Compilation of below article and additional resources as add-ons, put together specifically for Michael Vialpando of LPC by Doe Kelly and other "Team Smart Meter" volunteers, presented to Michael via email attachment in April 2022. Thank you, Michael, for being interested, and for your willingness to learn more on this subject.

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Dirty Electricity and its Effects

"Dirty electricity, also called electrical pollution, is *high-frequency voltage transients riding along the 50 or 60 Hz electricity provided by the electric utilities*. It is generated by arcing, by sparking and by any device that interrupts current flow, especially switching power supplies."

Above excerpt from an abstract in Pub Med: "Dirty electricity, chronic stress, neurotransmitters and disease" by Samuel Milham and David Stetzer.

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The sheer volume of modern electronics and appliances in homes and other settings has increased at an astounding rate over recent years. This proliferation of electrical devices has made our lives more efficient and convenient but also has contributed to a harmful form of electro-pollution known as dirty electricity (DE).

DE is also known as dirty power, electrical noise, line noise, power line electromagnetic interference (EMI), electromagnetic conducted emissions (EMC), and micro-surge electrical pollution. It is unusable electromagnetic energy in the form of spikes, surges, and interruptions in the flow of 60 Hertz AC electricity traveling through wires and electrical systems where only standard 60 Hertz AC electricity should be. The name for this unusable energy is "high voltage frequency transients," or just transients, for short.

DE is created by electrical devices that no longer use standard AC electricity "as is," but must change or manipulate standard electrical current into other forms of electricity to operate, such as low voltage DC or higher frequency AC. Many devices draw power from wiring in short, intermittent

bursts (rather than a continuous flow of energy) by turning the flow of power to a device “on” and “off” repeatedly, often thousands of times per second. This type of process interrupts the smooth flow of standard 60 Hertz AC, creating harmonics and frequency variations, or erratic surges and spikes of electrical energy.

This transient and excess electrical “noise” spreads through existing wiring, generating a surrounding electromagnetic field (EMF) of radiation that extends outward all around the wires, at right angles to the direction of current flow, and radiates out into the room. Standard appliances and electronics end up receiving not only the normal electricity they need, but also dirty electricity on the wiring. This can be a problem for electrical devices that are not equipped to deal with all that electrical pollution.

DE also disrupts vital electrical processes within our bodies. According to Dr. Samuel Milham, in his book, *Dirty Electricity: Electrification and the Disease of Civilization,* "Ambient dirty electricity couples capacitively to the human body and induces electrical currents in the body." Exposure to this type of EMF radiation has been associated with a wide variety of health problems, such as: asthma, sleep disturbances, allergies, memory loss, ADD/ADHD, heart arrhythmia, diabetes, cancer, and many more. Some researchers estimate that 3-6% of the general population may have **severe** symptoms from exposure to EMFs, with an additional 35% having more mild symptoms, but all biological life is affected by it.

DE and “Smart Meters:”

Switching-mode power supply devices (SMPS) are especially powerful sources of DE and are in common usage to step down 110 or 220-volt AC to 2-10 volts DC. They are in operation in battery chargers, light dimmer switches, fluorescent lights, cordless telephones, computers, WiFi routers, home entertainment systems, etc. *Digital, and two-way wireless communication electrical rate meters, known as “smart meters*,” use SMPS mechanics to step down 240 volts AC, coming directly from utility power lines, to roughly 3.3 volts DC required to run the meter’s digital electronics that records electricity usage data.

One issue with SMPS is ripple voltage, which is the residual periodic variation of the DC voltage in a power supply, caused by incomplete suppressions of the alternating waveform after rectification. It is understood

to be a source of wasted power, and of undesirable effects in a DC circuit, which includes the heating of components, noise and distortion, and may cause digital circuits to operate improperly.

The SMPS function in a smart meter emits sharp spikes of millisecond bursts of up to 50,000 Hertz and higher. Pulsing of high frequencies not only causes interference with other electronic equipment, as previously stated, but also *negatively affects biological systems* within its field of exposure. Average radiation exposure over time is not as much of a risk to biological functioning as are these large bursts of radiation. According to Dr. Milham, "The 'smooth' 60-Hz sine wave EMFs seem to have few biological effects in animal exposure studies. If frequencies are pulsed or modulated, they seem to become more bioactive."

