because of health problems, **the risk to human life is substantial.”**

“What if people cannot pay their bill during hot or cold weather? What if elderly people who have become forgetful, forget to pay their bill? What if there is a mistake? There may be no second chance when the power is disconnected. A simple check by a human can remind someone to pay the bill, or give information on financial help to pay the bill, or verify that it is the right address. “

“Residential customers who are remotely disconnected without a last chance to make payment arrangements, or who shut themselves off with no utility contact (when their prepayment card runs out of funds) **are at great risk in terms of health and safety.”**

“A recent investigative news report from Texas (where deregulated electricity commodity vendors can offer service on a pre-paid only basis) tells of vulnerable pre-payment electricity customers being cut off without notice…**A paraplegic who requires air conditioning to maintain a safe body temperature lost his electricity on days when the temperature exceeded 100 degrees.”**

“A heart failure patient who needed power for an oxygen machine was cut off twice by her pre-payment meter in one summer.”

“The risks of disconnection by remote control or by automatic action of a pre-payment meter or service limiter are also shown in the case of a 90-year old Michigan man who froze to death in his own kitchen last winter. When he was found, there were funds to pay for his bill on the table. But he had missed a payment and the utility had installed a service limiter. When the service limiter tripped, the gentleman could not or did not know how to reset the limiter.”

“Customers whose utilities are disconnected have died from hypothermia, from fires set by candles used for lighting in the absence of electricity, and from other consequences of loss of power. The concern of consumer advocates over the dangers of involuntary remote controls on household usage cannot be overstated.”

And with a remote shut-off, what are the possibilities of the signal going to the wrong house? With potential for mistakes, especially with this wirelessly involved system, the wrong household pays the consequences.

There are too many ways for this system to fall apart and harm people, especially with utility companies that already exhibit a disregard for the public's welfare or have difficulty with existing record-keeping. It's just too easy to flip a switch back at the head office.

However, of much greater impact is the threat of intentional disconnection by really anyone with little or great technical know-how, whether on purpose or by accident. They could disconnect an individual home, a neighborhood, a city, a region, or our nation. The cost of injury and death, and damage to our society is beyond calculating.

If the goal of the government truly was to promote energy reduction, it would simply give citizens a simple measurement instrument that costs around $20 and give them free online access to their power consumption, which since the roll out of smart meters and smart grid, has been completely dismantled.

Google Power Meter

http://en.wikipedia.org/wiki/Google_PowerMeter
"Google PowerMeter was a software project of Google's philanthropic arm, Google.org, to help consumers track their home electricity usage.[1] ...It was launched on October 5, 2009 and ended on September 16, 2011.[2]"
"The software was designed to record the user's electricity usage in near real-time."
Lower energy usage could also be incentivized through lower rates for lower energy usage, plain and simple. Thus we are forced to believe that lower energy usage is not the true goal of smart meters or the smart grid. However, there are other more nefarious uses of smart meters and smart grid that WOULD require this type of metering system…

Smart Meters Are An Even Larger Threat Than I Had Thought: A More Detailed Consideration of Smart Meters' Microwave Technology, and Its Threats to Health and Civil Liberties

http://www.non-toxicnurse.com/smart-meters-are-an-even-larger-threat-than-i-had-thought-a-more-detailed-consideration-of-smart-meters-microwave-technology-and-its-threats-to-civil-liberties/

Remote Customization Capabilities of Smart Meters: Paving the Way for the Age-Old "Bait and Switch" Tactic

"In an effort to win community approval of smart meter roll-outs, the power industry can install smart meters that do not have their 2.4 GHz HAN capabilities activated at the time of installation. These meters do however contain the internal Zigbee chip/RFR transmitter. Therefore, at a later date, **when citizen concern regarding the exact operating frequencies of the smart networks has died down, the utility company can proceed with remotely activating the 2.4 GHz ZigBee RFR transmitters inside the smart meters**. **Citizens not in possession of RF meters and the time or desire to supervise the operating habits of their smart meter, will be none the wiser.** Therefore, citizens need to be aware that electric companies that claim their smart meters will be operating only at the 900 MHz frequency – which is also, contrary to public knowledge, biologically harmful - just as all RF frequencies are, are typically misleading the public and again, the utilities are using deceptive business tactics in order to ensure roll out of smart grid and therefore reap citizen tax payer funds, offered by the federal government for full service area smart meter and smart grid penetration."

26) "TIME AVERAGED" MISLEADING REGARDING SMART METER AND SMART GRID MICROWAVE EMISSIONS

"Time-averaging" RF pulses emitted by smart meters or smart grid is a mathematical method the utilities and their pundits use to mislead the public into thinking not much is happening in terms of RF exposure. Instead of providing the true maximum, or "peak" power, of those RF pulses, time-averaging takes the time intervals of the pulses, and averages it with the intervals of time when the meter is not pulsing; an example would be to fire a gun ten times in a day, then average the intervals of the actual firing of the gun with all the time when the gun not fired. The resulting number for impact or pounds per square inch or velocity is meaningless, a junk number. It is designed to lessen the impact of the firing of the gun in the mind of the person looking at the numbers, when in reality, firing a gun is firing a gun. It is only the split second of the gun firing that matters, not the time in between when the gun is not fired. The mere act of firing the gun into human flesh causes the harm, not the time when the gun is not fired into human flesh.

PG@E Understanding Radiofrequency (RF)

http://www.pge.com/myhome/edusafety/systemworks/rf/

"Consider that SmartMeters™ transmit only about 45 seconds a day"

Although the above statement turned out to be false, what the utilities do not tell customers is that those few minutes are not all at once, they are divided up into thousands of powerful millisecond bursts, 24/7, spread out all through the day so the customer is essentially pummeled all day long by bursts of harmful radiation. *The below confession to the CPUC by PG@E (after keeping this information from customers) shows the actual amount of pulses emitted throughout the day for any given smart meter.*

PG&E's Big Confession

http://emfsafetynetwork.org/?p=6030

"PG&E says **the average number of RF pulses for the electric meter would be about 9,900, per meter, per day and the maximum number over 190,000**". See below page from PG@E CPUC filing.

PACIFIC GAS AND ELECTRIC COMPANY'S RESPONSE TO ADMINISTRATIVE LAW JUDGE'S OCTOBER 18, 2011 RULING DIRECTING IT TO FILE CLARIFYING RADIO FREQUENCY INFORMATION

http://emfsafetynetwork.org/wp-content/uploads/2011/11/PGERFDataOpt-outalternatives_11-1-11-3pm.pdf

Question 2:

How many times in total (average and maximum) is a smart meter scheduled to transmit during a 24-hour period?

Response 2:

Electric: Table 2-1 presents scheduled electric SmartMeter™ system messages and their durations. As noted in Response 1, the information presented applies only to the 900 MHz radio. Table 2-1 presents data for all "scheduled" messages; i.e., those inherently required to sustain communications in the network that occur routinely without user intervention. "Non-Scheduled" messages created only at non-recurring times are addressed in Response 3.

TABLE 2-1

Electric System Message Type	Transmission Frequency Per 24-Hour Period: Average	Transmission Frequency Per 24-Hour Period: Maximum (99.9th Percentile)
[a]	[b]	[c]
Meter Read Data	6	6
Network Management	15	30
Time Synch	360	360
Mesh Network Message Management	9,600	190,000
Weighted Average Duty Cycle	45.3 Seconds[4]	875.0 Seconds

The electric system message types are defined as:

- Meter Read Data refers to the messages generated by each meter to transmit energy usage data.
- Network Management refers to network tasks that need to be performed to maintain the health of the network (e.g., route establishment).
- Time Synch refers to network administration messages needed to update the internal clock in the NIC.
- Mesh Network Message Management refers to activities required to forward routed messages.

Gas: Table 2-2 presents scheduled gas SmartMeter™ system messages and their durations.

TABLE 2-2

Gas System Message Type	Transmission Frequency Per 24-Hour Period: Average	Transmission Frequency Per 24-Hour Period: Maximum
[a]	[b]	[c]
Meter Read Data	4.228	4.305
Weighted Average Duty Cycle	0.676 Seconds	0.689 Seconds

[4] As stated in Response 1, a small number of electric SmartMeters™ communicate somewhat longer than 45 seconds-per-day, which resulted in an overall mean duration of approximately 62 seconds.

27) FALSE AND MISLEADING CLAIMS OF FINANCIAL SAVINGS AND RAMPANT, UBIQUITOUS OVER BILLING

SMART METERS BRING NO SAVINGS BUT SUBSTANTIAL COST INCREASE TO CONSUMER

http://www.ocregister.com/taxdollars/strong-478754-sce-smart.html

"After studying SCE's plans to deploy the meters, three analysts said that economic benefits to consumers have not necessarily been accruing at the rate Edison **promised, some may be delayed and others may be lost all together."**

"…the program may cost more than initially projected and the consumer may receive less savings."

"The SmartConnect business case implicitly included post-deployment costs of **$1.582 billion** in addition to the explicitly approved deployment costs of **$1.634 billion**," the study said."

"SCE customers in aggregate have so far experienced a revenue requirement **increase in excess of $193.1 million** to cover these costs. **This is a real cost increase, one which will certainly rise as more meters are purchased and deployed, and as SCE begins to incur post-deployment costs."**

"Total SmartConnect costs paid by customers will actually be more than $5 billion, DRA said, including post-deployment and financing costs over the 20 year life of the SmartConnect system."

"…billions of dollars in U.S. federal subsidies for smart meters have been misspent because the technology will not lead to energy sustainability or contribute to the possibility of a more efficient and responsive electricity grid"

Pilot test of ComEd's smart grid shows few consumers power down to save money

http://www.chicagobusiness.com/article/20110528/ISSUE01/305289982/pilot-test-of-comeds-smart-grid-shows-few-consumers-power-down-to-save-money

"A new report by independent researchers shows that less than 9% of about 8,000 randomly selected households used their newly installed smart meters to save money by adjusting thermostats or turning off appliances during the afternoon or on hot days. As part of the test, ComEd imposed higher rates or offered rebates during peak- demand hours to encourage

consumers to cut back. Overall, reduced demand from those paying variable rates was "statistically insignificant," the report says. In a few cases, some households inexplicably used more energy during peak hours when rates were higher…"

"It's devastating to their plan," says Susan Satter, senior assistant Illinois attorney general for public utilities. **The report shows "zero statistically different result in usage, compared to business as usual."**

Connecticut Attorney General warns that the pilot results showed that smart meters had no beneficial impact on total energy usage or bill savings and that the advanced technology is very expensive.

GUARANTEED HIKES

"The bill, which would increase ComEd's electricity rates to pay for up to $2.6 billion in new equipment over the next decade, is near veto-proof approval by the Illinois General Assembly, despite strong opposition from consumer interests…" Overall, reduced demand from those paying variable rates was "statistically insignificant," the report says. In a few cases, some households inexplicably used more energy during peak hours when rates were higher, which the report called "counterintuitive"

Skyrocketing water bills mystify, anger residents

http://www.cnn.com/2011/US/03/01/water.bills.war/index.html

"Over two months last summer, her family's monthly water bill, shot up to $1,805 In July and then $1,084 in August, leaving a balance due of more than $3,000. She said in the past her bill has averaged $200 to $250."

'Smart' Meters Draw Complaints of Inaccuracy

http://www.nytimes.com/2010/11/13/business/13meter.html?pagewanted=all&_r=0

"In his case, he says it is inaccurately measuring his family's power use and driving up his bills — some months by as much as 50 percent, to as high as $320 — since it was installed in December. This, he said, is despite his efforts to cut back on energy use."

"I've done two tours in Iraq, and when I come home I'm getting ripped off by my electric meter," said Sergeant Robertson, who with his wife, Kim, is raising four children on a tight budget."

“In Maryland earlier this year, state regulators, aware of the discontent around the country, temporarily blocked a utility’s smart-meter proposal, sighting inadequate planning and the potential cost to consumers.”

Not-So-Smart Meters Overbilling Californians

http://www.forbes.com/sites/williampentland/2011/05/03/not-so-smart-meters-overbilling-californians/

“The utility, Pacific Gas and Electric Company, admitted yesterday that about 1,600 so-called “smart meters” had charged customers for phantom power.”

Action 9 investigates smart meter rates

http://www.wftv.com/news/news/local/action-9-investigates-smart-meter-rates/nSQ2r/

Christine Strong moved everything into storage since she can't pay the power bill at her one bedroom apartment. One month after Florida Power and Lights installed a Smart Meter, Strong said she got a $400 bill.

The month before, Strong’s bill was $52. Strong said she can't afford to see next month's smart meter bill. "I'm being forced out by the new meter,” she said.

Germany Rejects Smart Meters

http://www.greentechmedia.com/articles/read/smart-meters-sluggish-policy-germany-rejects-fast-smart-meter-rollout

“Ernst & Young's study found higher costs than benefits for average households. If only customers that received a meter paid for them, it would cost €89 ($118) per household per year to cover device and installation costs, which is more than the expected monetary benefits.”

Texas utilities admit billing errors with SmartMeters

http://abclocal.go.com/kgo/story?id=7386817

“Hundreds of consumers have blamed SmartMeters for overcharges and sudden spikes in their bills.”

“Smart meters over bill consumers from Texas to California.”

Pepco customers find smart meter billing abnormalities

http://www.wtop.com/41/3189937/Pepco-customers-find-smart-meter-billing-abnormalities-

"Two major utilities in Texas have confirmed that some customers received inaccurate and sometimes inflated bills after turning to SmartMeters to measure their energy usage."

"Hundreds of consumers have blamed SmartMeters for overcharges and sudden spikes in their bills."

"Patricia Driscoll says her family's **bill is up 114% over the same time last year.** She's lived in the house in the North Farm area for 29 years."

Man disputes $11,857 bill from PG&E

http://www.kget.com/news/local/story/Man-disputes-11-857-bill-from-PG-E/CWMFzCRF30-rmQ5ygd2moQ.cspx

"A business owner contacted 17 News after PG&E sent him a bill for nearly $12,000 for a piece of farm equipment that hasn't been running on any electricity for the past three months."

"He says this month's bill to run his gyp-silo, a farm silo that mixes calcium into soil, is so ridiculously high, it's comical. In past years, **the electric bills have ranged from $26 to around $80, but after a new SmartMeter was installed, that bill shot up to $11,857.99."**

Oncor Sued for Fraud Over Smart Meters

http://www.greentechmedia.com/articles/read/oncor-sued-for-fraud-over-smart-meters

"After weeks of mounting anger, a class action lawsuit was filed last Friday accusing Oncor of fraud."

"Skyrocketing electricity bills are crushing innocent Texas consumers as a result of Oncor's installation of 'smart' meters," the suit proclaims.

"The suit alleges that Oncor is purposely rolling out smart meters in low-income areas first and that smart meters are a ploy for utilities to "line their pockets" in a deregulated market."

"The Cordts found their bills skyrocketed from $400 to $700 a month to $1,800 after a

smart meter was installed. In three months they racked up nearly $5,000 in electricity bills."

Legal challenge to smart meters

http://calcoastnews.com/2010/12/legal-challenge-to-smart-meters/

Here in California, residents of Bakersfield filed a class action suit against PG&E for substantial billing increases after smart meters were installed. California Senator Dean Florez, the majority Democratic leader in the Senate, demanded a halt to smart meter installations. **"People think these meters are fraud meters," said Florez. "They feel they're being defrauded. They're getting no benefit from these things."**

AUSTRALIA

As shown in the chart below, Victorian metering charges increased by approximately $60 per meter per year after the introduction of AMI cost recovery from customers in 2010 and a projected increase to 125.73 by 2016-2017.[25]

Annual meter charge increases with smart meter costs in 2010 and projections to 2017 ($)

Distributor	2005	2006	2007	2008	2009	2010	2011	2012	2013	2015	2016 2017
SP AusNet	17.49	17.49	17.49	17.49	17.49	86.1	93.83	101.02	108.75	117.08	126.04
United Energy Distribution	6.60	6.60	6.60	6.60	6.60	69.21	89.18	99.57	107.62	116.33	125.73
Jemena Electricity Networks	12.87	12.87	12.87	12.87	12.87	134.63	136.7	155.84	159.86	162.34	164.88
Citipower	15.20	15.20	15.20	15.20	15.20	104.79	108.4	93.38	95.26	97.17	99.13
Powercor	17.20	17.20	17.20	17.20	17.20	96.67	105.35	92.72	93.91	95.12	96.34

ATTORNEY GENERAL GEORGE JEPSEN

JEPSEN URGES STATE REGULATORS TO REJECT CL&P'S PLAN TO REPLACE ELECTRIC METERS

http://www.ct.gov/ag/lib/ag/press_releases/2011/020811clpmeters.pdf

"…to replace existing electric meters with advanced technology would be very expensive and would not save enough electricity for its 1.2 million customers to justify the expense…"

"CL&P's proposal would force the company's ratepayers to spend at least $500 million on new meters that are likely to provide few benefits in return," Jepsen said.

"The pilot results showed no beneficial impact on total energy usage," Jepsen said. "And, the savings that were seen in the pilot were limited to certain types of customers and would be far outweighed by the cost of installing the new meter systems,"

There are thousands of cases of smart meter over billing in the US. It is yet another RAMPANT issue with smart meters.

28) UNJUST ENRICHMENT AND TRESPASS VIA SMART GRID MICROWAVE RADIATION EMISSIONS

http://legal-dictionary.thefreedictionary.com/unjust+enrichment

A general equitable principle that **no person should be allowed to profit at another's expense without making restitution for the reasonable value of any property, services, or other benefits** that have been unfairly received and retained.

Regarding unjust enrichment, we have 2 issues.

1) Utilities are profiting via smart grid at the expense of citizen's health and life.
   Utilities are profiting via smart grid at the expense of citizen's property rights.

http://www.cell-tower-leases.com/how-much-does-each-cellular-antenna-lease-pay-in-new-jersey.html

How Much Does Each Cellular Antenna Lease Pay in NJ?

