Esteemed Members of the RI Public Utilities Commission:

I am sending this testimony in DOCKET NO. 22-49-EL re: ADVANCED METERING FUNCTIONALITY BUSINESS CASE AND COST RECOVERY PROPOSAL, in advance of the April 4, 2023 Public Hearing at the RI PUC.

My name is Sheila Resseger, and I am a long-time resident of Cranston, RI. I am submitting this written testimony to provide fuller information, with citations, for the oral testimony I plan to give at the April 4, 2023 RI PUC Public Hearing IN RE: THE NARRAGANSETT ELECTRIC CO. d/b/a RHODE ISLAND ENERGY ADVANCED METERING FUNCTIONALITY BUSINESS CASE AND COST RECOVERY PROPOSAL, DOCKET NO. 22-49-EL.

I am writing to convey my objection to RI Energy's plan to blanket RI residences and businesses with Advanced Metering Functionality devices, which I will refer to as Smart Meters, although these meters are anything but "smart."

For anyone who delves beneath the surface of RI Energy's assurances of the safety and security of these meters, it should be clear that they are neither safe nor secure. The public needs to be made aware of the many and serious flaws of Smart Meters. Those who have researched this topic know that we do not need and do not want the imposition of a technology that imperils health, collects intimate data from every household and business, causes household appliances to malfunction, causes electrical fires, requires excess electrical energy to run, increases atmospheric $CO_2$, and controls and unfairly monetizes consumers' energy use. Now that the AMR meters are aging out, do not rush to implement a rollout of Smart Meters. The default setting for houses, apartment complexes, nursing homes, schools, hospitals, and businesses should be safe, accurate analog meters.

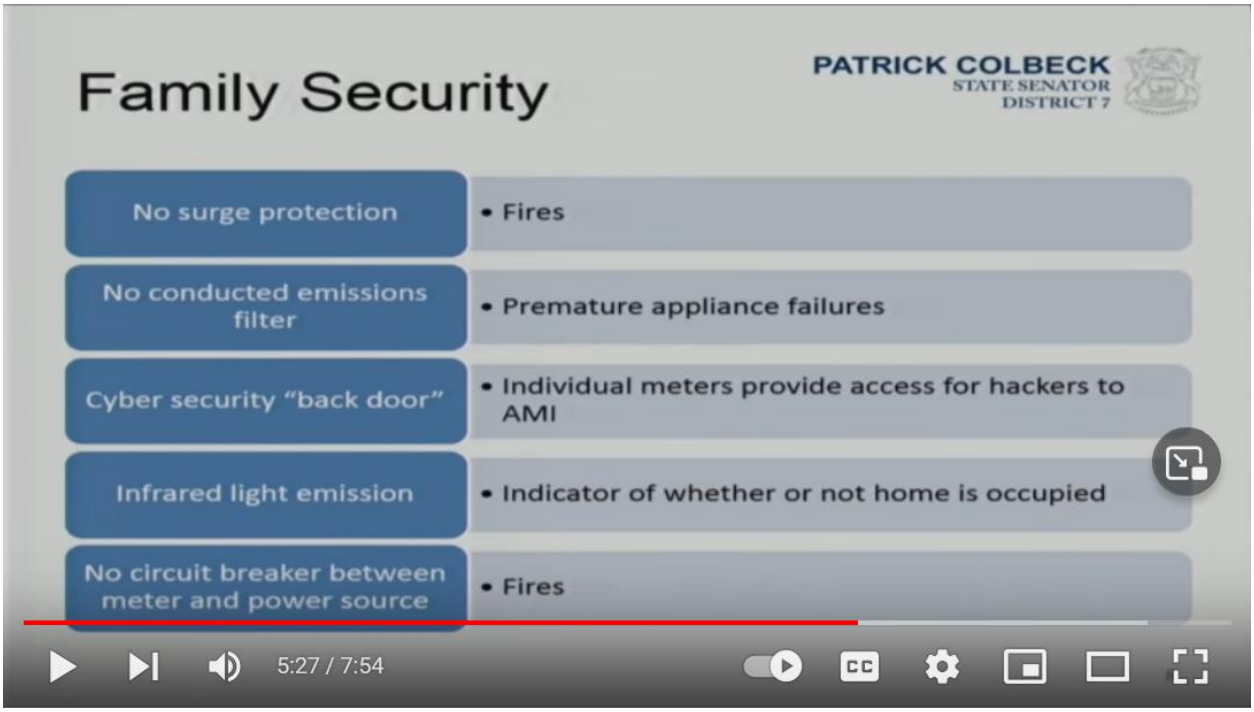
Analog meters cause none of the litany of negative effects that I just enumerated for Smart Meters. They are safe from toxic radiation, do not collect intimate data from every household and business, are accurate, do not require electrical energy to run, do not increase atmospheric $CO_2$, and do not cause household appliances to malfunction. Also, please keep in mind that analog meters have a lifespan of 30-50 years, while Smart Meters have to be serviced or replaced on a more frequent basis.