Ecological Options Network (EON), a California-based nonprofit organization, investigated in 2010 as to *why smart meters installed by PG&E in California were thought to be causing so much sickness, and so many problems with other electric and electronic equipment*, and they sought the advice of electrical engineers. They learned about the SMPS function in the meters. The following is from a blog article by EON (https://eon3emfblog.net/new-critical-problem-with-smart-meters-a-switching-mode-power-supply/):

One of the engineers explains it this way: *“Extensive measurements have demonstrated that all of the meters measured so far, including ABB, GE, and Landis Gyr, emit noise on the customer’s electric wiring in the form of high frequency voltage spikes, typically with an amplitude of 2 volts, but a frequency anywhere from 4,000 Hertz, up to 60,000 Hz. The actual frequency of the phenomena is influenced by the devices that are plugged into the customer’s power. Some houses are much worse than others, and this observation has been confirmed by PG&E installers that have talked to us.”*

Even if people eliminated sources of DE in their homes and businesses, they would still be affected by the DE from smart meters and other sources from the buildings around them. DE generated outside the building can enter a building on electrical wiring or through ground rods and conductive plumbing.

It is beyond the scope here to address added concerns about adverse biological effects of radio frequency (RF) radiation generated by the wireless operation of smart meters. Suffice to say, they exist and there is science to prove it. People who knew of these risks would be more likely than not to participate in an "opt-out" program.

DE and “Opt-Out” Digital Meters

It must be pointed out, however, there is an **incomplete understanding** regarding the effects of so-called “opt out meters” of serious concern: if an “opt-out” program is offered by a utility company, *it must be acknowledged that DE* (different from RF/microwaves) *is* NOT *eliminated by the addition of a digital “opt-out meter”* (that has the capacity of two way broadcasting, but whose broadcast capacity is switched off); ***nor*** is DE eliminated by a digital “opt-out meter” with ***no*** built-in broadcast function. In both types of "opt-out" meter, DE would continue to flow throughout the household circuitry. In **neither** case would a digital “opt-out” meter prevent any potential negative health effects arising from exposure to that type of EMF. And if one does **not** choose to opt out, a *double risk* from both DE, and microwave emissions exists.

The study of DE is a relatively recent discipline, and there are dimensions of its operation that are not fully understood. The foremost expert is commonly agreed to be Dr. Samuel Milham, MD, MPH. His book, *Dirty Electricity*, and his website, www.sammilham.com are good sources of further study.

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ADDITIONAL RESOURCES ON DIRTY ELECTRICITY AND ILL HEALTH:

- Electromagnetic hypersensitivity: biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis.

  Havas M.Electromagn Biol Med. 2006;25(4):259-68. doi: 10.1080/15368370601044192.PMID: 17178585 Review.

- Evidence that dirty electricity is causing the worldwide epidemics of obesity and diabetes.

  Milham S.Electromagn Biol Med. 2014 Jan;33(1):75-8. doi: 10.3109/15368378.2013.783853. Epub 2013 Jun 19.PMID: 23781992

- Power quality affects teacher wellbeing and student behavior in three Minnesota Schools.

  Havas M, Olstad A.Sci Total Environ. 2008 Sep 1;402(2-3):157-62. doi: 10.1016/j.scitotenv.2008.04.046. Epub 2008 Jun 16.PMID: 18556048

- Dirty electricity elevates blood sugar among electrically sensitive diabetics and may explain brittle diabetes.

  Havas M. Electromagn Biol Med. 2008;27(2):135-46. doi: 10.1080/15368370802072075.PMID: 18568931 **Free PMC article.**

- "Dirty electricity": what, where, and should we care?

  de Vocht F.J Expo Sci Environ Epidemiol. 2010 Jul;20(5):399-405. doi: 10.1038/jes.2010.8. Epub 2010 Mar 24.PMID: 20336048

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VERY RECENT ARTICLE ON THIS TOPIC:

https://www.activistpost.com/2022/04/report-electric-smart-meters-pollute-the-electricity-grid-in-the-buildings-with-more-dirty-electricity-than-do-old-meters.html

Taken from the above recent post:

A new technical test report shows that the new “smart” electricity meters that have been rolled out in Norway and in other countries, in homes and at workplaces, pollute the electricity grid in the buildings with more “dirty electricity” than do old meters. Thereby, the new meters have the potential to be a health problem – even when they are “un-smartened”, i.e., with the radio transmitters in the meters removed or silenced. “Dirty electricity” is an industry term for several types of electrical noise spreading through power lines and creating or impacting electromagnetic fields around them.