"A friend of mine has an industrial property in Passaic County, NJ with a cellular T MOBILE flag tower **paying $2000 monthly but his 2nd antenna lease only pays him $1400 on the same tower."**

*Every smart meter is a part of the smart grid, so every owner of every smart meter would qualify for being subject to unjust enrichment by the utilities. However, there are more extreme circumstances whereby the customer is unwittingly being exposed to hundreds of times more microwave pulses than their neighbors are by virtue of being the keeper of a "**collector meter**" or "**Medusa meter**".*

ADVANCED METERING – "COLLECTOR METER" OR "MEDUSA METER"

Someone in the neighborhood has the Medusa Meter or the Collector Meter, receiving thousands or millions of more pulses than everyone else. Utilities are not telling neighbors who has this meter, nor are they informing the keeper of the meter whose property it sits on that their property is being used by the utilities to trillions of more pulses of microwave radiation than the average microwave radiation from an average (but also damaging and deadly) smart or wireless meter. The utilities are in effect, using people's homes and property to carry their telecommunications transmissions, not compensating people for doing so and not informing them of the extra burden of trillions more microwave pulses their meter will be receiving in comparison to their neighbor's meters.

http://stopsmartmetersirvine.com/2012/03/03/medusa-collector-smart-meter-ladera-heights-california-and-dead-bees-on-walkway-near-smart-meter-irvine-california/

"The first sighting ever of a "Medusa" or "collector meter" which I want to share so you know what it looks like. The collector meter is the same diameter as the other smart meters (called relay meters) but it rests on a "cuff" so it extends out more**. It contains three antennas instead of two. They call it a "collector" meter because it collects the information from several hundred other smart meters and then transmits that information wirelessly to the utility company. Because it is more "active," it emits even more radiation."**

Aside from the Medusa Meter, regular smart grid requires the utilities microwave radiation pulses meters to actually trespass onto other peoples property in order to reach its destination to the collector or Medusa meter, then the cell tower and ultimately back to the utility. This calls to mind references from "The Clean Air Act" which prohibit this kind of trespassing onto ones property with ones "dirty air emissions" without the property owners express permission. Perhaps the Clean Air Act needs some updating to include deadly microwave radiation.

The Federal government in collusion with the utilities have rendered many properties uninhabitable. *Even if the property owners are currently unaware of the issues of habitability that smart meters and smart grid create within their property, these home owners may see de-valuation of their property depending on if they have a smart meter or if they "opted out" and the utility put a smart meter up on a poll right in front of the "opt out" property in order to retain uninterrupted signal.* ***The utility engorges itself with new smart meter/smart grid fees, rate hikes and opt out fees at the home owners expense.***

Required Disclosures When Selling US real Estate

http://www.nolo.com/legal-encyclopedia/required-disclosures-selling-real-estate-30027.html

"When selling your home, you may be obligated to disclose **problems that could affect the property's value or desirability**. **In most states, it is illegal to fraudulently conceal major physical defects in your property…"**

Smart meters and smart grid clearly create major physical defects within and around the home and neighborhood that has been smart gridded.

Also If a buyer were to have a pace maker or other medical implant, this would be an even more serious situation and cause the seller to lose the sale, or if the buyer were to buy the home, would put the buyers life in very serious jeopardy and potentially expose the seller to legal action for not disclosing his/her new pulsed microwave radiation emitting smart meter, prior to the sale of the home.

29) RECKLESS ENDANGERMENT

RCW 9A.36.050

Reckless Endangerment Law & Legal Definition

http://definitions.uslegal.com/r/reckless-endangerment/
Reckless endangerment is a **crime consisting of acts that create a substantial risk of serious physical injury to another person. The accused person isn't required to intend the resulting or potential harm, but must have acted in a way that showed a disregard for the foreseeable consequences of the actions.** The charge may occur in various contexts, such as, among others, **domestic cases**, car accidents, construction site accidents, **testing sites**, domestic/child abuse situations, and hospital abuse. **State laws and penalties vary, so local laws should be consulted.**

Washington State Law, Reckless endangerment

http://apps.leg.wa.gov/rcw/default.aspx?cite=9A.36.050

(1) **A person is guilty of reckless endangerment when he or she recklessly engages in conduct** not amounting to drive-by shooting but **that creates a substantial risk of death or serious physical injury to another person.**

(2) Reckless endangerment is a gross misdemeanor.

[1997 c 338 § 45; 1989 c 271 § 110; 1975 1st ex.s. c 260 § 9A.36.050.]
The following is an abridged account from one of the plaintiffs in the current lawsuit against Edison for health effects from smart meters.

Edison Meters Suspected In Long Beach Throat Cancer Case

http://stopsmartmeters.org/2013/03/17/edison-meters-suspected-in-long-beach-throat-cancer-case/

"I'm not quite sure of the date when a utility worker from the Corix company came to my house to change my old analog electric meter over to the new smart meter."

"It was not long after that when I started to notice that I had developed a constant ringing in my ears and was always fatigued along with heart palpitations but I couldn't figure out why I might be having these issues. I went and had my hearing tested and was diagnosed with tinnitus."

"The way my computer desk was set up put me directly in front of the smart meter- about 4 feet away from where I would sit most of the time."

"In about May of 2012, after about a month of sitting in front of the smart meter, I noticed on the right side of my neck what looked like a burn. Later my skin looked like it had been cooked. The burn was about 2 inches long by about a half inch wide. Shortly after that I reported it to my doctor at the VA Medical Center and was given Triamcinolone Acetonide Cream to apply. It took close to maybe a month before the burn cleared up but then I started noticing that I was having a problem swallowing pills."

"After several complaints to Edison to remove the meter I was getting quite desperate and feeling quite ill. The last night before they removed it I could not even sleep in my bedroom which was on the same side of the house as the smart meter approximately 15 feet or so from my bed. I ended up sleeping on the floor that night in the living room."

"…I did not want anything to do with smart meters or any Trojan horse replacement meters made up to look like analog meters. I asked the Edison installer several times if this was a true analog replacement meter that was not set up for transmitting or collecting information and his exact words were "well it might send out a ping". I told him if that's the case then it's not a true analog meter like the original meter I had before Corix installed the smart meter. At any rate he installed the replacement meter which was made up to look like an analog meter and left."

"After he left I went on line and did a Google search for the meter the Edison worker had installed and found that it indeed had transmitting and data collecting abilities. Upon discovering that, I was really pissed off that Edison would try to be so deceitful."

"I went online and found a place where I could buy my own legal analog meter and purchased one. I gave Edison fair notice and asked them to come out and remove it or I would replace it with the one I purchased. In addition I also purchased an Electrosmog meter so that I could measure the EMF's coming off all my devices."

"A few days after I sent Edison the letter asking them to remove the Trojan meter which goes by the name of "Landis Gyr + MX Family" at around 9:30 in the evening my ears began ringing really loud. Something told me to check the new Edison meter with my Electrosmog meter and I saw that it was registering for about 20 minutes that the Edison meter was transmitting a signal. The next day I removed the Landis Gyr meter and sent it back to Edison and had an electrician install my replacement meter."

"After that Edison became very hostile and began to threaten that they would turn off my power. They sent out one of their Revenue Protection agents - a Mr. Anthony Medina who **claimed I was stealing electricity because I did not have one of their meters on my house.** The new analog meter that I had installed could be easily read and had been calibrated by the factory but I was told it was not acceptable as far as Edison was concerned. **Mr. Medina wanted to reinstall the same meter that I had sent back to Edison and I told him that I didn't want it. He said that he could get an analog meter that would be a non-transmitting meter but that he would have to drive all the way back to his office in Fullerton to get it. He was back in about 30 minutes with the same meter claiming it was different then the first one. I knew he was lying because there is no way he could drive from my house to Fullerton and back in 30 minutes."**

"Edison left me alone for a few weeks and then I got two more threatening phone calls from a woman at Edison threatening now to turn off my power immediately and also a fine for $250 for tampering with Edison equipment. Shortly after that Mr. Medina came back out and reinstalled the same Landis Gyr + MX meter on my house that I had returned to them. The $250 fine shortly followed which I paid. I was just tired of fighting with them."

"I also wrote a letter complaining to the California Public Utilities Commission about the Trojan meter the Landis Gyr+ MX meter that Edison was forcing me to take and I got a reply back from Ana Montes telling me that Edison was not in the wrong and that the meter was perfectly acceptable as far as the CPUC was concerned."

"…Anyway, when I get home later that evening I was drinking a cup of tea when all of a sudden I spit up what looked like a piece of raw hamburger with blood in it about the

size of quarter. Since it was on a Friday and late in the evening the only thing I could think of was to quickly put the specimen in a small glass jar and freeze it."

"On Tuesday, November 20th I went to the VA Medical Center in Long Beach CA to the ENT department to see a Dr. Ge, where I dropped off the specimen. When I came back for a follow-up visit on 12/12/12 that was when I got the diagnosis that the specimen was cancerous. So the cancer that I have is at the bottom right side of the back of my tongue the same side as the burn on my neck and has to be treated with radiation and chemo because I was told that it's too much of a high risk for complications to do surgery on."

"Well they wanted me to do 35 days of radiation treatments along with one session of Chemo a week. I made it up to day 28 with the radiation before I got sick taking the pain medication which has given me severe constipation. So I have missed my last 2 days of radiation. I will see how I feel next week and try to see if I can complete the treatment. It is really indescribably brutal and there have been a few other patients here who just dropped out because they could not take it."

"After they make a plastic mesh type mask of your head neck and shoulders each treatment they bolt the mask down with you inside of it to the table. The fit is so tight that when they finish you can see the mesh out lines on my face when they are done. They also restrain both of your hands. The treatments are about 10 to 20 minutes long."

"Some other down sides to the radiation treatments that I want to mention is that it totally wiped out my taste buds and the sore throat is unbelievable. Knowing that could be a problem they inserted a stomach tube in me so that I can take nourishment by tube feedings. The tube feeding are 6 cans of a liquid formula called Jevity which give me serious heart burn even after one 8 oz can. At first I was taking all my meals by mouth until the third week of radiation when my taste buds just vanished and everything I would try to eat had no taste at all. No matter what I would eat it all tasted the same like eating dry cardboard. It's not even possible to quench my thirst with a cold glass of water because the water tends to have a chemically, metal after taste to it. It got to the point where I could not even stand the smell of food cooking."

"My salivary glands are also all dried out so my mouth is constantly dry except for when this other gland in my mouth kicks in. I found out there is another gland in the mouth that also makes spit except the spit it makes is a real thick kind of mucous which it over produces to the point where I am constantly spitting it out to keep from choking on it. That routine goes on all day long everyday. Also, not to mention the constant nose bleeds."

EVIDENCE – THOUSANDS of Health Effects Reports to Texas and California PUCs

http://stopsmartgrid.org/evidence/

Please click on the above link for nearly 2,000 reports of health effects from smart meters and smart grid reported to the California CPUC and approx. 700 reports of health effects from smart meters and smart grid.

For **hundreds** of accounts of **heath effects from smart meters**, please see:
Smart Meter Health Complaints

http://emfsafetynetwork.org/?page_id=2292

"2013 We had a Smart Meter installed on our home. I got sick and two weeks ago had a mini-stroke. We took the meter off our home after sending Central Hudson (our utility company) several sets of documents – detailing my illness and then my hospitalization – and they did nothing and did not even respond to our requests. After my stroke, we ordered an analog meter online and replaced their radiating meter. We video taped it and sent their meter back to them with a letter, along with all the other correspondence we had sent (return receipt and notarized).
The following Monday the electric company came to our home, with no notice nor explanation, and physically, right in front of me, cut our electric lines with a huge pair of clippers!"

30) OPT OUTS, A FARCE AT EXPENSE OF PUBLIC HEALTH AND SAFETY

A) Opt Outs Are Extortion
B) Opt Outs Are Discriminatory
C) Opt Outs Are Fraud and Deceit

With opt out fees citizens are being charged for something that they:

a) are not getting what they are paying for
b) should not be paying for it in the first place

c) are already paying for in their bills
d) are still being forced to pay for smart meters through embedded fee in their bills – even though they don't want a smart meter and are not using one
e) are in many cases not going to be able to afford and will have to take a pass on.

Public Utilities Code Section 328-328.2

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=puc&group=00001-01000&file=328-328.2

Code 328.2(b) **"No customer should have to pay separate fees for utilizing services that protect public or customer safety."**

Additionally:

Energy Policy Act of 2005

http://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf

"(14) Time-based metering and communications,-(A) Deadline.
Not later than 18 months after the date of enactment of this paragraph, each electric utility shall **offer** each of its customer classes, **and provide individual customers upon customer request**, a time-based rate schedule, under which the rate charged by the electric utility varies during different time periods and reflects the variance, if any, in the utility's costs of generating and purchasing electricity at the wholesale level."

*Per the Energy and Commerce Policy Act of 2005, the customer was to be **"offered"** a smart meter, **not extorted when refusing one or have their utilities shut off when refusing one**. This is a discrepancy that must be addressed when examining how the utilities were able to cash in on the billions of tax payer cash give away from the federal government. The actions involved in rolling out smart grid were clearly all VIOLATIONS of the bill that enabled the utilities to receive those tax payer funds. Because of this, we believe those funds were gotten through illegal means and should be returned to the US Treasury. Most utilities in the US (Vermont being the only exception) are choosing the tactic of extortion - charging the customer not to invade their privacy or not to harm them with pulsed microwave radiation emitting smart meters. Some customers wealthy enough to afford the "opt out fees" will pay them just to try and save their own health and life, the lives if their children and loved ones. But they are in the end not even getting what they have been extorted for because in most cases they are still being exposed to either their neighbors smart meter or in many cases, a repeater or collector meter is put up where the opt out customer is to "fill the gap" in the grid…in other words, smart grid is blanketed, ubiquitous, pulsed, microwave exposure for*

which in reality, there IS NO ESCAPE and therefore nullifying to a large extent the opt out of the citizens who does not wish to risk life and limb for this physically punishing surveillance program.

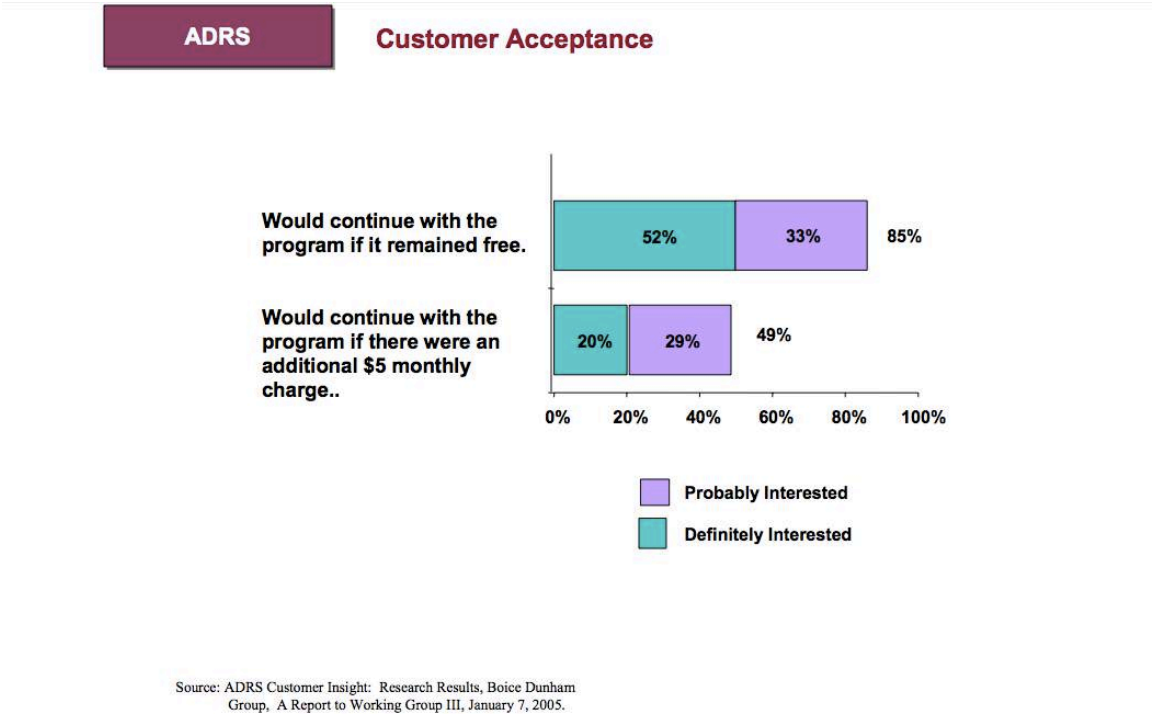
Although having to pay the utility to spare the customers life or health is not only in the category of extortion, but even if the "opt out" customer allows themselves to be extorted (the other option being having their utilities CUT OFF) the utility still does not deliver what the customer has paid for…to not be exposed to the pulsed microwave emissions. Therefore, the act of charging a customer to "not harm or violate them" by "opting out" of what is by law, a voluntary program is illegal and an act of extortion and fraud and deceit as the customer is clearly NOT getting what they are paying for and ***should never have had to pay to retain their Constitutional rights to health, life, liberty and property and privacy in the first place.***

Here is a study that is in the CPUCs possession regarding opt outs and charging customers only a $5.00 fee. This study clearly shows that by even charging and extra $5.00 a month, the customer will not engage in the program.

CPUC AND UTILITIES ARE AWARE 80% OF CUSTOMERS WOULD NOT "OPT OUT" IF CHARGED ONLY $5.00. SO THEY CHARGED $75.00 TO SEAL THE DEAL. See below chart.

Statewide Pricing Pilot Overview and Results

http://www.nwcouncil.org/media/4505/drrc_presentation.pdf



Source: ADRS Customer Insight: Research Results, Boice Dunham Group, A Report to Working Group III, January 7, 2005.

31) DISCRIMINATION

http://www.merriam-webster.com/dictionary/discrimination

"The practice of unfairly treating a person or group of people differently from other people or groups of people."

Charging opt out fees to those who are physically in pain or disabled by smart meters is not just inhumane, it is also ***illegal*** *and* ***discriminatory****. (link to health complaints)*

The poor are also forced to sacrifice health and safety due to the inability for them to pay the "opt out" fees imposed by utilities when customers do not wish to be exposed to carcinogenic microwave emissions from smart meters nor wish to have their privacy invaded.

NV Energy Admits Lying To Customers and Overt Discrimination Against Low Income and Disabled Residents

http://www.national-toxic-encephalopathy-foundation.org/lies.pdf

"NV Energy (NVE) and their contracted installers, Scope Services, have intentionally lied to customers to get them to approve the installation of a smart meter upon their homes."

"Schad Koon, the Director of Customer Service, in 2011, told customers that if they did not accept the smart meter, which was federally mandated they would be denied service. This was reiterated and reaffirmed by Peter Easler, Director of Deployment."

"At a 2012, Nevada Public Utilities (PUC) hearing, Koon, admitted to them, that there was no federal mandate to install the meters. During the same PUC meeting, Koon went on the record stating that NVE would not allow any financial assistance to low income customers who wanted to opt out of the smart meter program."

There are countless stories similar to the above example with Nevada Energy

State regulators reveal 'opt-out' plan for PG&E SmartMeters

http://www.mercurynews.com/ci_19394080
"The proposed fees outrage PG&E customers like Liz Keogh of Bakersfield. Keogh, 68, is a retired social worker who carefully monitors her electric use and had concerns about the accuracy of her SmartMeter. But she complains **she can't afford to opt out."**
"I don't think a whole lot of people will opt out," Keogh said. "There will be pockets of people in the Bay Area who will take advantage of it, but who can afford it?"

Business Owners Discriminated Against with Wanton Disregard for Health, Life, Privacy and Property Rights

http://www.ratical.org/corporations/SCvSPR1886.html

"In 1886, . . . in the case of *Santa Clara County v. Southern Pacific Railroad Company*, the U.S. Supreme Court decided that **a private corporation is a person and entitled to the legal rights and protections the Constitutions affords to any person."**

Edison's official "opt out" policy is different for businesses than it is for residents. Business owners may NOT opt out of receiving a smart meter whereas a resident may. *Since corporations are people in the eyes of the law, Edison is in violation of the law and again, taking the law into their own hands and doing whatever necessary to receive the freely*

given citizen tax money from the federal government, based on smart meter territory penetration level.

Further, to charge those with electromagnetic radiation sensitivities or other health ailments, to retain their health is also in the category of extortion. Also, being that most utility companies received federal funding, this is in direct violation of the ADA…

32) SMART METERS AND SMART GRID VIOLATE CITY AND COUNTY FRANCHISE AGREEMENTS

Most utilities have franchise agreements with the city or county in which they operate. ***Smart meters and smart grid inherently violate these franchise agreements as they have not been given permission by the city or county to blanket entire neighborhoods let alone homes, with continuous, pulsed, RF microwave radiation****.*

Below is a sample franchise agreement from LA County for the Gas Co.

"Section 1. The right, privilege, and franchise is hereby granted to the Southern California Gas Company, a company organized and existing under and by virtue of the laws of the state of California, to lay, construct, erect, install, operate, maintain, use, repair, replace, and remove pipes, pipe lines, mains, services, traps, vents, vaults, manholes, meters, gauges, regulators, valves, conduits, attachments, and other appurtenances for transmitting and distributing gas…"

In the case with smart meters and smart grid, they are transmitting and distributing not just gas, but also RF microwave radiation. Nowhere in the franchise agreement did it permit for the distribution of this toxin.

Additionally, by virtue of how the smart grid and smart meters operate, the utilities have further emboldened themselves to ***add invasive spying to the list of "easements" they are giving themselves with the deployment and installation of this metering system. Spying or surveillance is also clearly not included in the franchise agreement for delivering utilities to the public.***

33) UTILITIES CLAIM IMPLIED CONSENT BUT IMPLIED CONSENT IS NON EXISTENT

IMPLIED CONSENT

http://dictionary.law.com/Default.aspx?selected=904

"n. Consent when surrounding circumstances exist which would lead a reasonable person to believe that this consent had been given, although no direct, express or explicit words of agreement had been uttered."

A reasonable person would not wish to expose themselves to the inherent problems that smart meters bring. They cannot give their implied consent because that would mean they had also been INFORMED of all the "benefits" mentioned in this paper, inherent to smart meters and smart grid, which of course they were not. Utilities are consistently failing to inform customers of:

a) Potential health risk or even that there is currently legal controversy over potential heath risk in regards to RF radiation exposure as emitted by smart meters/smart grid.
b) That the SMPS (switching mode power supply) creates dirty electricity – a known carcinogen, throughout households and entire neighborhoods where smart grid is deployed.
c) That they are aware the meters pose a potential fire hazard.
d) That over billing has been a consistent part of the legacy of smart meters.
e) That the citizen's information may be both hacked by intruders, given or sold to other industries and/or law enforcement to do with what they will.
f) That they are not being justly compensated for use of their property as a relay station for utility's smart grid networks.

Implied consent is 100% nonexistent in regards to every single one of the above smart grid scenarios.

34) EXTORTION AND VIOLATION OF HUMAN RIGHTS AND PROPERTY RIGHTS

A violation of 2404 HOBBS ACT UNDER COLOR OF OFFICIAL and an act of extortion:

2404 Hobbs Act – Under Color of Official Right

http://www.justice.gov/usao/eousa/foia_reading_room/usam/title9/crm02404.htm

"In addition to the "wrongful use of actual or threatened force, violence, or fear," the Hobbs Act (18 U.S.C. § 1951) defines extortion in terms of **"the obtaining of property from another, with his consent . . . under color of official right."**

EXTORTION

http://legal-dictionary.thefreedictionary.com/extortion

"The obtaining of property from another induced by wrongful use of actual or threatened force, violence, or fear, or under color of official right."

Also, utilities are rendering entire sections of homes unlivable due to smart meter radiation exposure. This would be considered to be a "taking" of property by the utility for their use of smart grid.

Utilities are threatening to cut off service and actually HAVE cut off service and even ARRESTED citizens not wishing to be exposed to carcinogenic microwave emissions from smart meters nor those who wish to have their privacy left intact, unless they are paid a premium opt out fee plus a monthly "protection" fee.

Some mothers in Naperville, Illinois did not want their children being exposed to the microwave radiation, so they refused a smart meter: They were arrested on their own property simply for refusing the meters in order to protect their children.

http://www.youtube.com/watch?v=4qBz-rXcF6c

Naperville Reacts

http://www.youtube.com/watch?v=Ltzcw70Iujg

35) MILITARY USE OF EMR (ELECTROMAGNETIC RADIATION) AS WEAPONRY – US FEDERAL GOVERNMENT HAS FULL KNOWLEDGE OF HEALTH EFFECTS RF MICROWAVE RADIATION

Jerry Flynn - Retired Captain, Canadian Armed Forces (ex-Royal Canadian Navy) Canadian National Defense Headquarters, Electronics Warfare Office in the Directorate of Electronic Warfare

http://www.bcuc.com/Documents/Proceedings/2012/DOC_32964_E-65_09-29-2012-Janko-Letter-of-Comment.pdf

Letter by Jerry Flynn
re FortisBC AMI CPCN,
Project No. 3698682 -
CEC Clarification Comments on Community Input Sessions
From: Jerry Flynn
Date: September 21, 2012
To: Commission.Secretary@bcuc.com
Subject: FortisBC AMI CPCN, Project No. 3698682 - CEC Clarification Comments on Community Input Sessions

"**I personally have a long military background much of it spent in SIGINT (signals intelligence) and EW(electronic warfare), including two years in Canada's National Defense Headquarters, where I served as an Electronics Warfare Officer in the Directorate of Electronic Warfare for two years. I have an entirely different and a very real appreciation for the undeniable dangers that accrue from any pulsed wireless EMR-emitting technology, including those which electric utilities and the telecom industry continue to impose on our uninformed, unsuspecting and unprotected society."**

"Certainly, within the military intelligence community, at least, it has long been known that both the former U.S.S.R. and the U.S. militaries have experimented for more than 60 years - **and continue to do so - with the non-thermal low-intensity, long term effects of pulsed microwave EMR on humans!"**

"It is further known that both Russia and the U.S. have developed an arsenal of microwave weapons capable of disabling, maiming and even killing humans ... plus they have pulsed microwave weapons capable of mind control. Of the specific frequencies the Soviet's in particular experimented with and whose lethality they now fully understand one stands out: 2.4 GHz! as this is the very same frequency used in today's wi-fi routers, DECT phones and the ZigBee radios inside every Smart Meter."

"Significantly, too, **the Soviets' effective radiated power (ERP) was estimated to be lower than that currently permitted by both Health Canada's or the FCC's "Guidelines"!** History has been written; **the de-classified government documents are there to be seen; the Internet is full of evidence, which is unassailable. No informed person can question that microwave weapons exist or that the long term, low intensity EMR emitted by pulsed microwave devices are injurious to not just humans but to all life forms.**"

By Jerry Flynn: Wireless Technology, The Worst Threat To Health, Personal Privacy, Democracy and National Security, In Canada's Entire History

http://thepeoplesinitiative.org/wp/wp-content/uploads/2014/01/Jerry-Flynn-Paper.pdf

There are too many quotes and incredibly harrowing facts about this radiation to list them all here. Please just upload the Power Point Presentation and read in its entirety.

"Western Alliance" countries (U.K., Canada, Australia and New Zealand) led by a corrupt U.S. government/military/industrial complex, are aggressively pushing wireless technology globally for military purposes and for unprecedented economic gain."

"Russia has systematically studied electromagnetic bio-effects on all life forms: plants, animals & people since 1933 found harmful effects from even the weakest radiation intensities - depended greatly on frequency used and cumulative effect. Caused the Russians to drastically reduce their own safety levels by a factor of 1,000!"

"1956–US Dept. of Defense (DOD) Directed the U.S. Army, Navy & Air Force to investigate the biological effects of exposure to Radio frequency / Microwave (RF/MW) radiation. In 1957 they reported many implications: serious damage to the eye, evidence it can cause cancer, damage to major organs and disruption of important biological processes. Pulsed radiation appears to be more harmful than non-pulsed radiation."

"The safe exposure limit set for the general public in Czechoslovakia was in the range of 1 µW/cm2 - a thousand times lower than that in the United States (10 mW/cm²)!" http://www.i-sis.org.uk/FOI3.php

Eldon Byrd, a scientist for the Naval Surface Weapons Centre, USN, said about M/W radiation in 1986: 'We can alter the behavior of tissues, cells, organs and whole organisms.... you can cause up to six times higher Fetus mortality and birth defects in

laboratory animals, and it is known how to induce malignant diseases in human cells ... and how to cure them...”

http://www.youtube.com/watch?v=xehJzyttZr8

Utility Sale Whistle Blower Speaks

http://www.castanet.net/news/Kelowna/81081/Utility-sale-whistle-blower=

“The increase in the spread of wireless (technology) is consistent with the spread of all these diseases…the linkage is undeniable. ”

Flynn points to the Moscow embassy incident in 1976 when Soviet officials admitted beaming microwave weapons at the American embassy. Dozens of U.S. officials working in the embassy successively died or suffered from similar cancers.

Here are some enormous files on the work of Dr. Zory Glaser from the US military on microwave weaponry and their effects:

http://www.magdahavas.com/category/from-zorys-archive/

http://www.magdahavas.com/pick-of-the-week-19-index-of-publications-on-biological-effects-of-electromagnetic-radiation-0-1-00-ghz/

ABSTRACT
Considerable research effort has been made into the biological effects of electromagnetic radiation over the frequency range of 0-100 GHz. This work intensified since 1966 when occupational exposure guidelines were made by the American Standards Institute – C95.9. During this period and especially in the last several years it has become clear that a cumulative bibliography of peer reviewed publications reporting this research was needed.

“This publication lists 3,627 articles published in world literature dealing with the biological effects of electromagnetic radiation over the frequency range of 0-100 GHz. The contents have been compiled from the data bases of the U.S. Environmental Protection Agency and the Navy Department. The bibliography covers the published work that was available to March 1980.”

Barrie Trower, retired British military intelligence expert in microwave weapons:

http://tinyurl.com/kfcjt7u

https://www.youtube.com/watch?v=z99_SzoXZdY

Declaration, Civil Action No. Cv-739-MO, Alexandra Helene Morrison and David Mark Morrison v. Portland Public Schools

http://www.stetzerizerus.com/research/Microwaves%20and%20Children%20at%20School%20-%20Barrie%20Trower%20Testimony.pdf

“Debriefing spies during The Cold War extended my military education into the full diversity of stealth microwave warfare and communication systems. In so doing, I learned a list of approximately 30 pulse frequencies that could induce some 50 physical and mental ailments by entrainment. “

Declaration of Barrie Trower
Shawn E. Abrell, WSBA No. 41054,
Pro Hac Vice 3405 NW 31st
Circle, Camas, Washington 98607
Tel.: 503.512.7712; Fax: 503.222.0693
E-Mail: shawn.e.abrell@gmail.com
Lead Counsel for Plaintiffs
Tyl W. Bakker, OSB No. 90200
621 SW Alder, Suite 621, Portland, Oregon 97205
Tel.: 503.244.4157; Fax: 503.220.1913
E-Mail: twbpc@pcez.com
Local Counsel for Plaintiffs
United States District Court
District of Oregon
Portland Division
Alexandra Helene Morrison, by and through her Guardian ad litem and father, David Mark Morrison, and David Mark Morrison, individually,v.Portland Public Schools, Defendant.
Civil Action No. Cv-739-MO

Declaration of Barrie Trower

I, Barrie Trower, under penalty of perjury pursuant to 28 U.S.C. § 1746, hereby make the following declaration in support of a preliminary and permanent injunction enjoining Portland Public Schools' use of WI-FI:

1.I trained at the Government (Ministry of Defense) microwave warfare establishment(s) early in the 1960s covering all aspects of microwave technology, uses and health dangers. Later works included under water bomb-disposal which incorporated microwave technology.

2.In the late 1960's and 1970's a part of my task was to extract confidential (hitherto secret) information from master criminals, terrorists, and spies. This included Cold War microwave technology.

3.My first degree is in Physics with a specialization in microwaves. My second degree is a research degree. I have a teaching diploma in human physiology. Before retiring, I taught advanced physics and mathematics at South Dartmoor College.

4.I am Scientific Advisor to the Radiation Research Trust and the H.E.S.E.
(Human Ecological Social Economical) Project.

5.I am the author of both Tetra Reports for the Police Federation of England and Wales and the Public and Commercial Service Union.

6.My work is done entirely free of charge and I have never accepted money from any person or organization in the years I have been doing this research. I consider myself absolutely independent.

Origins

7. To my knowledge, 'microwave or radiowave sickness' was first reported in August 1932 with the symptoms of: severe tiredness, fatigue, fitful sleep, headaches, intolerability and high susceptibility to infection. Hecht, K et al.,
Overloading of Towns and Cities with Radio Transmitters (Cellular Transmitter): a hazard for the human health and a disturbance of ecoethics, International Research Centre of Healthy Ecological Technology (IRCHET), Berlin-Germany, at l ¶ 3 (2007). These symptoms were reported to be from athermal effects.

8. By 1971, the US Naval Medical Research Institute (NMRI) referenced 2300 research articles listing in excess of 120 illnesses attributed to radio frequency and non-ionizing microwave radiation. Biography of Reported Biological Phenonomena ('Effect') and Clinical Manifestations Attributed to Microwave and Radio-Frequency Radiation, Research Report. MF12.524.015-0004B, Report No. 2. NMRI, National Naval Medical Centre (1971). Under the Freedom of Information Act, extracts from published US Defense Intelligence Agency Documents confirmed the NMRI research and stated: 'If the more advanced nations of the

West are strict in enforcement of stringent exposure standards, there could be unfavorable effects on industrial output and military functions.' Defense Intelligence Agency Documents: DST - 1810S - 076-76, ST-c5-01-169-72, DST-18105-074-76 (1972-1983).

9. In 1975, after an extensive study, the United States Defense Intelligence Agency warned all of its personnel of the risk from low level microwaves including illnesses ranging from microwave sickness (flu like symptoms, depression, suicidal tendencies) to cancers and leukemia. Biological effects of electromagnetic radiation (radio waves and microwaves) – Eurasian Communist Countries, Defense Intelligence Agency: DST-1810S-074-76, March (1976).

10. During the Cold War, the Russian Embassy microwaved the United States Embassy in Moscow with low level microwaves for many years from across the road; why and how is outside the scope of this Declaration. After many changes of staff for multiple cancers / leukemia's and other illnesses to both male and female employees and their children, the late John R. Goldsmith, M.D., was invited to investigate this matter. His investigative report on this incident showed that continuous long term low level microwaves were responsible for those illnesses. Goldsmith, J. R., Radiofrequency Epidemiology, Environmental Health Perspectives,
Vol 105, at 1585, Supp 6, Table 8, Dec (1997). Dr. Goldsmith held 11 Professorships and was the World Health Organization (WHO) representative for Europe. Interestingly the power of the microwaves used by the Russians in some cases was less that the power used by modern day transmitters. Dr. Goldsworthy, http://www.radiationresearch.org/goldsworthy_bio_weak_em_07.pdf; Warning on health and fertility, http://omega.twoday.net/stories/1755556/.

11. Debriefing spies during The Cold War extended my military education into the full diversity of stealth microwave warfare and communication systems. In so doing, I learned a list of approximately 30 pulse frequencies that could induce some 50 mental and physical ailments by entrainment.

12. As soon as ordinary microwave transmitters became common place residents started to complain of illnesses and cancer clusters. Independent researcher Sue Webster took data from just 19 transmitters and found approx 92 cancers (breast, thyroid, bowel, leukemia) the average age of those affected was roughly 39. Health Dangers from Wireless Laptops, Sue Webster was quoted in Canceractive's ICON magazine in January 2003 article,

http://www.canceractive.com/shop/product.php?productid=16157&cat=255&page=1.

13. Microwave sickness was well documented by 1997 where over 100 further research documents were referenced. Grant, L., Microwave Sickness, Electrical Sensitivity News, Vol I No 6, Vol 2 Nos 1-4 (1997).

14. Portland Public Schools is transmitting electromagnetic frequencies (EMFs) at low levels (2.5 GHz to 5 GHz frequency that means between 2.4 and 5.8 billion Hz). When I realized that similar frequencies and powers that were used as weapons during the Cold War were being used as WI-FI in schools, I decided to come out of retirement and travel around the world free of charge and explain exactly what the problem is going to be in the future.

15. HAARP was originally researched by Sister Dr. Rosalie Bertell who was concerned about electromagnetic interference to our atmosphere. HAARP reflects electromagnetic waves off the ionosphere and can influence any part of the air or land on this Planet. This has the potential to cause physiological and neurological effects on humans, animals and plants.