MORE ON THE PAID OPT OUT AND WHY IT IS AN INEFFECTIVE ALBEIT WELL INTENDED SOLUTION:

> **“Just when you thought it was safe to opt out!”**
> https://eon3emfblog.net/new-critical-problem-with-smart-meters-a-switching-mode-power-supply/

Taken from the above-linked article:

“The ‘opt-out-for-a-price’ arrangement put forward by PG&E, in which ***the wireless meters would***, at the ratepayer’s expense, ***have its RF transmitting function turned off***, would still **not eliminate** the ‘dirty electricity’ flowing into the buildings’ wiring, and so **would not prevent negative health effects** in the buildings’ occupants.

This is further reason for the CPUC to ***declare a moratorium*** on e-meter deployment, and ***schedule a fully transparent public hearing on all aspects of the meters’ operation.”***

Quotes from 2009 article found in Prevention Magazine:

What follows are a few quotes on this subject from a pair of 2009 Prevention Magazine articles (links to which were no longer active):

… a particular kind of EMF, a relatively new suspected carcinogen known as high-frequency voltage transients, or "dirty electricity." Transients are largely by-products of modern energy-efficient electronics and appliances–from computers, refrigerators, and plasma TVs to compact fluorescent lightbulbs and dimmer switches–which tamp down the electricity they use. This manipulation of current creates a wildly fluctuating and potentially dangerous electromagnetic field that not only radiates into the immediate environment but also can back up along home or office wiring all the way to the utility, infecting every energy customer in between…

… "Opposite charges attract, and like charges repel. When a transient is going positive, the negatively charged electrons in your body move toward that positive charge. When the transient flips to negative, the body's electrons are pushed back. Remember, these positive-negative shifts are occurring many thousands of times per second, so the electrons in your body are oscillating to that tune. Your body becomes charged up because you're basically coupled to the transient's electric field."

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… "A report that cited more than 2,000 studies found that chronic exposure to even low-level radiation (like that from cell phones) can cause a variety of cancers, impair immunity, and contribute to Alzheimer's disease and dementia, heart disease, and many other ailments.

One likely way: EMFs open the blood-brain barrier, causing blood vessels to leak fluid into the brain and damage neurons. What's more, a less–well known kind of EMF, known as "dirty" or transient electricity, may play an even more damaging role. Transients are largely by-products of modern energy-efficient electronics and appliances—from computers, refrigerators, and plasma TVs to compact fluorescent lightbulbs and dimmer switches—which tamp down the electricity they use.

This manipulation of current creates a wildly fluctuating and potentially dangerous electromagnetic field that essentially charges up the electrons in every cell of your body. Some research suggests that by overlapping the body's signaling mechanisms, transients may interfere with the secretion of insulin, drown out the call and response of the immune system, and cause other physical havoc."

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AN EXTREMELY CAUTIONARY TALE FOR LONGMONT, PLEASE TAKE THE TIME TO READ:

https://eon3emfblog.net/new-critical-problem-with-smart-meters-a-switching-mode-power-supply/

Below is a letter sent to the CPUC (CA Public Utilities Commission) by engineer Rob States:

Two engineers have been diligently working on Smart Meter dirty power and RF issues – the combined team possess two MS degrees from MIT, a California P.E. license (Professional Engineer's License), and a PhD from Stanford in Electrical Engineering, Magna Cum Laude. They have been working on this nearly continuously for the last four months.

The scientific data tells us that 5% of the population will get sick immediately from RF disease, and another 10% will develop the disease over time. This means about 4.5 million people in California are potential victims.

Since individuals with no history of RF disease are experiencing symptoms the first day the meter is installed, we can assume the meter's RF emissions are not the only problem. The RF network is activated months after initial meter installation.

Extensive measurements have demonstrated that all the meters measured so far, including ABB, GE, and Landis Gyr, emit noise on the customer's electric wiring in the form of high frequency voltage spikes, typically with an

amplitude of 2 volts, but a frequency any ware from 4,000 Hertz, up to 60,000 Hz. The actual frequency of the phenomena is influenced by the devices that are plugged into the customer's power. Some houses are much worse than others, and this observation has been confirmed by PG&E installers that have talked to us.

Since 85% of the population is not immediately affected by this phenomenon, the knowledge about what is causing symptoms in PG&E's customers will be slow to evolve. We expect word of mouth to be the primary information source since the media is so disconnected from this phenomenon.