16. The paradox of course is how can microwave radiation be used as a weapon to cause illness or death and at the same time be used as a safe communications instrument. Therefore, I fail to see how WI-FI can possibly be safe for the school children and teachers exposed to it. Also, why is there a still an on-going stealth microwave warfare industry, continuing from the 1950's.

Technology

17.The International Commission for Non-Ionizing Radiation (ICNIRP) classifies microwaves as electromagnetic waves from 300 MHz to 300 GHz. ICNIRP Guidelines, Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (Up to 300 GHz), Health Physics April 1998, Vol 74, No 4, 522, www.icnirp.de/documents/emfgdl.pdf. Therefore, everything discussed in this report is in the microwave 'band.'

18.Microwaves react very differently in our water-based bodies to radio waves. The term 'Radio Frequency' is often used to describe microwave based communication systems. It is important that the term 'Radio Frequency' is not associated with Radio Waves, but associated with microwaves. Microwaves are the preferred medium for communication, over radiowaves, due to their superior penetrative properties
.
19.What is all this really about? Imagine the field around a magnet and imagine ordinary everyday static electricity. If you put the force field from the magnet with the force field from the static electricity you make a wave. This wave is called an electromagnetic wave. There are lots of different types of electromagnetic waves but they are all made of the same two things, magnetic and static fields. The main difference between these waves is their wavelength or the length of the wave hence the number of waves that can be produced per second, i.e. the frequency. All electromagnetic waves are put into a table called the electromagnetic spectrum.

20.At one end of this electromagnetic spectrum you have the very short waves,

namely gamma rays and x-rays, and at the other end of the spectrum you have the very long ways, namely TV and radio. All waves have the same properties. They can be reflected, diffracted, and they all travel at the same speed, which is the speed of light. For interest, if you were one wave of light you would be able to travel around the world nearly seven times every second; that is the speed of light. The electromagnetic spectrum is ordered; starting with the short wave end you have gamma rays, x-rays, ultra-violet, visible light, infra red, microwaves, TV and radio being the longest, in that order. The ultra-violet and above are known as ionizing waves and there is no argument as to the damage they can cause when entering the body. Longer than ultraviolet is said to be non-ionizing and this is where arguments occur between scientists as to whether damage can occur inside the human body through exposure to these waves. The microwaves used in the WI-FI system are in the non-ionizing section of the electromagnetic spectrum and I will be discussing the arguments concerning microwaves and health herein.

Adverse Health Effects

21. There is a plethora of extensive, well-researched documents highlighting illnesses caused by microwave sickness around the world. These papers (in their thousands) highlight the illnesses caused by low level (below thermal) microwaves as: arrhythmia, heart attack, cell death, diseases of the blood, interference to bone marrow, brain tumors, DNA damage, altered calcium level in cells, reduction in night-time melatonin, suppression of the immune system, arthritis, rheumatism, skin problem, lymphatic diseases, vaginal discharge, vascular system disease, tinnitus, leukemia, childhood cancer, sleep problems, mental problems involving depression, irritability, memory loss, difficulty in concentrating, headache, dizziness and fatigue, suicidal tendencies, miscarriage and infertility.

22. It is often argued that these illnesses are psychosomatic. For example, when a neighborhood sees the erection of a transmitter, any illness is instantly blamed on that transmitter. Psychologically the mast is deemed to have caused the illnesses. However, an argument against this are the many cases where disguised, stealth, or concealed transmitters have been erected without local knowledge and similar illnesses still occur.

23. Before I go further, I wish to comment on the telecommunication industry's own research. In February 2007, I was invited to give a short presentation concerning low-level microwave irradiation and cancer at London's Great Ormond Street Hospital for Children. One of the other speakers present was Dr. George Carlo. Sharing the same hotel afforded me the opportunity to engage in several conversations with Dr. Carlo during the two days we were in London. Dr. Carlo explained how he was commissioned by the mobile industry to conduct research on its products. His study (www.health/concerns.org) involved 200 research doctors and 15 epidemiological studies (1993-1999), at a cost of 28.5 million US dollars. 'Our data showed increased risk to children, concerning tumors, genetic damage and other problems,' explained Dr Carlo. He continued, 'my results were suppressed by the telecommunications industry.

24. Further discussion of industry influence is warranted as The University of Berne, Switzerland, published a data synthesis of 59 research studies involving possible ill health from low level microwave irradiation. Concluding, the Department of Social and Preventive Medicine stated: 'Studies funded exclusively by industry reported the largest number of outcomes, but were least likely to report 0 statistically significant result. The interpretation of results * * * should take sponsorship into account.' Huss, A. et al., Source of Funding and Results of Studies of Health effects of Mobile Phone Use: Systematic Review of experimental Studies, (2006), University of Berne, Finkenhubelweg II, Switzerland (egger@ispm.unibe.ch).

25. Moreover, the 'Journal of Industrial Medicine' published its concern over industrial affiliation being concealed by research scientists; suggesting biases from conflicting interests in risk assessments cannot be evaluated properly. Hardell, L., et al., Secret Ties to Industry and Conflicting Interests in Cancer Research, American Journal of Industrial Medicine, at l, May (2006), [Wiley-Liss Inc.]; www.interscience.wiley.com; Dept of Oncology, University Hospital, Orebro University, Sweden.. Examples of these problems from Sweden, the United Kingdom and the United States are presented.

26. Notwithstanding industry's attempts to influence research, even their own studies continued to find adverse health effects. One example is a worldwide epidemiological study (commissioned by T-Mobile, on its own product) that concluded, 'On the cellular level, a multitude of studies found the type of damage from high frequency electromagnetic fields which is important for cancer initiation and cancer promotion.' Mobile Telecommunications and Health, ECOLOG Institute, Sec 7, April (2000) (mailbox@ecolog-institut.de). This document also describes DNA damage on the same page.

27. Nearer in time, following a spate of illnesses in their surgeries, On October 9, 2002, a group of doctors produced the Freiburger Appeal. http://omega.twoday.net/stories/555926/, scroll down for cluster listing. Initially signed by 270 medical consultants, scientists, GPs, MPs and physicians, it now has many thousands of Signatories worldwide. It is a warning to decision makers concerning illnesses from low level microwaves. This appeal lists 13 severe chronic illnesses and various disorders involving: behavior, blood, heart, cancers, migraines, tinnitus, susceptibility to infections and sleeplessness, all ascribed to: 'pulsed microwaves from mobile communications technology.' Interdisziplina re Gesellschaft fur Umweltmedizin e. V.,http://www.esmognrw.denews/skandal/wewelsburg/HESEProject!FreiburgerAppell/ LivelistenderunterschriftensammlungfurdenFreiburgerAppellArztelists.htm.

28. International schools published a list of illnesses amongst staff and students with frightening numbers of cancer clusters/illnesses. Schools and Cell Tower Antennas, (2003), http://members.aol.com/gotemf/emf/schools.htm; www.omega.twoday.net/stories/555926 (47 cancer clusters around schools).

29. Another report (School References (school and cell tower antennas))
from 138 schools dated November 2003, lists miscarriages, brain tumors, cancers, breast cancers and teachers ill within this report. One single school had transmitters on its roof in the Saint-Cyr-l'Ecole quarter of France where eight cases of cancer were confirmed among children in the district.

30. The Stewart Report 2004 asks that anecdotal evidence be taken seriously in the absence of long-term epidemiological studies, concerning illnesses around the area of mobile phone transmitters. Such anecdotal evidence produced July 2002 refers to 92 cases of cancer around just 19 mobile phone transmitters. Other illnesses on the same paper refer to breast cancers, thyroid, bowel and blood problems.

31. In 2007, an international group of scientists studied 2000 peer reviews and published research papers. They recommended an acceptable level of radiation of not more than 0.6 v/m (outdoors) and 0.2 v/m indoors, based on the interaction between low-level microwaves and the cellular processes. This became known as the Bioiniative Level.

32. A project called EU-Reflex or European Union Risk Evaluation of Potential Environmental Hazards from Low Frequency Electromagnetic Field Exposure using sensitive in Vitro Methods shows that cells exposed to cell phone radiation exhibit chromosomal damage well below the exposure guidelines of the WHO.

33. NAILA/WOLF/HUTTER/SANTINI/OBERFELD/BAMBERG etc. All show increased cancers/illnesses from low-level microwave irradiation. A good summary of these studies, with details, can be found on the Radiation Research Trust's website www.radiationresearch.org.

34. The International Association of Fire Fighters opposes the use of fire stations as transmitter sites, because of the health problems of its members. International Association of Fire Fighters, www.iaff.org/safe/content/celltower/celltowerfinal.htm.
35. The world renowned winning Irish Doctors Association listed 70 research papers showing the dangers from low level microwaves, Dr. Santini listed 20 similar studies, the EM Radiation Research Trust listed 9 studies, Dr. Blackwell listed 6 similar studies in his report, and finally 4 international universities completed the Spanish Study, which verified all of these known illnesses. The authors of the Spanish study (The Microwave Syndrome-Further Aspects of a Spanish Study 2004) recommended a level 10 million times below ICNIRP guidelines (discussed below). Dr. Gerd Oberfeld, one of the authors of the study, is the Director of the Public Health Office in Salzburg, Austria, which lowered its precautionary value for indoor exposures to GSM frequencies to comply with the recommendation made by the study. See: http://www.ideaireland.org/emrresearch.htm; Santini paper (2006): http://nextup.org/pdf/Roger_SANTINI_Scientific_arguments_to_prove_application_of_precaution_principle_mobil_phone.pdf, Dr. Grahame - Six studies showing ill effect: http://www.starweave.com/

masts/; The Microwave Syndrome Further Aspects of a Spanish Study: http://www.hese-project.org/hese-uk/en/papers/navarro_n%20045%20_p353%20-%20p358_.pdf.

36. Listing and referencing all such epidemiological studies would be too extensive and repetitive for this article; suffice to say, by 2006, it was reported that 80 percent of the epidemiological studies on the WHO database lists illnesses from microwave sickness to a fourfold increase in cancers from low level microwaves. Guilmot, Jean-luc., WHO EMF Database, Watch - Understand - Act 26, Sept (2006), www.001be.cx. I was curious to investigate the remaining 20 percent that showed no symptoms. However, this had already been looked at by Swiss scientists who said 'the interpretation of results * * * should take sponsorship into account.' By that time, Michael Meacher, Minister for the Environment 1997-2003 (United Kingdom), had published a report blaming some universities for accepting lucrative contracts in favour of reporting favourable results from scientific research. In the same month, United States Congressman Henry Waxman published a similar report in Scientific American stating that science was being corrupted by industry. http://www.next-up.org/pdf/OpenLetterWHODrvanDeventer.pdf; Swiss Study on funding sources; http://www.ehponline.org/docs/2006/9149/abstract.html; Michael Meacher quote, http://www.epolitix.com/EN/MPWebsites/Michael+Meacher/c8afdecc-b15e-41ad-b9cf-25354790d2dc.htm, also published in The Times, May (2004); Henry Waxman in The Scientific American, http://www.sciam.com/article.cfm?articleID=0000FF81-A7DD-1084-A73E83414B7F0000 (May 2004).

37. Likewise, the WHO's Guidelines are based on the short-term effects of this radiation. No long-term experiments have been done in terms of safety levels.

Current Regulations and Thermal Heating

38.It is a serious thing, even low levels of microwave radiation I Emphasis supplied.

39. Advancement in microwave technology since the Cold War necessitated concurrent experimentation. Thousands of research studies exist concerning ill effects from low level, below thermal irradiation levels, involving almost every organ in the body. Possibly the most comprehensive explanation for this phenomenon is written by Dr. A. Goldsworthy of Imperial College London: The biological effects of weak electromagnetic fields (2007), http:tinyurl.com/2nfujj; also: a.goldsworthy@imperial.acuk.

40. The safety levels set by ICNIRP and the National Radiological Protection Board (NRPB), and which are followed by the United States, are the highest in the world. Being thermally based (no account whatsoever is given to the effect of the electric and magnetic of the wave interacting with the physiology of the body) it is very unlikely, if not impossible for any person to receive the take exception to arguments suggesting that weak, low intensity EMF cannot interact with tissue. There are plausible mechanistic explanations for EMF induced

effects that occur below present ICNRP guidelines and exposure recommendations by the EU.

46. A confidential note (document number DST-1810S-074-76) to its military personnel in March 1976, states, 'personnel exposed to microwave radiation below thermal effects experience more neurological, cardio-vascular and haemodynamic disturbances than do their unexposed counterparts.' This document from the United States Defense Intelligence Agency continues to warn personnel of headache, fatigue, dizziness, menstrual disorders, sleeplessness, depression, anxiety and so on.

47. Professor Adey, a Fellow of the American Academy of Scientists and a distinguished visitor of the Royal Society of Medicine said 'of his own research in parallel with similar studies in Russia in the early 1980's showed that radio frequency and the lower microwave range affected enzyme systems that regulate growth and division of white blood cells.

48. Clearly there is experts' world opinion both military and from Universities showing that radiation below thermal effects can impinge on our physiological functions.

49. In its 2009 report, the ICNRP writes: "Another gap in the research is children. No study population to date has included children * * *." ICNRP, ICNRP Statement on the "Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (Up to 300 GHz.), Health Physics, Vol 97, No 3, at 257, Sept (2009). No matter the level of radiation in the room, there is no safety level for microwave radiation for children.

50. Further, It should be noted that whilst professional bodies have noticed the effects of pulsed microwaves on the physiology of the body, no experiments have been done to determine the safety levels from the pulsed microwaves exhibited by all microwave communication systems,

56. Transmissions can be increased, by possibly up to 40 percent, with side lobe technology. Vector mathematics can demonstrate whether any of these transmissions are incident upon another transmitted wave such as a low frequency radio wave, as there can be a piggy-back effect (constructive interference). It is argued (Curry, Dr. BP, Amplification of the Radiation from two Collated Cellular System Antennas by the Ground Wave of and AM Broadcast Station, (undated), BPCurry@MCS.com) that this amplification of electromagnetic signal can pose a health risk for those in close proximity to a transmitter.

57. The Health Council of the Netherlands Radio Frequency Radiation Committee say in their 200 page 1997 report, concerning frequencies of 300 Hz to 300 GHz: 'The experimental data indicate that the effects of EM fields occur at lower power densities when the object is exposed to pulsed electromagnetic fields.' In other words, you will get illnesses quicker if the microwaves are pulsed. Health Council of the Netherlands: Radiofrequency Radiation Committee, Radiofrequente elektromagnetische velden (300 Hz – 300 GHz), at 134 (1997).

58. Professor Salford at Lund University in Sweden has shown in his work in the year 2000 that pulsing can alter the permeability of the blood/brain barrier in rats. If occurring in humans, this could have profound effects on brain function.

59. The Freiburger Appeal (2002) signed by approximately 2,000 doctors and scientists says ‘One can no longer evade these pulsed microwaves. They heighten the risk of already present chemical/physical influences, stress the body's immune system and can bring the body's still functioning regulatory mechanisms to a halt. Pregnant women, children, adolescents, elderly and sick people are especially at risk.’

60. Assimilating knowledge from the Cold War and other sources, I accumulated a plethora of data describing how pulsed / modulated microwaves interfere with our cellular biochemistry. Believing the communications industry to be spiraling out of control with its new innovations, I published my list on the internet (The Communications Industry is in the position where it is spiraling out of any person's ability to control it, An open letter from Barrie Trower (undated); http://omega.twoday.net/search?qBarry+Trower; http://www.mastsanity.org), in the hope that the industry would take note.

Children

61. I find Portland Public School’s decision to install WI-FI in conflict with its decision against (see Correspondence, Patrick Wolfe, Complaint Ex. B) installing any cell mast technology on its buildings when a classroom of computers could exceed the power from an ordinary mobile phone transmitter. It is a common misconception that as WI-FI uses a small transmitter, such a low dose of radiation must be harmless (see further discussion below, ¶ 75-80). As shown earlier there are now many studies showing illnesses from these transmitters, and this is confirmed by the WHO.

62. What should be happening is you should be measuring the amount of radiation in the room to determine if it is safe for children. However, I can tell you without looking that it is not. Because unlike medication, where there is an adult dose and a children’s dose, there is no safety level for microwave radiation for children, not one. My position as scientific advisor requires that I read and translate papers from all around the world, and, I have never, ever, no matter which country I lecture in, which paper I have read, I have never seen a single scientist brave enough to submit for peer review a safety level of microwave radiation for a child or embryo. There is not one that exists.

63. Children are particularly susceptible to microwaves, they do not have our immune systems, and they are not developed. As well, their skulls are thin and their bones (which are producing stem cells that make their immune systems and all other parts of their bodies) are soft allowing the microwaves to penetrate very easily (Cherry (1998),

http://www.emfguru.org/EMF/genotoxic/Genotoxic-EMR-paper.htm, scroll down to figure 45,
(there is research to show that stem cells, in the bone marrow can absorb microwaves)). Finally, they act like antennas and absorb more radiation than adults because they are smaller, they are nearer the wavelength.

64. Children are not small adults. Children are physiologically and neurologically immature; their systems have not yet formed. Microwave radiation alters the blood brain barrier so toxins leak into the brain, which can cause psychiatric problems amongst many other problems. Auditory hallucinations that make people think they are hearing sounds, difficulty concentrating, sleeplessness and irritability are among the symptoms of blood brain barrier damage. Likewise, a child's immune system, which fights off infection, takes 18 years to develop. Additionally 122 layers of protein insulate the electrically generated signals used by the nervous system to control muscles and organs. These layers of protein take 22 years to develop: microwave radiation has been shown to affect protein synthesis. This could lead to muscular dystrophy like symptoms in later life.

65. I have always predicted that any school which allows itself to be 'bathed' in microwaves from whatever source will see its sicknesses rise and behavior fall. I have received many phone calls to confirm this. In all of the schools I have visited around the world with WI-FI, every one has reported the same symptoms in students: fatigue, headaches, nausea, chest pain, vision problems. I argue that you could experience psychiatric problems, increase in aggression and other bad behaviour, as well as reduced immune systems, leading to more colds, coughs, longer colds, longer coughs, longer illnesses, depression, anxiety, thence, suicidal tendencies or taken to its ultimate – leukemia.

66. Research suggests children and women (females have more complex hormone based systems to be disrupted than males) exhibit more vulnerability to illnesses from irradiation than adult males.

67. The problem with young girls is that microwave irradiation has been shown to damage the genetic structure in their ovaries. Girls are born with all of the eggs they need in their ovaries at birth. They are immature eggs, hence susceptible to damage during growth.

Microwaves are genotoxic(experiments can be linked to children showing low level mobile telephony radiation disrupts the bio-chemistry of follicle cells in a mammalian egg chamber), hence the microwaves irradiation could affect the genetic structure within the eggs. The problem here is that the mitochondrial DNA, the genes inside the ovaries, is irreparable. If you have a little girl who damages, through this mechanism, the genetic structure in one of her eggs and she has a daughter, that daughter will carry that genetic problem, because it is irreparable. And her daughter will carry that genetic problem, because it is irreparable. And every female forever, in that line, will carry that problem in perpetuity, because it is irreparable.

68. I believe the most important research I have read is from Dr. Goldsworthy, The biological effects of weak electromagnetic fields(2007), http:tinyurl.com/2nfuj; also, a.goldsworthy@imperial.ac.uk. Dr. Goldsworthy not only shows the mechanism by which microwaves disrupt cells, but also predicts that a genetically damaged sperm and egg can lead to mutant offspring maybe generations away. If you think of children with these transmitters near their laps, the question must be, 'why take this risk for the sake of a piece of cable and a plug, which could replace WI-FI with no loss of performance?

69. The mechanics of this process is understood as permanent low level microwave exposure induces chronic nitrosative and oxidative stress. Warnke, http://www.heseproject.org/de/emf/WissenschaftForschung/Warnke_Dr.%20rer.%20nat._Ulrich/20050219_VortragDrWarnke.pdf (2005) (in German, English translation in progress). It is known that chronic nitrosative/oxidative stress damages the mitochondria, the "powerhouses" of each cell in the body. Mitochondropathy is at the root of many of today's chronic illnesses, such as MS, Alzheimers, Parkinsons, Fibromyalgia Diabetes, Artherosclerosis and Obesity. Kuklinsli, http://www.kpu-berlin.de/For_Neu_Kuklinski_1_en.html (2004). Even more disturbingly, when chronic nitrosative and oxidative stress is present, irreversible mitochondrial DNA damage will occur sooner or later (see also Kuklinski, http://www.kpuberlin.de/For_Neu_Kuklinski_1_en.html (2004)). The mitochondrial DNA is ten times more susceptible to nitrosative / oxidative stress than the DNA in the cell nucleus. Whilst regular cell DNA has in-built repair mechanisms, mitochondrial DNA is irreparable due to its low histone protein content. The mitochondropathy is therefore irreversibly transmitted to the children by the maternal egg cell causing cumulative irreparable damage to future generations.

70. No matter the level of radiation in the room, there is no safety level for microwave radiation for children.

Electro-sensitivity

71. The World Health Organization (WHO) recognizes and describes electro-sensitivity. Electro-sensitivity is best described rather like a food allergy that can only get worse the more you are exposed to it.

72. In Sweden, it is published that 3.15 percent of its population is medically recognized and registered as being handicapped from electro-sensitivity. This number is comparable in California and it is believed Australia. However, the Irish Doctors Association believe this figure may be as high as 15 percent.

73. Therefore, if this number were compared with the population of the Mount Tabor Middle School, at a minimum, 20 to 90 schoolchildren (out of an approximate enrolment of 600 children) are electro-sensitive and could be at a greater risk of developing neurological and

physiological illnesses. This is not to say that non electro-sensitive children could not also be affected.

Experimentation

74. In 2008, the European Parliament wrote to its 27 countries urging them to ignore WHO guidelines and set exposure limits at lower levels. Ries, European Parliament 2004-2009 Commission on the Environment. Public Health and Food Safety, 2008/2211/INI (translation by www.nexyt-up.org) Editor: Frederique Ries (2008). In response, the WHO (which only began studying microwave radiation effects on children in 2009) stated they will not comment on microwave radiation effects on people until 2015, when it will be able to establish effects on human beings. They are watching people to see how many will become sick. We are being experimented upon.

The Accumulative Dose

75. Professors Sosskind, Provsnitz, Lai, and Cherry and a Russian International Medical Commission have all warned about the cumulative effect of these microwaves.

76. Professor Sosskind and Provsnitz write, ‘an accumulated cellular level damage mechanism is not necessarily related to the intensity but can relate to total dose.’ This is not surprising; a property of the electromagnetic spectrum is that these waves are accumulative. By way of example, if we go out on a cloudy day we can still get sunburned, it just takes longer.

77. In the report Mobile telephones, their base stations and health, from the French Health General Directorate, January (2001), they warn of the cumulative exposure over the lifetime of a child. This body concluded with an interesting sentence stating, ‘biological effects occur at energy levels that do not cause any rise in local temperature.’ As it may be argued that biological effects may not be hazardous, the responsibility for this decision concerning children should lay with the parents, guardians or those in loco-parentis and not the school.

78. Based upon a review of the Mount Tabor WI-FI Floor Plan (Complaint, Ex. A), schoolchildren will be exposed to as much as 30-40 hours per week of constant digitally encoded pulsed WI-FI signals from each wireless device in the child’s vicinity, making the cumulative exposure over a child’s lifetime successively higher.

79. As the amount of WI-FI radiation is accumulative, when reviewing this case, it occurred to me, to compare the relative accumulative dose of WI-FI in the classrooms with a commonly known device that emits the same frequencies. That device is a microwave oven. Both WI-FI and microwave ovens operate at 2.4 GHz. An average WI-FI transmitter operates at 0.2 J/s[0.2 Watts]. Therefore, if using only 20 computer/laptop transmitters in a classroom, there is a combined 4 J/s [4 Watts]. A typical microwave oven (output) is 800 J/s [800 Watts]

(magnetron input equals 1,200 J/s [1,200 Watts]). Therefore, a classroom equals 4 J/s [4 Watts]; a microwave oven 800 J/s [800 Watts]. A ratio of 1:200. Therefore, if WI-FI is used in morning and afternoon sessions, 200 seconds in a classroom (at 4 J/s [4 Watts]) equals 1 second inside a microwave oven (at 800 J/s [800 Watts]); over a school day the equivalent of 2 minutes in a microwave oven; 10 minutes per week.11It should be noted these calculations will vary according to the following factors:i.There can be approximately 13 mathematical variations to wave formulae; ii.The 1/d2rule will apply to distance; iii.The wall transmitter and main transmitter are not included/calculated; iv.Constructive interference patterns are not calculated; v.WI-FI sets and transmitters in nearby classrooms are not included/calculated; andvi.Reflective materials are unknown: i.e. wall insulation. Ideally, a reading will be taken in a classroom with 20 or more fully operational computers and WI-FI transmission devices next to other classrooms (below, above, adjacent, etc.) with 20 or more fully operational transmission devices in each of those rooms.

80. As a final word about accumulative dose, it must be stressed that a long-low dose can be more dangerous than a short-high dose. By way of example, as I wrote in my published paper (Co-written with Scientist Andrea Klein), Wireless Laptops and Their Transmitters Using Microwaves in Schools,http://www.mastsanity.org/wifi/17/154-wireless-laptops-and-their-transmitters-using-microwaves-in-schools-a-report-by-barrie-trower.html, permanent low level microwave exposure can induce chronic nitrosative/oxidative stress; hence damage to mitochondrial DNA.

Conclusion

81. There is a simple solution, use a cable and a plug to deliver the internet, or fiber optic cable.

82. With all of this evidence pointing to mental, physical and long term disorders (cancers ~ mutant newborns), is this honestly worth the risk to our next generations for the sake of just a few meters of wire and a plug. As shown, the dangers of low level, below thermal microwaves, have been known to governments for 50 years. I was educated in microwave technology by the Military (United Kingdom) in the early 1960's, and even then we were instructed of these dangers. Nothing has changed to suddenly make microwaves safe.

83. The evidence for adverse effects of low-level microwave irradiation is currently strong and grows stronger with each new study. Using a cabled internet system does not increase exposure.

84. I ask you, if a drink was reported in the 1950's to cause cancer, countless reports and studies since showed this hypotheses to be correct, and the WHO printed a list of an 80 percent likelihood of illness/cancer from drinking it, which was confirmed by international studies, would you give this to your child to drink, knowing they have their whole lives ahead of them? So what is the difference? It is simple. This product is backed and financed

by the most powerful industry on the planet. An industry that does not have to prove its product is safe (unlike a drug company). You have to prove it is not! Thence take this industry to court with your list of illnesses, cancers, leukemia's, deaths, etc. It seems few are prepared to stand against such a Goliath in defense of our children.

85. Within the relevant scientific community it is generally accepted that that many bioeffects and adverse health effects occur at far lower levels of radiofrequency exposure where no measurable heating occurs; some effects are shown to occur at several hundred thousand times below the existing public safety limits.

86. In my opinion, Portland Public Schools' use of WI-FI is causing and will continue to cause Alexandra Morrison, other students, and school staff and faculty adverse health effects and should be discontinued immediately.

Dated this ____ day of June 2011.
/s/ Barrie Trower
BARRIE TROWER
3 Flowers Meadow
Liverton
Devon, United Kingdom
TQ12 6UP

Barrie Trower, retired British military intelligence expert in microwave weapons:

http://www.stetzerizerus.com/research/MicrowavesandChildrenatSchoolBarrieTrowerTestimony.pdf

https://www.youtube.com/watch?v=z99_SzoXZdY

Dr. Magda Havas – Most Lethal Microwave Frequencies – Pick of the Week

http://www.magdahavas.com/2010/09/06/pick-of-the-week-9-0-95-and-2-45-ghz-most-lethal-microwave-frequencies/ overview

Microwave signaling Smart Meters are a powerful technology with very suppressive properties "deployed" on every building throughout the United States.

The Smart Meter Home Area Network antenna transmits at 2.4 GHz.

A single Smart Meter, at 3 feet, is already an estimated 53-160 times the whole body radiation exposure from a cell phone held to the head. It is emitting a Class 2B carcinogen.

Microwave radiation kills quickly at high doses. This was demonstrated by the Stanford Research Institute study, testing 950 MHz and 2.45 GHz as low as 200,000 microW/cm2 – almost identical to the frequencies used by electric Smart Meters. This study found that 950 MHz, the lowest frequency they tested, was the most lethal.

Mortality In Rats Exposed to CA Microwave Radiation At 0.95, 2.45, 4.45, and 7.44 GHz

http://www.magdahavas.com/wordpress/wp-content/uploads/2010/09/Mortarity_in_Rats_Exposed_to_CW_Microwave_Radiation.pdf

PG&E Smart Meters are capable of 2 ½ watts, which equals 2 ½ million microwatts. Peaks have already been detected at over 20,000 microwatts per cm2. That's 10% of a lethal dose at these frequencies.

Robert Becker:

"Since 1986 the American Walter Reed Army Institute of Research has been working on the development of a new type of microwave weapons. In this research it was found that microwave energy within the range of 1 to 15 GHz enters all organ systems of the body, and that microwave pulses tend to couple with the central nervous system…. (This) constitutes a danger to all organ systems. The test program, which commenced in 1986, dealt with four areas:

1. Effect on immediate debilitation;
2. Immediate stimulation/irritation through acoustic effects;
3. Effects on influencing or prevention of work (activities), and
4. Effect on stimulus-controlled behavior.

In "The Spark of Life", 1991; cited by Wolfgang Volkrodt, **"Are Microwaves faced with a fiasco similar to that experienced by nuclear energy?"** pgs. 7, 9

Electromagnetic weapons helpful in the fight against mass disorders

http://voiceofrussia.com/2012_04_25/72924745/

"Russian military have worked out non-lethal electromagnetic weapons that are presently undergoing tests… **The USA is the leader in this field**, and Russia has become the second state in the world that has started developing electromagnetic weapons."

"Sources in Moscow say Mr. Putin has described the guns, which use electromagnetic radiation like that found in microwave ovens, as 'entirely new instruments for achieving political and strategic goals'. Mr. Putin added: 'Such high-tech weapons systems will be comparable in effect to nuclear weapons, but will be more acceptable in terms of political and military ideology.'

"Experts say that in the 21st century the military-scientific community will work in secret laboratories to develop new types of weapons, including ray, psychophysical, geophysical and wave weapons. Thus, we see that what was fantasy some time ago is becoming a reality today."

Putin targets foes with 'zombie' gun which attack victims' central nervous system

http://www.dailymail.co.uk/news/article-2123415/Putin-targets-foes-zombie-gun-attack-victims-central-nervous-system.html#ixzz1rgW2NZUw

"Mind-bending 'psychotronic' guns that can effectively turn people into zombies have been given the go-ahead by Russian president Vladimir Putin."

"The futuristic weapons – which will attack the central nervous system of their victims – are being developed by the country's scientists."

Mr. Putin added: **'Such high-tech weapons systems will be comparable in effect to nuclear weapons, but will be more acceptable in terms of political and military ideology.'**

"Mr. Serdyukov said: 'The development of weaponry based on new physics principles – direct-energy weapons, geophysical weapons, wave-energy weapons, genetic weapons, psychotronic weapons, and so on – is part of the state arms procurement programme for 2011-2020."

"Research into electromagnetic weapons has been secretly carried out in the US and Russia since the Fifties."

"However, previous research has shown that low-frequency waves or beams can affect brain cells, alter psychological states and make it possible to transmit suggestions and commands directly into someone's thought processes."
"High doses of microwaves can damage the functioning of internal organs, control behaviour or even drive victims to suicide. Anatoly Tsyganok, head of the Military Forecasting Centre in Moscow, said: **'This is a highly serious weapon."**

"Still, we know very little about this weapon and even special forces guys can hardly cope with it.'"

"The long-term effects are not known, but two years ago a former major in the Russian foreign intelligence agency, the GRU, died in Scotland after making claims about such a weapons programme to MI6."

"Sergei Serykh, 43, claimed he was a victim of weapons which he said were 'many times more powerful than in the Matrix films'."

"Mr. Serykh died after falling from a Glasgow tower block with his wife and stepson in March 2010. While his death was assumed to be suicide, his family fear there was foul play."

Electromagnetic Radiation as Powerful as the Atomic Bomb

http://web.archive.org/web/20120629200521/http://mindjustice.org/emr13.htm

This is an ENORMOUS document, LOADED with excellent info on the subject.

A very common complaint after Smart Meter installation is tinnitus or hearing ringing or buzzing. It was discovered in the 1950's that microwave radiation could be "heard," and researchers like Allen Frey worked to discover the mechanism and to see what uses it could be put to. A report for the U.S. Army elaborates some of the possibilities,

Bioeffects of Selected Non Lethal Weapons

http://www.wired.com/images_blogs/dangerroom/files/Bioeffects_of_Selected_Non-Lethal_Weapons.pdf

Incapacitating Effect: Microwave Hearing

"Microwave hearing is a phenomenon, described by human observers, as, the sensations of buzzing, ticking, hissing, or knocking sounds that originate within or immediately behind the head. There is no sound propagating through the air like normal sound."

"… This technology makes use of a phenomenon first described in the literature over 30 years ago. Different types of sounds were heard depending on the particular of the pulse characteristics…..One study (in 1975) using human volunteers, identified the threshold energy of microwave-auditory responses in humans as a function of pulse width for 2450 MHz radiofrequency energy. [Electric HAN network – 2450 MHz]"

Tunability

"The phenomenon is tunable in that the characteristic sounds and intensities of those sounds depend on the characteristics of the RF energy as delivered. …it could only be heard within a person's head. In one experiment, communication of the words from one to ten using "speech modulated" microwave energy was successfully demonstrated. Microphones next to the person experiencing the voice could not pick up the sound. Additional development of this would open up a wide range of possibilities."

Recovery/Safety

"Humans have been subjected to this phenomenon for many years. The energy deposition required to produce this effect is so small that it is not considered hazardous."

Possible Influence on Subject(s)

Application of the microwave hearing technology could facilitate a private message transmission, It may be useful to provide a disruptive condition to a person not aware of the technology. Not only might it be disruptive to the sense of hearing, it could be psychologically devastating if one suddenly heard "voices within one's head."

"Technological Status of Generator/Aiming Device

"This technology requires no extrapolation to estimate its usefulness, Microwave energy can be applied at a distance, and the appropriate technology can be adapted from existing radar units… Signals can be transmitted long distances (hundreds of meters) using current technology."

p. 8-12

"Incapacitating Effect: Disruption of Neural Control

The nature of the incapacitation is a rhythmic-activity synchronization of brain neurons that **disrupts normal cortical control of the corticospinal and corticobulbar pathways; this disrupts normal functioning of the spinal motor neurons which control muscle contraction and body movements. Persons suffering from this condition lose voluntary**

control of their body. This synchronization may be accompanied by a sudden loss of consciousness and intense muscle spasms."

"Mechanism to Reproduce the Desired Effects

Application of electromagnetic pulses is also a conceptual nonlethal technology that **uses electromagnetic energy to induce neural synchrony and disruption of voluntary muscle control**. The effectiveness of this concept has not been demonstrated. However, from past work **in evaluating the potential for electromagnetic pulse generators to affect humans, it is estimated that sufficiently strong internal fields can be generated within the brain to trigger neurons."**

"...The ionic basis and biochemical substrate of this activation have been areas of considerable study but still leaves many questions unanswered. What are the basic cellular properties, present in normal cells and tissues, that could contribute to the generation of abnormal activity? What parts of the system are low threshold and function as trigger elements?"

"Different types of technologies could be employed to influence wide areas or single individuals. Because this technology is considered to be tunable, the influence on subjects could vary from mild disruption of concentration to muscle spasms and loss of consciousness. The subject(s) would have varying degrees of voluntary control depending on the chosen degree of incapacitation."

"Technological Status of Generator/Aiming Device

An electric field strength of roughly 100Kv/m over a time period of 1 nanosecond is approximately the condition thought to be necessary to produce the desired effect when provided to an overall repetition rate of 15 Hz. Such a field may be developed during a radar-like, high-peak-power, pulsed source or an electromagnetic pulse generator operating at 15 Hz. These technologies exist today sufficient to evaluate the disabling concept. Power requirements are not high because the duty factor is so low… Because there were no open literature reports from which to make inferences, there is some uncertainty about the power levels required.