The scientific literature has studied microwave illness since the 1930's when radar operators became ill. Radar equipment emits radiation that is intermittent, and recent scientific papers have increasingly reported that pulsed radiation is significantly worse than continuous radiation. Humans have been exposed to continuous microwave transmissions from radio for decades. Exposure that Smart Meters present to California citizens is new and unlike previous electromagnetic emissions.

PG&E has published none of the functional specifications of the meters now being installed, including their BLOCK DIAGRAMS, SCHEMATICS, or BILL OF MATERIALS. The scientific community has been prevented from identifying any of the design problems prior to their installations.

The decisions by PG&E and the CPUC to conduct NO SAFETY STUDIES has forced them to discover the current problem after the meters have been installed and after significant capital has been invested in this project. Even a rudimentary safety test with 100 randomly selected people would have probably uncovered this problem long before its appearance in PG&E's customer base.

The fix for preventing dirty power disease in PG&E customers is expensive. Because the dirty power must be stopped in the customer's LOW IMPEDANCE house wiring, all of the filter components must handle high power, and therefore are expensive. Current estimates put the end customer cost at $500, and that does not include fixing dirty power interactions that Smart Meter causes with devices already in the customer's home, such as computers, FAX machines, copiers, plasma TVs, and the like. Merely treating 15% of the California households puts the total liability

for after-market problems at $2B, approximately equal to the entire cost of the existing program's roll out.

Though 15% of the population has early and obvious symptoms, a large number of microwave disease related health problems will not surface for some time. As science advances, the links between microwave disease and its sources will only improve, causing ever increasing liability for societal institutions that are responsible for the offending emissions. Though the cell phone industry has purchased immunity from liability through their extensive lobbying efforts, the experience of the tobacco and chemical industries has shown that this immunity can fade as priorities of the general population affects the political process.

Though microwave disease is not directly observed in 85% of the population, the asymptomatic effects (meaning effects that have no apparent symptoms) are well published in the scientific literature and span a wide variety of lethal and debilitating diseases, including cancers, auto immune diseases, suicide risk, depression, tinnitus (ringing in the ears), and a host of others. Steve Job's pancreas and liver problems are particularly conspicuous when manifested in a lifelong vegetarian who was chronically exposed to pulsed microwave emissions from Wi-Fi, computer power supplies, and the like. Liability for microwave diseases could explode in the future, as data in the cell phone industry already suggests.

Among the population of affected individuals, there are sure to be attorneys who are experienced in class actions suits, and who clearly recognize a $2B avoidable cost has been imposed on an unwilling public. This type of lawsuit has been responsible for some of the largest corporate liabilities in our civilization's history and has already affected PG&E and the CPUC in the past (i.e., hexavalent chromium in Hinkley CA).

Once the California real estate community becomes aware that 15% of the general population will no longer be able to live, work, or shop in their properties, the potential liability will be in the trillions of dollars and will affect a population of wealthy individuals who have significant political influence in Sacramento. These entrepreneurs have been particularly skilled at legally punishing institutions that are responsible for declines in their asset values. In fact, the asset base of the retirement trust of California's state employees is significantly exposed to California's real estate market.

A reasonable person could conclude that the potential liability PG&E currently faces, both immediately and in the evolving future, could be significantly larger than their asset base. Their long-term survival as a corporation could be at risk, and a potential outcome could include the wholesale transfer of their asset base into receivership pending settlement of outstanding liabilities.

Legal liability could force PG&E to approach the CPUC for a doubling of the existing utility rate. This would be a politically untenable request and could result in the dissolution of the CPUC's existing regulator authority.

The future for both the CPUC and PG&E is uncertain, and potentially disastrous. A prudent course would be to treat the entire Smart Grid project in California as a major risk, and to aggressively engage in damage control. Since the technology that is actively being dismantled by the CPUC and PG&E has previously demonstrated none of the current risks, an aggressive plan to offer an analog meter opt out is a prudent option. Since so much damage has already been done, there are no guarantees that even this measure will prevail.

PG&E's current course of relying on PR spin has little chance of stemming the trends that have already been set in motion.

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To view a video presentation by Rob from 2011:
https://eon3emfblog.net/expert-debunks-corporate-smart-meter-craze/

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SHORT “EXTRA” ON SMART METER FIRES:

2.5 min. video of a PG&E whistleblower saying PG&E knows the smart meters can cause fires.

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

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