Barrie Trower, former MI6 Microwave Weapons Expert
http://www.youtube.com/watch?feature=player_embedded&v=ZdB-tbzJSrk

More from Barrie Trower
http://www.youtube.com/watch?feature=player_embedded&v=mRLSPWviyzQ

Barrie Trower on Targeting Individuals with Microwave Radiation

http://www.youtube.com/watch?feature=player_embedded&v=09mpvscHiKI

Expert tells doctors of impending tragedy from EMF radiation as health of nations laid waste by technology

http://www.stopthecrime.net/trower%20to%20irish.pdf

"…microwave signals and radiation cause damage to living organisms and the built environment. Furthermore he is living testimony that governments have used that evidence to inflict pain and suffering on their opponents.Trower claims that there is no defense against a microwave assault and that by alternating pleasure and pain frequencies broadcast from a van parked nearby "anyone can be broken in 30 hours."

"…there are 8,300 military papers proving microwaves cause severe neurological and physiological damage."

• TOP SECRET: From a U.S. conference, 1986. "Concerning low level microwaves, we can change behaviour of cells, tissue... Whole organisms have a six times higher fetal mortality rate, birth defects and induce malignant tumours in human cells."

• TOP SECRET: Course No. 11, 2001-07. "Students (scientists) will be familiar with current knowledge, i.e. cancer, memory, brain function damage to the eye, skin, birth defects from low level microwave radiation."

•TOP SECRET: Naval Medical Research Institute: Biological and Clinical Manifestations Attributed to Microwave Radiation (Low-Level)which lists 2,000 medical references with the main paper, Altered Menstrual and Fetal Development.

• TOP SECRET: World Health Organization (W.H.O.), 1973. Biological Effects: Health and Excess Mortality from Artificial Irradiation of Radio Frequency, Microwave Radiation. The paper was the result of a symposium held in Warsaw and has been referred to by experts such as Dr. Magda Havas, Trent University, Canada, Henry Lai, of the University of Washington and by the Seletun Declaration signed by Prof. Olle Johansson, of the Karolinska Institute, among others.

"The damage caused by microwave radiation is irrefutable," says Trower, "There never is any doubt. There never was."

Nonlethal Weapons Could Target Brain, Mimic Schizophrenia

http://www.wired.com/dangerroom/2008/02/report-nonletha/

“Among those discussed are weapons that could disrupt the brain, as well as my longtime obsession, the "Voice of God" device, which creates voices in people’s heads. As the report notes, "Application of the microwave hearing technology could facilitate a private message transmission.”

“Because the frequency of the sound heard is dependent on the pulse characteristics of the RF energy, it seems possible that this technology could be developed to the point where words could be transmitted to be heard like the spoken word, except hat it could only be heard within a person’s head. In one experiment, communication of the words from one to ten using "speech modulated" microwave energy was successfully demonstrated. Microphones next to the person experiencing the voice could not pick up the sound. Additional development of this would open up a wide range of possibilities.”

US Electromagnetic Weapons and Human Rights

http://www.projectcensored.org/wp-content/uploads/2010/05/ElectromegnaticWeapons.pdf

“This research explores **the current capabilities of the US military to use electromagnetic (EMF) devices to harass, intimidate, and kill individuals and the continuing possibilities of violations of human rights by the testing and deployment of these weapons.”**

The above paper is filled with stunning quotes and revelations about the military industrial complex and their desire to control the planet and their ability to do so through microwave weapon technology.

Making people hear voices, making people believe they are schizophrenic, is a powerful capability. Representative Jim Guest of the Missouri Legislature has become an advocate for Americans who presently claim they are being electronically harassed.

In 2006, Project Censored, Sonoma State University, reported on capabilities already in use, including the ***LRAD – Long Range Acoustical Device – a “non-lethal” weapon, that has already been used against demonstrators and that can permanently injure and kill with internally experienced sound, as well as Voice to Skull weapons, “which uses microwave transmission of sound into the skull of persons or animals by way of pulse-modulated microwave radiation.”***

Now with the deployment of smart meter technology in the home of every citizen, personalized microwave targeting becomes much easier as does blanketed microwave targeting of entire populations in addition to the overall microwaving of entire populations.

Microwaving Iraq

*Investigative journalist and veteran William Thomas, in "**Microwaving Iraq,"** describes the use of "poppers" or "domes" which use **multiple frequencies to have specific disruptive physical and psychological effects, but also have unintended effects.***

Microwaving Iraq: 'Pacifying' Rays Pose New Hazards In Iraq, 1-25-2005

"On the rooftop of a shrapnel-pocked building in the ruins of Fallujah, a team of GI's stealthily sets up a gray plastic dome about two-feet in diameter. Keeping well back from the sight lines of the street and nearby buildings, they plug the cable connectors on the side of the "popper" into a power unit. **The grunts have no clue what the device does. They are just following orders."**

"Most of the worker-bees that are placing these do not even know what is inside the "domes" just that they were told where to place them by Intel weenies with usually no nametag," reports my source, a very well informed combat veteran I will call "Hank".

"The grunts call the plastic devices "poppers" or "domes". Once activated, each hidden transmitter emits a widening circle of invisible energy capable of passing through metal, concrete and human skulls up to half a mile away. "They are saturating the area with ULF, VLF and UHF freqs," Hanks says, with equipment derived from US Navy undersea sonar and communications…"

"The "poppers, are capable of using a combo of ULF, VLF, UHF and EHF wavelengths in any combination at the same time, sometimes using one as a carrier wave for the others," Hank explains, in a process called superheterodyning. **The silent frequencies daily sweeping Fallujah and other trouble spots are the same Navy "freqs that drove whales nuts and made them go astray onto beaches."**

"…He is concerned that **innocent Iraqi families and unsuspecting GIs alike are being used as test subjects for a new generation of "psychotronic" weapons using invisible beams across the entire electromagnetic spectrum to selectively alter moods, behavior and bodily processes."**

"According to Hank's front-line buddies, Iraqis exposed to secret beam weapons "get laid back, confused and mellow, and then blast out in a rage, as opposed to our folks going on what could only be called a "bender" and turning into a mean drunk for a while."

"Once they wander away from direct electromagnetic-fire, startled GIs come to their senses. They return to their units, Hank explains, saying, "What was I thinking?"

"…The recovery rate among US troops "seems to be about a day or so, where the locals are not getting over it in less than a week or more on average," Hank has learned."

"While the mobile microwave weapons currently deployed in Iraq may or may not lead to lasting harm, **rooftop "poppers" and "domes" left to radiate for days at a time are irradiating unsuspecting families already coping with illness, wounds, hunger and the stress of losing homes and loved ones..."**

"…Very Low Frequency (VLF) weapons include the dozens of "poppers" currently deployed in Iraq, which can be dialed to or "long wave" frequencies capable of traveling great distances through the ground or intervening structures. As air force Lt Col. Peter L. Hays, Director of the Institute for National Security Studies reveals, **"Transmission of long wavelength sound creates biophysical effects; nausea, loss of bowels, disorientation, vomiting, potential internal organ damage or death may occur."**

"Hays calls VLF weapons "superior" because their directed energy beams do not lose their hurtful properties when traveling through air to tissue. A French weapon radiating at 7 hertz "made the people in range sick for hours."

Measurement by a member of the public has found the electric Smart Meter frequency of 900-928 MHz modulated by an ELF frequency of 11-15 Hz – brainwave range. Nausea, vomiting, dizziness and disorientation are symptoms people experience after Smart Meter installation, as well as sleep disturbance, inability to concentrate, memory problems and mood disorders.

Reports periodically come out in the press about experiments conducted on the general public or on groups in our society by agencies within our own government or the military. Plutonium injections, syphilis experiments, Agent Orange denied and soldiers still denied benefits, Gulf War illness denied and veterans denied benefits, patented genetically engineered "bugs" showing up in the general population, MKULTRA, atomic bomb experiments on soldiers, and on and on. The public usually learns about this decades after the incidents occur and after responsible parties are no longer alive. It is important to bear this in mind, as well as the danger from other nations and groups participating in directed energy development and applications.

Researchers from University of Nevada at Reno, have been working on various applications for the U.S. military.

Non-Lethal Weapons for Use Radiofrequency/Microwave Energy for Stunning/Immobilization

http://www.stormingmedia.us/46/4684/A468405.html

"This basic research initiative is geared ultimately toward developing effective and safe non-lethal technologies that alter skeletal muscle contraction and/or neural functioning via radiofrequency (RF)/microwave (MW) electromagnetic radiation. Major accomplishments included 1) near completion of studies examining the effect of 1 to 6 GHz MW fields on catecholamine release from chromaffin cells; 2) initiating studies using a novel exposure system for real-time imaging of intracellular effects in chromaffin cells in response to high electric field RF/MW pulse modulated radiation, broadband Gaussian pulses or RF/MW modulated Gaussian pulses with the frequency spectrum centered in the band 0.75-6 GHz; 3) completion of studies on the effect of 0.75 to 1 GHz RF fields on skeletal muscle contraction using fixed frequencies and just recently implementing frequency sweep paradigms; 4) initiation of studies to examine the effect of nanosecond electric pulses of high intensity on catecholamine release from chromaffin cells."

Sponsorship by U.S. Air Force

Naval Studies Board on Directed-Energy Non-Lethal Weapon

www.bioinitiative.org (2007)

"The first radiofrequency non-lethal weapons, VMADS, is based on a biophysical susceptibility known empirically for decades. More in-depth health effects studies were launched only after the decision was made to develop that capability as a weapon. The heating action of RF signals is well understood and can be the basis for several additional directed-energy weapons. Leap-ahead non-lethal weapons technologies will probably be based on more subtle human/RF interactions in which **the signal information within the RF exposure causes an effect other than simply heating: for example, stun, seizure, startle and decreased spontaneous activity. Recent developments in the technology are leading to ultrawideband, very high peak power and ultrashort signal capabilities, suggesting the phase space to be explored for subtle, yet potentially effective non-thermal biophysical susceptibilities is vast.** Advances will require a dedicated effort to identify useful susceptibilities."

National Academy of Sciences - National Research Council

An Assessment of Non-Lethal Weapons Science and Technology

by the Naval Studies Board,

Division of Engineering and Physical Sciences (National Academies Press (2002)
(prepublication copy, page 2-13)
Cited in Bioinitiative Report, Section 4, p. 11, 12

“At a foggy military base in Northern California years ago, an experiment was made with frequency to see if the fog could be eliminated. Someone stationed there agreed that frequency is powerful, recalling, “We didn’t get rid of the fog, but we did kill all the wild turkeys.”

“This description of what women protesting at Greenham Common in England experienced:”

“A preview of what lies in store for long-suffering families in Iraq can be gleaned from Greenham Common, where the British Army reportedly used an electromagnetic weapon against 30,000 women who had camped for nearly two decades around that UK military base to protest the deployment of nuclear-tipped US cruise missiles.”

“One day in the summer of 1984, more than 2,000 British troops suddenly pulled back, leaving the fence unguarded. Peace mom Kim Besley recalls that as curious women approached the gate, they **"started experiencing odd health effects: swollen tongues, changed heartbeats, immobility, feelings of terror, pains in the upper body."**

“Besley found her 30-year-old daughter too ill to stand. Other symptoms typical of electromagnetic exposure included skin burns, severe headaches, drowsiness, post-menopausal menstrual bleeding and menstruation at abnormal times. Besley's daughter's cycle changed to 14 days and took a year to return to normal.”

“Two late-term spontaneous miscarriages, impaired speech, and an apparent circulatory failure prompted the women to begin monitoring for a directed-energy beam, Using an EMR meter, they measured beams sweeping their camp at 100-times normal background levels.”

Though utility companies claim aspects like duty cycles are fixed, it is important to note:

CPUC Opt-out decision, 2-9-12, p. 9, #7

“(Smart Meters have) the ability for remote installation of meter or communication board firmware which may be required for upgradability.“

If the meters can be remotely controlled, hacked and “upgraded,” what are the possibilities for damage and harm, beyond what the harm the meters are presently causing? The answer is LIMITLESS. We are already being lied to by the utilities and the federal government with regard to this radiation and nearly every aspect of this roll out. It is sobering to realize how

these devices and this infrastructure could additionally and intentionally bring harm to our communities, even on an individual and targeted basis.

36) FRAUD AND DECIET

http://legal-dictionary.thefreedictionary.com/deceit

"A Misrepresentation *made with the express intention of defrauding someone, which subsequently causes injury to that person."*
"In order for a statement to be deceit, it must be untrue, made with knowledge of its falsity, or made in reckless disregard of the truth. The misrepresentation must be such that it causes harm to another individual."

Burbank Water and Power Smart Grid FAQ

http://www.burbankwaterandpower.com/download/SmartGridFAQ.pdf

"In response to public concerns over the safety of Smart Grid infrastructure, the California Public Utilities Commission instituted an independent study to determine any health risks. The results of that study were that the Smart Grid infrastructure being deployed throughout California does not pose a health risk…"

What BWP does NOT tell it's citizens is that THOUSANDS of studies exist which state smart meters DO in fact cause a very serious health risk, that the CPUC is run by Michael Peevey with an inherent conflict of interest being the ex-president of Edison and having current business dealings with PG@E and has consistently disregarded nearly ALL of the almost 2,000 complaints of health effects from smart meters from the public.

Also, when a customer opts out, they are almost always still being exposed to their neighbors smart meter emissions or other smart grid infrastructure such as the utility wanting to retain signal, so they put a repeater up where the opt out customer is or other smart grid infrastructure so as to have uninterrupted, blanketed RF coverage of the entire area, including the property of the opt out customer.

http://www.lawyers.com/Ask-a-Lawyer/Ask-a-Question.html?msg=confirm&questionid=595666&aopid=841

Message:

I'm in an apartment and have a group of banked smart meters. Me & husband experience ringing in ears. Opted out (radio-off meter is only option). Radio turned off on (1) of the 9 meters. Both still have ringing in ears. I was charged $68 to opt out, but since hasn't produced the desired result (no more ringing in ears), I want my money back."
"I now have an added $10 per month for meter."
"If you aren't laughing by now, consider that before the smart meter program, I did not have to pay a meter reading fee. Now that smart metering is going forward, I now have to pay for something that didn't cost me before."
Currently watching bank-bal go lower, not making the money in part-time work that hoped for, and now have a shutoff notice because the opt-out fees put me over what I normally pay/ mo.

The following was taken directly from the FCCs website in 2010. The FCC has since CHANGED their website to soften the blow of what they were informing consumers about wireless devices and cancer.

Letter of Inquiry FCC

http://www.americanassociationforcellphonesafety.org/uploads/Letter_oF_Inquiry_FCC_Final_7-11-10.doc

"Recent reports by some health and safety interest groups have suggested that wireless device use can be linked to cancer and other illnesses."

"Also, some parties assert that any potential health risks are probably greater for children than for adults."

Also at that time found on the FCC website

In the "kids zone" evidently grades 9-12 were asking the question…

Do cell phones cause brain cancer?

FCC answer… "There is no scientific evidence to date that proves that wireless phone usage can lead to cancer or a variety of other health effects, including headaches, dizziness or memory loss."

"Not only are these statements factually incorrect and misleading to minors, but there are multitudes of studies and evidence to date of all of the above illnesses and health problems and more. Yet the FCC stated none of this in the "kids' zone" section of their website. They do go on to say…"

"…the FDA, which has primary jurisdiction for investigating mobile phone safety, stated that **it did not have enough information at that time to rule out the possibility of risk, but if**

such a risk exists, "it is probably small."

“Clearly, this statement implies there is inherent risk with the cell phone and by omission states that the cell phone has not been proven to be safe.“

“If the risk is “probably small”, does this imply that the FDA and the FCC has no obligation to inform consumers of such a risk even if it is as small as say, 1 in 10 as in cigarette smokers? Quantification of the word “small” is imperative in order for adults to make informed decisions about their usage of wireless devices.”

“This directly contradicts the FCCs other statement on their website that there is no evidence of illness with cell phones. “

“We ask the question, which statement is true? The one from the Kids Zone or the one from the Consumer facts/mobile phone area of the FCC website? **Giving two different answers to the same question is difficult to legally reconcile. CLEARLY there are doubts even in the industry run federal agencies regarding the safety of wireless devices. Not only that, but there is also LEGAL controversy currently in the courts on the issue of wireless devices and health effects.”**

The FCC has since changed their website language, so we are unable to provide the link for the above statements, however if this were to ever go to trial it could easily be proven that these statements were in 2010, on the FCC website for all to see.

37) FRAUD AND MISREPRESENTATION

Fraud and Misrepresentation exist on this issue both at the federal level and at the local utility level. The DOE never made it a mandatory part of smart meter or smart grid deployment, that the federal government or the utilities notify citizens of the following:

a) ***Potential health risk or even that there is currently legal controversy over potential heath risk in regards to RF radiation exposure as emitted by smart metes/smart grid***
b) ***That the SMPS (switching mode power supply) creates dirty electricity throughout entire neighborhoods where smart grid is deployed.***
c) ***That the meters are a potential fire hazard***
d) ***That over billing has been a consistent part of the legacy of smart meters***
e) ***That their information may be both hacked by intruders, given or sold to other industries and/or law enforcement to do with what they will.***

f) That they are not being justly compensated for use of their property as a relay station for utilities smart grid networks.

In fact, when customers inquire about the above issues with their utilities in most states throughout the country and with their federal agencies, they are being misled or lied to on a consistent basis.

38)**MISREPRESENTATION**

http://legal-dictionary.thefreedictionary.com/Misrepresentation

"An assertion or manifestation by words or conduct that is not in accord with the facts."

These meters were represented as SAFE to consumers before, during and after they were rolled out and even after the utilities received all of the health complaints.

Nearly 100% of these documented complaints to the California and Texas PUC were first made to the utilities themselves to no avail.

39)**NEGLIGENCE**

http://legal-dictionary.thefreedictionary.com/negligence

"Conduct that falls below the standards of behavior established by law for the protection of others against unreasonable risk of harm. A person has acted negligently if he or she has departed from the conduct expected of a reasonably prudent person acting under similar circumstances."

As per state law, the utilities are ***required*** *to deliver* ***SAFE*** *electricity, gas and water.* ***Smart meters and smart grid violate this requirement. Citizens are also protected by the US Constitution, which smart meters and smart grid inherently violate.***

Smart Meters and Smart Grid Violate:

SB 17: On October 11, 2009, SB 17 was signed into law by former California Governor Arnold Schwarzenegger. The bill states that it is the policy of California to "modernize the states electrical transmission and distribution system to maintain **safe,** reliable, efficient and **secure electrical service**".

California Public Utilities (PU) Code § 8360-69,

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=puc&group=08001-09000&file=8360-8369

"It is the policy of the state to modernize the state's electrical transmission and distribution system to maintain **safe**, reliable, efficient, and **secure** electrical service…"

40) GROSS NEGLIGENCE

http://legal-dictionary.thefreedictionary.com/Gross+negligence

"An indifference to, and a blatant violation of, a legal duty with respect to the rights of others."

California Civil Jury Instructions (CACI)

http://www.justia.com/trials-litigation/docs/caci/400/425.html

Gross negligence is the lack of any care or an extreme departure from what a reasonably careful person would do in the same situation to prevent harm to oneself or to others. A person can be grossly negligent by acting or by failing to act.

Customers and citizens have the right and expectation NOT to be harmed by their utility meters and/or utility's grid. This has not been the case with smart grid and smart meters. The utilities have failed to act in good faith regarding this matter and have acted with wanton disregard for all human health and life and multiple legal and other rights granted by the US Constitution as expressed throughout this entire document.

41) Malice and Aforethought

http://legal-dictionary.thefreedictionary.com/malice+aforethought

A predetermination to commit an act without legal justification or excuse. A malicious design to injure. An intent, at the time of a killing, willfully to take the life of a human being, or **an intent willfully to act in callous and wanton disregard of the consequences to human life**; but malice aforethought does not necessarily imply any ill will, spite or hatred towards the individual killed.

Residents Sue California Utilities, Edison and PG@E for Health Effects From Smart Meters/Smart Grid

http://citizensforaradiationfreecommunity.org/wp-content/uploads/2013/06/COMPLAINT..1st_amended..LASC_..Smartmeter_Complaint_SCEA-5a.doc

"Defendants, and each of them failed to disclose to the Plaintiffs that: (a) industry experts and scientific study results differ as to the risks and biological effects that (may) arise from smart meter use;"

(c) **that the SAR measurements is not the product of a rigid testing and review, but rather obtained through a self-certification process, and failed to inform its users of the uncertainties and controversies that have been raging in our court system and scientific community for decades relating to telecommunication systems standards as to cause and effect, inter alia, all of which has produced limited choices to its users, due to a failure to exercise due diligence."**

1. "…that the SAR measurements is not the product of a rigid testing and review, but rather obtained through a self-certification process, and measures only the potential aspects of harm from short term exposure as opposed to the potential non thermal aspects of harm from prolonged exposure; which is where the controversy lies.

2. California Civil Code section 1708 provides that all persons must abstain from injuring the person or property of another or infringing upon the rights of another.

3. California Civil Code section 1709 provides that one who willfully deceives another is liable for damages.
4. California Civil Code section 1710 defines deceit as an untrue assertion or suppression of a fact so as to mislead, or a false promise.
5. California Civil Code section 1714(a) provides that liability for injuries arises from want of ordinary care or skill.
6. California Public Utilities Code section 8360 requires the safe, reliable, efficient deployment of the modern Smart Grid, including (h) providing customers with timely information and control options.
7. California Public Utilities Code section 8363 requires implementations of the Smart Grid in a manner which does not compromise safety, integrity or reliability.
8. Defendants, and each of them, as industry members, were aware, or should have been aware of numerous studies and experiments that demonstrated the health risks, hazards and detrimental biological effects of RFR. Peer-review research indicated, among other things, adverse biological effects resulting from exposure to varying levels of RFR because RFR is absorbed into human tissue, which produces harmful biological effects.
9. Defendants, and each of them did not inform Plaintiffs that that they would be the subjects of a state-wide experiment on the health effects of smart meter radiation.
10. Defendants, and each of them did not obtain the Plaintiffs' consent to participate in the experiment.

1. Defendants' wrongful conduct as herein alleged was willful, wanton, intentional, malicious, oppressive, and fraudulent in nature and justify the awarding of exemplary and punitive damages in an amount to be determined at trial.
2. As a result of the above referenced acts, Defendants fraudulently induced the Plaintiffs to pay utility fees and rental costs for the smart meters. At no time were the Plaintiffs aware of the dangers posed or connected with the smart meters.
3. Defendants and each of them suppressed material facts, and made certain misrepresentations of fact for the sole purpose of inducing the Plaintiffs to pay utility costs and rental fees for the smart meters.

11. At the time the suppressions of material facts and misrepresentations of fact were made by Defendants, Defendants had full knowledge of their falsity, and had no reasonable grounds for believing these misrepresentations to be true.
12. The true facts were that the Defendants were aware of the health risks posed by the smart meters and failed to disclose them to the Plaintiffs and the general public. The Defendants, and each of them, failed to disclose to the Plaintiffs that the defendants installed smart meters on the Plaintiffs' residences in order to secure revenue for said smart meters.

109. Defendants and each of them concealed these material facts from the Plaintiffs.

110. In reliance on these suppressions of material facts and misrepresentations of facts, the Plaintiffs acted as alleged above without knowledge of the true facts.

111. The aforementioned conduct of Defendants was an intentional misrepresentation, deceit, or concealment of a material fact known to the Defendants with the

intention on the part of the Defendants of thereby depriving Plaintiffs of property, loss of habitat or legal rights or otherwise causing injury, and was despicable conduct that subjected Plaintiffs to a cruel and unjust hardship in conscious disregard of Plaintiffs' rights, so as to justify an award of exemplary and punitive damages.

42) PUBLIC ENDANGERMENT

http://en.wikipedia.org/wiki/Endangerment

Public endangerment is a criminal act that can be prosecuted in a court. It is usually applied to crimes which place the public in some form of danger, although that danger can be more or less severe according to the crime.

The public is being put in danger. Life threatening and permanent health effects from the pulsed microwave radiation, including death, have been reported all across the country upon installation of smart meters/smart grid, (not to mention the fire hazards they create and injury and death that have been caused by smart meter fires). There is absolutely no way that the US Federal government and the military industrial corporations in receipt of smart grid and smart meter funding had no knowledge of the health effects of pulsed microwave RF radiation as this is currently the US weapon of choice in both stealth and non-stealth operations on and off the battlefield.

43) Wanton And Reckless Disregard for Human Life and The Rights of Citizens Under the Constitution

http://legal-dictionary.thefreedictionary.com/wanton

Grossly careless or negligent; reckless; malicious.

The term *wanton* implies a reckless disregard for the consequences of one's behavior. A *wanton act* is one done in heedless disregard for the life, limbs, health, safety, reputation, or property rights of another individual. Such an act is more than Negligence or gross negligence; it is equivalent in its results to an act of willful misconduct. A *wanton*

injury is one precipitated by a conscious and intentional wrongful act or by an omission of a known obligation with reckless indifference to potential harmful consequences.

Utilities and PUCs were made aware of health problems when smart meters were being installed in peoples homes. Most chose to completely and totally disregard ALL COMPLAINTS in this area. THAT is WANTON and RECKLESS disregard for human health and life.

44) EXEMPLARY DAMAGES

http://legal-dictionary.thefreedictionary.com/exemplary+damages

"Exemplary damages n. often called punitive damages, these are damages requested and/or awarded in a lawsuit when the defendant's willful acts were malicious, violent, oppressive, fraudulent, wanton, or grossly reckless."

CAL. PUC. CODE § 2106 : California Code - Section 2106

http://codes.lp.findlaw.com/cacode/PUC/1/d1/1/11/s2106#sthash.z1nLcL5s.dpuf

"Any public utility which does, causes to be done, or permits any act, matter, or thing prohibited or declared unlawful, or which omits to do any act, matter, or thing required to be done, either by the Constitution, any law of this State, or any order or decision of the commission, shall be liable to the persons or corporations affected thereby for all loss, damages, or injury caused thereby or resulting there from. If the court finds that the act or omission was willful, it may, in addition to the actual damages, award exemplary damages. An action to recover for such loss, damage, or injury may be brought in any court of competent jurisdiction by any corporation or person."

45) **SMART GRID VIOLATES STATE LAW**

UTILITIES CODE OF TEXAS

http://codes.lp.findlaw.com/txstatutes/UT/2/A/17/A/17.004

TITLE 2. PUBLIC UTILITY REGULATORY ACT
SUBTITLE A. PROVISIONS APPLICABLE TO ALL UTILITIES
CHAPTER 17. CUSTOMER PROTECTION
SUBCHAPTER A. GENERAL PROVISIONS
Sec.17.004.CUSTOMER PROTECTION STANDARDS.

(a) All buyers of telecommunications and retail electric services are entitled to:

(1) **Protection from fraudulent, unfair, misleading, deceptive, or anticompetitive practices, including protection from being billed for services that were not authorized or provided;**

(2) Choice of a telecommunications service provider, a retail electric provider, or an electric utility, where that choice is permitted by law, and to have that choice honored;

(d) The commission shall coordinate its enforcement efforts regarding the prosecution of fraudulent, misleading, deceptive, and anticompetitive business practices with the office of the attorney general in order to ensure consistent treatment of specific alleged violations.

California Public Utilities (PU) Code § 8360-69

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=puc&group=08001-09000&file=8360-8369

"It is the policy of the state to modernize the state's electrical transmission and distribution system to maintain **safe**, reliable, efficient, and **secure** electrical service…"and the California and US constitutions[12]

Opt out fees are illegal:

California Public Utilities Code Section 453:

http://law.onecle.com/california/utilities/453.html

(a) **No public utility shall, as to rates, charges, service, facilities, or in any other respect, make or grant any preference or advantage to any corporation or person or subject any corporation or person to any prejudice or disadvantage**.

(b) **No public utility shall prejudice, disadvantage, or require different rates or deposit amounts from a person because** of ancestry, **medical condition**, marital status or change in marital status, occupation, or any characteristic listed or defined in Section 11135 of the Government Code...

(c) **No public utility shall establish or maintain any unreasonable difference as to rates, charges, service, facilities, or in any other respect, either as between localities or as between classes of service.**

By failing to accommodate citizens with disabilities, not allowing corporations to opt out at all, only allowing certain residential customers to truly opt out of all smart RF meters and forcing them to withstand RF meters even after they paid an illegal opt out fee, "The Projects", and each of them, have breached the condition of accepting federal "bail out" or "stimulus" funds which must honor the ADA.

PUBLIC UTILITIES CODE SECTION 328-328.2

http://www.leginfo.ca.gov/cgi-bin/displaycode?section=puc&group=00001-01000&file=328-328.2

328. The Legislature finds and declares both of the following:

(a) In order to ensure that all core customers of a gas corporation continue to receive safe basic gas service in a competitive market, each existing gas corporation should continue to provide this essential service.

(b) No customer should have to pay separate fees for utilizing services that protect public or customer safety.

CAL. PUC. CODE § 394.25 : California Code - Section 394.25

http://codes.lp.findlaw.com/cacode/PUC/1/d1/1/2.3/12/s394.25

(b) An electric service provider may have its registration suspended or revoked, immediately or prospectively, in whole or in part, for any of the following acts:

(1) Making material misrepresentations in the course of soliciting customers, entering into service agreements with those customers, or administering those service agreements.

(2) Dishonesty, fraud, or deceit with the intent to substantially benefit the electric service provider or its employees, agents, or representatives, or to disadvantage retail electricity customers.

(3) Where the commission finds that there is evidence that the electric service provider is not financially or operationally capable of providing the offered electric service.

(4) The misrepresentation of a material fact by an applicant in obtaining a registration pursuant to Section 394.

There are SO MANY EXAMPLES of misrepresentation, fraud and deceit with smart meters and smart grid it is hard to know where to start.

Michigan Penal Code, Act 328 of 1931

MCL 750.539a

http://www.legislature.mi.gov/%28S%28tak3tm554ezjag4531mc4tu1%29%29/mileg.aspx?page=getObject&objectName=mcl-750-539a

This law defines "Private Place", "Eavesdrop", Surveillance" and "Person"

(1) **"Private place" means a place where one may reasonably expect to be safe from casual or hostile intrusion or surveillance** but does not include a place to which the public or substantial group of the public has access.

(2) **"Eavesdrop" or "eavesdropping" means to overhear, record, amplify or transmit any part of the private discourse of others without the permission of all persons engaged in the discourse. Neither this definition or any other provision of this act shall modify or affect any law or regulation concerning interception, divulgence or recording of messages transmitted by communications common carriers.**

(3) **"Surveillance" means to secretly observe the activities of another person for the purpose of spying upon and invading the privacy of the person observed.**

(4) **"Person" means any individual, partnership, corporation or association.**

THE MICHIGAN PENAL CODE (EXCERPT)
Act 328 of 1931

MCL 750.539d

http://www.legislature.mi.gov/%28S%28tak3tm554ezjag4531mc4tu1%29%29/mileg.aspx?page=getObject&objectName=mcl-750-539d

750.539d Installation, placement, or use of device for observing, recording, transmitting, photographing or eavesdropping in private place.

(1) Except as otherwise provided in this section, a person shall not do either of the following:

(a) **Install, place, or use in any private place, without the consent of the person or persons entitled to privacy in that place, any device for observing, recording, transmitting, photographing, or eavesdropping upon the sounds or events in that place.**

(b) Distribute, disseminate, or transmit for access by any other person a recording, photograph, or visual image the person knows or has reason to know was obtained in violation of this section.

(3) A person who violates or attempts to violate this section is guilty of a crime as follows:

(a) For a violation or attempted violation of subsection (1)(a):

(i) Except as provided in subparagraph (ii), the person is guilty of a felony punishable by imprisonment for not more than 2 years or a fine of not more than $2,000.00, or both.

(ii) If the person was previously convicted of violating or attempting to violate this section, the person is guilty of a felony punishable by imprisonment for not more than 5 years or a fine of not more than $5,000.00, or both.

(b) For a violation or attempted violation of subsection (1)(b), the person is guilty of a felony punishable by imprisonment for not more than 5 years or a fine of not more than $5,000.00, or both.

(4) This section does not prohibit a person from being charged with, convicted of, or punished for any other violation of law committed by that person while violating or attempting to violate subsection (1)(a) or (b).

Civil Rights, An Overview

http://www.law.cornell.edu/wex/civil_rights

"A civil right is an enforceable right or privilege, which if interfered with by another gives rise to an action for injury. Examples of civil rights are freedom of speech, press, and assembly; the right to vote; **freedom from involuntary servitude**; and **the right to equality in public places**. **Discrimination occurs when the civil rights of an individual are denied or interfered with because of their membership in a particular group or class.** Various jurisdictions have enacted statutes to prevent discrimination based on a person's race, sex, religion, age, previous condition of servitude, **physical limitation,** national origin, and in some instances sexual orientation."

46) Energy Companies Using Smart Grid to For Financial Gain, To Try To Remain Relevant and Slow the Inevitable Death of Their Unsustainable Business Model, As Natural Resources Dry Up and Sustainable Resources Take Over, Potentially Enabling Citizens to LEAVE Their Energy Suppliers In the Dust

Electrical Companies Try and Quash Sustainable Energy Solutions Like Solar!

On Rooftops, A Rival For Utilities

http://www.nytimes.com/2013/07/27/business/energy-environment/utilities-confront-fresh-threat-do-it-yourself-power.html?ref=dianecardwell

"For years, power companies have watched warily as solar panels have sprouted across the nation's rooftops. **Now, in almost panicked tones, they are fighting hard to slow the spread."**

"Alarmed by what they say has become an existential threat to their business, utility companies are moving to roll back government incentives aimed at promoting solar energy and other renewable sources of power."

"In Arizona, for example, the country's second-largest solar market, **the state's largest utility is pressuring the Arizona Corporation Commission, which sets utility rates, to reconsider a generous residential credit and impose new fees on customers, months after the agency eliminated a commercial solar incentive**. In North Carolina, **Duke Energy is pushing to institute a new set of charges for solar customers** as well."

"Making more power closer to where it is used, advocates say, can reduce stress on the grid and make it more reliable, as well as save utilities from having to build and maintain more infrastructure and large, centralized generators."

"Utilities generally make their profits by making investments in infrastructure and designing customer rates to earn that money back with a guaranteed return, set on average at about 10 percent."

The following video shows how utility companies like Edison DO NOT WANT SOLAR ENERGY!...

Save Rooftop Solar

http://www.saverooftopsolar.com/

California's AB-327 Officially Signed Into Law

http://www.renewableenergyworld.com/rea/news/article/2013/10/californias-ab-327-officially-signed-into-law

"In its initial form, AB-327 was criticized for its language that would have empowered utilities to flatten their rate structures while also charging consumers flat monthly fees, seen as **squarely targeting rooftop solar growth in the state**."

Current smart meter and smart grid technology will most likely be obsolete in 5 years. This has sweeping ramifications to tax payers and utility customers not interested in wasting money.

The Smart Meter Cost

http://canadafreepress.com/index.php/article/55399

“The Smart Meter is a propaganda device to benefit utility companies, the electronic industry, and the global government”

“How expensive and accurate are the old meters? **The general manager for a rural electric co-op covering five counties explained to me that contract meter readers on foot get paid approximately 80 cents to read an old, traditional meter, for a total of $10 per year.** And they are using their own cars and gas. We can assume less cost in urban areas due to the proximity of meters. **“Electromechanical meters installed in the late 1940s are still functioning and are accurate. Most have zero maintenance.** Power companies are selling electromechanical meters for $2 each, which are nearly new, because they are surplus equipment to the power companies switching to smart meters.”

“On the other hand, the average life of a smart meter is about 10 years or less due to baking in the sun, exposure to the elements and to the overheating of the meter itself. The electronic displays are the most common part to fail. A laptop computer can read the count sometimes; otherwise the reading is estimated in order to preset it on the replaced meter. The cheapest smart meter cost $135 per unit, plus the installation cost of at least $30 per hour, a car, electrical training, equipment training and other materials, pension, and healthcare benefits.”

Getting Smarter About the Smart Grid

Full Report:
http://gettingsmarteraboutthesmartgrid.org/pdf/SmartGrid_Report_PDF-2012-11-26-Final.pdf

Short form
http://gettingsmarteraboutthesmartgrid.org/press_release_shortform.html

“WASHINGTON, D.C., Nov 26, 2012 (BUSINESS WIRE) -- A new policy report focused on the electric grid and economy of energy, "Getting Smarter About the Smart Grid", was published today by the National Institute for Science, Law & Public Policy (NISLAPP) in Washington, D.C. **The report states that billions of dollars in federal subsidies for "smart" utility meters have been misspent on meter technology that will not lead to energy sustainability or contribute to the possibility of a more efficient and responsive electricity grid.”**

Press Release:
http://www.gettingsmarteraboutthesmartgrid.org/press_release.html

Smart Grid Funding Misspent On Obsolete Technologies, Says New Report: Billions spent with taxpayer dollars on "smart meters" will not lead to U.S. sustainability; Place citizens and economy at risk

WASHINGTON, D.C. — November 26, 2012. A new policy report focused on the electric grid and economy of energy, *"Getting Smarter About the Smart Grid"*, was published today by the National Institute for Science, Law & Public Policy (NISLAPP) in Washington, D.C. The report states that **billions of dollars in federal subsidies for "smart" utility meters have been misspent on meter technology that will not lead to energy sustainability or contribute to the possibility of a more efficient and responsive electricity grid.**

"*Getting Smarter About the Smart Grid"* is authored by smart grid technology expert Timothy Schoechle, PhD, an international consultant in computer engineering and standardization, high-tech entrepreneur and former Faculty member of the University of Colorado, College of Engineering and Applied Science.

"***Getting Smarter About the Smart Grid"* states that Congress, state and local governments, as well as ratepayers, have been misled about the potential energy and cost saving benefits of the new "smart" meters, paid for in large part with taxpayer dollars, as well as ratepayer dollars.**

Dr. Schoechle, who has been engaged in development of electric utility meters, home automation systems, gateways, and energy management systems for over 25 years, and who sits on several international standards setting committees related to the smart grid, **calls the smart meter being rolled out across the U.S. "a canard—a story or hoax based on specious claims about energy benefits…"**

Schoechle says the present policy approach to electricity infrastructure in the U.S. evidences a "fundamental lack of understanding of the problems associated with the future of electricity and energy".

***"Getting Smarter About the Smart Grid"* recognizes the growing grass roots rebellion against smart meters now happening in 18 states, such as CA, VT, AZ, TX, FL, PA, ME, IL, OR and the District of Columbia, as only the "tip of the iceberg"—one that conceals a deeply dysfunctional energy economy needing urgent federal, state and local attention. Ratepayers' desire to "opt-out" of the new wireless meters on privacy, security, reliability, cost and potential public health grounds may herald, the report says, "an epochal transformation of the political economy of energy".**

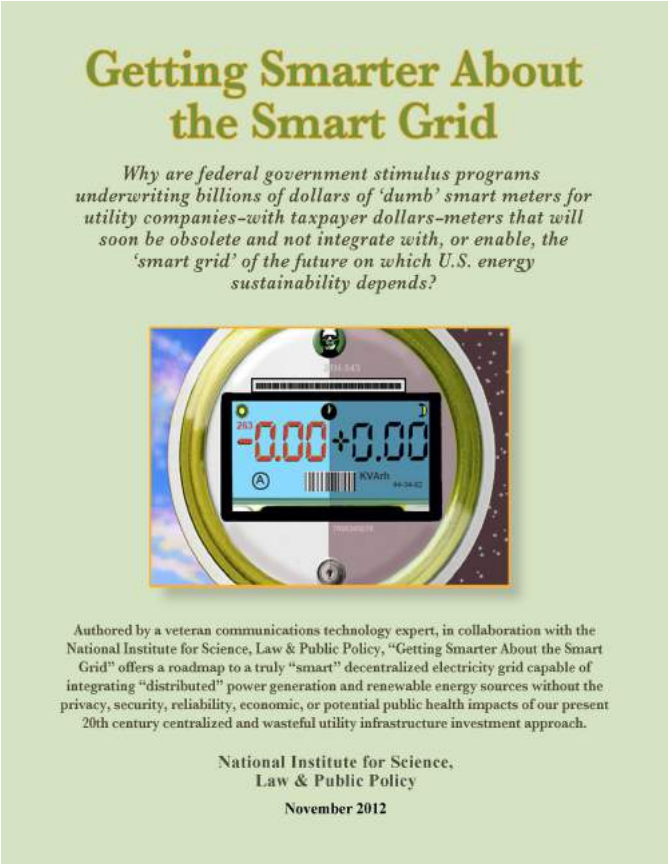
"***Getting Smarter About the Smart Grid"*** **exposes inherent conflicts in the monopoly utility business model preventing the nation from moving to a renewable energy economy.** It defines the technology investments, and standardization, as well as regulatory action, needed for an electricity grid that is wealth-creating, interconnected, secure, and empowering of people. **The report says the nation's energy and economic future can no longer be left in the hands of a monopoly power industry dis-incentivized to take the necessary steps toward renewable energy and sustainability.**

Jim Turner, Esq., Chairman of the National Institute for Science, Law and Public Policy and partner in the D.C. law firm Swankin-Turner, says **"A key element in a successful transition to a renewable energy economy will be establishing a clear 'demarcation' line between monopoly utility space and customer premises space, where the home gateway belongs to the consumer, not the utility."**

Such a demarcation (or 'demarc'), a concept already embodied in electricity policy in Germany and in the Netherlands, was a critical element in the breakup of the landline telephone monopoly in the U.S. and **lead to significant growth in the consumer electronics industry as market forces moved to better meet customer needs**. In Germany and the Netherlands, together with feed-in tariffs, where homeowners are compensated for energy produced, this demarcation has opened the way for home-based energy management technologies to flourish and facilitate the growth of renewable technologies, while eliminating the potential for significant privacy invasions, with the homeowner in control of their meter data.

Key Points in ***"Getting Smarter About the Smart Grid"***

9 Problems With the Present Electricity Approach:



1. **Data to be collected by the smart meters, including intimate personal details of citizens' lives, *is not necessary* to the basic purpose of the smart grid,** such as supply/demand balancing, demand response (DR), dynamic pricing, renewable integration, or local generation and storage, as promoters of the meters, and uninformed parties, routinely claim.
2. **Federal, state and local governments have mistakenly believed that the installation of smart meters will somehow lead to reduction in use of fossil fuels, greater electricity efficiency and long-term energy economy benefits for the U.S.** In fact, efforts to further develop and standardize those technologies that could achieve those goals have languished, **while investments with stimulus funding have instead been made in technologies that merely serve the short-term economic interests of the utility industry and its suppliers** instead of the interests of a true smart grid which could economically integrate renewable technologies and distributed, or decentralized, power generation.
3.

3. Much of the $ multi-billion dollar federal subsidy for smart meters does not benefit ratepayers, nor support economic growth, but primarily benefits meter and meter networking manufacturers, while financially propping up unsustainable Investor-Owned Utilities (IOUs). Regulated utilities can charge back their capital investments to ratepayers, with a guaranteed 10-13% rate of return (ROR) on assets, by law. Thus, investors in utilities gain from the smart meter deployment, as they would from any other capital expenditure, while there is no clear gain and significant new risks (privacy, security, health & safety, costs) for the ratepayer. The allocation of stimulus dollars to subsidize smart meters has also been a net job destroyer, eliminating meter readers and creating manufacturing jobs overseas, while being an egregious waste of federal resources that only supports corporate interests and delays the needed transformation of the electricity grid.

4. **Because Investor-Owned Utilities (IOUs) are paid on a per-kilowatt-of-energy-sold basis, and also receive a guaranteed ROR on assets, they do not have a financial incentive to encourage less energy usage, or to invest in technologies that would help citizens reduce energy consumption.**
5. **Because coal plants must run at near capacity to achieve necessary economies of scale, adding renewable energy to the power mix may be in fact cost-additive for utilities, not cost-reducing, and ultimately cost-additive for ratepayers. Thus, there is an inherent conflict between coal-based power generation, the dominant means of electricity generation in the U.S., and a transition to renewable energy technologies that could lead to sustainability.** The report recommends the U.S. "move away from dependency on baseload generation, particularly coal, as quickly as possible" to facilitate renewable integration and reach our potential for energy independence.
6. **Despite paying lip service to the public's interest in incorporating renewable energy, as evidence in their marketing materials, utilities actually 'curtail', or waste, much of the renewable energy now generated in order to protect the economics of investor-owned coal plants.** *"Getting Smarter About the Smart Grid"* explains why state initiatives wanting to fulfill the promise of a 30% or higher renewable portfolio standard (RPS) is practically impossible in a coal baseload system.
7. **U.S. policy statements "reflect the mistaken belief that the basic solutions involve fixing or modernizing the existing electricity grid, rather than complete structural transformation of electrical service, which goes beyond particular 'smart' technologies."** In reality, shaving peak energy usage by shifting loads may actually increase energy bills as well as CO2 emissions by increasing dependency on coal baseload generation—the most expensive generation there is when considering the totality of subsidies and externalized costs. Increasing baseload dependency will not lower energy costs, as it appears our Administration believes, and it will further obstruct integration of renewable sources.
8. **Expected growth in electric vehicles within a coal-based system will only worsen the nation's baseload dependency, thus making the needed shift away from coal to a renewable energy future that much more pressing.**
9. **Leadership in the energy sector is unlikely to come from the top, due to 'regulatory capture', unless caused by a catastrophic event or consequence.** At present, there appears to be little evidence utilities and their regulators want to or know how to make the needed changes to the utility business model, leaving it to the American public, through community-based initiatives and municipalization efforts, to drive the needed change toward renewable technologies and distributed, non-centralized power generation—as is now happening in such places as Boulder, Colorado.

7 Opportunities to Intelligently Move Forward:

1. **The U.S. must move away from dependency on coal baseload power generation and toward renewable sources.**
2. **Free, renewable energy resources must be prioritized and local opportunities for power generation and storage pursued.** We must stop subsidizing a

centralized, wasteful infrastructure approach that will not lead to sustainability or empower citizens to contribute to the grid.

3. **A clear legal and policy demarcation between customer premises space and utility space must be established**. Utilities should not be the sole "gatekeeper" for access to energy applications controlling consumer use, storage, and generation of electricity. As occurred in the telecommunications industry, establishing a clear market demarcation could unleash the creativity and competitive market strength of consumer electronics, appliance manufacturers, homebuilders, solar installers, apps developers, etc.
5. **Localize electric power, using distributed renewable sources, instead of large solar and wind farms where the economies of scale are not significantly greater than at small scale.** Localization of power generation avoids the energy loss and environmental and capital costs that come with long-distance energy transmission, keeps money in the community, with a 3.5x multiplier effect, and enhances reliability, responsiveness and grid security.
6. **State legislatures should enable PUCs to fundamentally change the utility business model so it can be sustainable.** Utilities must move to a service model that is not based on the present economics of commodity sale of electricity and rate of return regulation (ROR) that encourages unwise capital investments. Generation must be deregulated and separated from distribution, and the customer premises opened up to market competition in products and services for the premises-based generation, storage, management, and use of electricity. For example, some states are already moving to deregulate renewable generation for the charging of electric vehicles.

7. Local communities must take it upon themselves to understand and obtain the safest and most secure technological options available for utility meters…"

In the Foreword to *"Getting Smarter About the Smart Grid",* journalist and political analyst Duncan Campbell summarizes, ***"Dr. Schoechle examines and explains the prevailing confusion about the "smart grid" and offers a clear path forward, lucidly showing an alternative to patching up our overly-complex, vulnerable, and increasingly expensive energy system—thus creating a truly smart and genuinely sustainable electricity system."***

Download "Getting Smarter About the Smart Grid"
Educational Audio and Video Quadrilogues with Tim Schoechle, PhD and others involved with the production of *"Getting Smarter About the Smart Grid"* can be found at www.GettingSmarterAbouttheSmartGrid.org/audio.html

Smart Grid Speakers Bureau – Tim Schoechle, PhD, Duncan Campbell, Esq. and others involved in electricity municipalisation efforts in CO, are available to address communities on this topic.

www.GettingSmarterAbouttheSmartGrid.org

47) DOE Violates Record Keeping Laws and Stonewalls Investigations Into "Smart" Money Give Away and Other Record Keeping

Watchdog group: DOE violates records laws

http://dailycaller.com/2013/09/17/watchdog-group-doe-violates-records-laws/#ixzz2jyY1ZSaW

"Cause of Action asked the Energy Department for records regarding the identity and creditworthiness of the 460 applicants who had applied to the agency's loan program, which guaranteed loans to green energy companies such as Solyndra, Abound Solar and Fisker."

"However, CoA received a response that caused them to question the Energy Department's record-keeping practices. **The agency failed to produce letters they are required to send to the Internal Revenue Service when assessing the creditworthiness of a loan applicant."**

"This could be in violation of the Federal Records Act, according to CoA."
"The Federal Records Act requires each agency head to make and preserve records," said Dan Epstein, CoA's executive director. "By failing to preserve these records, the DOE may have violated the Federal Records Act and its own regulations implementing the Act."

"Cause of Action was given 131 letters that the IRS submitted in response to the DOE's tax delinquency requests for loan applicants. This means there should have been 131 corresponding letters from the DOE to match the IRS records. However, the DOE only has corresponding letters for eleven of the 131 letters — **meaning it was missing 120 corresponding letters to the IRS."**

"The DOE told CoA that it does not actually maintain letters it sends to the IRS."

48) GOVERNMENT OFFICIALS MAY BE HELD PERSONALLY LIABLE FOR CIVIL RIGHTS VIOLATIONS AND OTHER LEGAL AND CONSTITUTIONAL VIOLATIONS

Although these citations are in no way meant to be taken as threats, they should be taken seriously and at face value. It is important for government officials and agency personnel to know that lawsuits are being filed around the country on the issue of smart meters and smart grid and that as people are becoming aware of what is going on in terms of violations to the US Constitution and human rights, so are any and all legal options for remedy and justice at this time are being explored.

18 USC § 241 Conspiracy Against Rights

http://www.law.cornell.edu/uscode/text/18/241

This statute makes it unlawful for two or more persons **to conspire to injure, oppress, threaten, or intimidate any person** of any state, territory or district **in the free exercise or enjoyment of any right or privilege secured to him/her by the Constitution or the laws of the United States, (or because of his/her having exercised the same).**

42 U.S.C. 1986 - Action for Neglect to Prevent with Civil Rights:

http://www.law.cornell.edu/uscode/text/42/1986

"Every person who, having knowledge that any of the wrongs conspired to be done, and mentioned in section 1985 of this title, are about to be committed, and having power to prevent or aid in preventing the commission of the same, neglects or refuses so to do, if such wrongful act be committed, shall be liable to the party injured, or his legal representatives, for all damages caused by such wrongful act, which such person by reasonable diligence could have prevented; and such damages may be recovered in an action on the case; and any number of persons guilty of such wrongful neglect or refusal may be joined as defendants in the action; and if the death of any party be caused by any such wrongful act and neglect, the legal representatives of the deceased shall have such action therefore…"

18 USC 242 - Deprivation of Rights Under Color of Law

http://www.law.cornell.edu/uscode/text/18/242

Whoever, under color of any law, statute, ordinance, **regulation**, or custom, **willfully subjects any person** in any State, Territory, Commonwealth, Possession, or District to the **deprivation of any rights, privileges, or immunities secured or protected by the Constitution or laws of the United States**, or to different punishments, pains, or penalties, on account of such person being an **alien**, or by reason of his color, or race, than are prescribed for the punishment of citizens, **shall be fined under this title or imprisoned not more than one year, or both; and if bodily injury results from the acts committed in violation of this section or if such acts include the use, attempted use, or threatened use of a dangerous weapon**, explosives, or fire, **shall be fined under this title or imprisoned not more than ten years, or both; and if death results from the acts committed in violation of this section** or if such acts include kidnapping or an attempt to kidnap, aggravated sexual abuse, or an attempt to commit aggravated sexual abuse, or an **attempt to kill, shall be fined under this title, or imprisoned for any term of years or for life, or both, or may be sentenced to death.**

http://www.thefreedictionary.com/alien

Alien:

1. Belonging to, characteristic of, or constituting another and very different place, society, **or person**; strange. *(electrosensitives – people who experience physical pain from microwave emissions, qualify for this category)*

2. "Dissimilar, inconsistent…" *(electrosensitives – people who experience physical pain from microwave emissions, qualify for this category)*

3. A person who is not included in a group; an outsider. (electrosensitives – people who experience physical pain from microwave emissions, qualify for this category)

Emmy Award Winning Producer, Jerry Day on this subject…

To Utility Companies

http://www.youtube.com/watch?NR=1&feature=endscreen&v=UPLSwAm9DkQ

The Civil Rights Act, 1866

http://memory.loc.gov/ammem/amlaw/lwsllink.html

(from *U.S. Statutes at Large*, Vol. 14:27)

An Act to protect all Persons in the United States **in their Civil Rights, and furnish the Means of their Vindication.**

Sec. 3 *And be it further enacted,* That the district courts of the United States, … shall have, exclusively of the courts of the several States, **cognizance of all crimes and offenses committed against the provisions of this act,** and also, concurrently with the circuit courts of the United States**, of all causes, civil and criminal, affecting persons who are denied or cannot enforce in the courts or judicial tribunals of the State or locality where they may be any of the rights secured to them by the first section of this act….**
Sec. 4 *And be it further enacted,* **That the district attorneys, marshals, and deputy marshals of the United States, the commissioners appointed by the circuit and territorial courts of the United States, with power of arresting, imprisoning, or bailing offenders against the laws of the United States,** the officers and agents of the Freedmen's Bureau, and every other officer who may be specially empowered by the President of the United States, shall be, and they are hereby specially authorized and **required, at the expense of the United States, to institute proceedings against all and every person who shall violate the provisions of this act, and cause him or them to be arrested and imprisoned, or bailed, as the case may be**, for trial before such court of the United States or territorial court as by this act has cognizance of the offense…"

There are MANY violations of human rights happening right now regarding the roll out of smart meters and smart grid in addition to other involuntary radiation exposure to this kind of radiation throughout the world. If the issue of health effects from exposure to non ionizing radiation (such as from cell phones and cell towers) has been covered up, the roll out of smart meters has BLOWN THE LID off this issue by delivering this radiation in a very personal way, *right to each and everyone's doorstep. Anger is mounting about this ubiquitous, mandatory exposure to this carcinogenic, privacy invading device and infrastructure and people are beginning to wake up and do something about it!*
We beseech Congress, the federal regulatory agencies charged with over site on this issue and the White House to stop the collusion in these crimes and begin cleaning up the enormous mess that was made by funding this punishing program.

Implementation of the 7 items offered in the beginning of this document would be a giant first step towards this end.