Negative health effects from Smart Meters include "insomnia, tinnitus, headaches, high blood sugar levels, and nervous disorders such as neuropathy and heart arrhythmia." (Bathgate, page 32) This quote regarding negative health effects is taken from the attached presentation by William Bathgate, Building Biologist. Please find more complete information in his full presentation. I have also attached key excerpts from his presentation for your convenience, which address not only negative health effects, but the plethora of reasons why Smart Meter technology is flawed, and analog meters are the tested and preferred way to measure utility use.

Please watch the description of the serious, debilitating health effects suffered by Dr. Alexia McKnight, DVM, DACVR, as explained during a Professional Development Day at her children's school this past fall. The effects were present when the Smart Meter was attached to her house and disappeared when it was removed, twice!
https://www.youtube.com/watch?v=1jlyuRcKI5w&list=PLMAz9ZRXjYmpnVJ1BLF3Yx_-jnO4nY9tK&index=25

I also urge you to watch a short presentation by Senator Patrick Colbeck, R-Canton, [Michigan]: "Colbeck testimony for true smart meter opt-out." "Senator Colbeck testified on March 7, 2017, before the House Energy and

Technology Committee in support of House Bill 4220, legislation that would restore consumer protections regarding the type of meters that are installed upon their personal property." Senator Colbeck is "an Aerospace Engineer with Bachelor's and Master's degrees in Aerospace Engineering; was responsible for the cabling design on the International Space Station for the Quest Airlock, and worked with the Department of Defense on training simulations designed to train the next generation of war fighters against different threats."




https://www.youtube.com/watch?v=xMnLZiMMfGI&t=2s

Smart Meters have been known to cause house fires. Here is a news report from Baltimore, MD this past December, 2022, one of many such examples.

https://www.wmar2news.com/matterformallory/smart-meter-catches-fire-utility-company-denies-homeowners-damage-claim

RI Energy tells the RI PUC and consumers in their document "Advanced Metering Functionality Business Case and Attachments" dated November 18, 2022 on page 125:

> There is no reliable scientific basis for a mechanism by which RF fields can cause effects in the human body other than through heating, i.e., a thermal effect. The RF fields from the AMF meter being used by Rhode Island Energy are far too low to cause a heating/thermal effect.
> The RF field levels from the AMF meters being used by Rhode Island Energy more than comply with the applicable FCC RF exposure limit for the radio in the AMF meters.

https://ripuc.ri.gov/sites/g/files/xkgbur841/files/2022-11/2249-RIE-AMFPlan-Book2%2011-18-22.pdf

However, these statements obviously ignore the findings of the U.S. Court of Appeals for the D.C. Circuit. In August, 2021 this court ruled in the historic case EHT et al. v. the FCC that the 2019 decision by the FCC to retain its **1996** safety limits for human exposure to wireless radiation was "arbitrary and capricious."

The court held that the FCC failed to respond to "record evidence [11,000 pages] that exposure to RF radiation at levels below the Commission's current [thermal] limits may cause negative health effects unrelated to cancer." Further, the court found the FCC failed to address these issues:

- impacts of long term wireless exposure,
- impacts to children,
- the testimony of people injured by wireless radiation,
- impacts to wildlife and the environment,
- impacts to the developing brain and reproduction.

https://ehtrust.org/in-historic-decision-federal-court-finds-fcc-failed-to-explain-why-it-ignored-scientific-evidence-showing-harm-from-wireless-radiation/

While RI Energy plans to provide an option to individual consumers of opting out of the Smart Meters, this is not sufficient to protect people who live in apartment buildings or need care in a hospital or experience radiation from their neighbor's Smart Meter. Therefore, I say NO to RI Energy's AMF plan. Thank you for consideration of my testimony.

Sincerely,

Sheila Resseger, M.A.

50 Malvern Avenue

Cranston, RI 02905

Retired teacher, RI School for the Deaf

Former sign language interpreter, Community College of RI

Co-founder, 5G Free RI

Board member, Toxics Information Project

Attachments:

Bathgate, William et al., "AMI Meters add to $CO_2$, Climate Change, and Higher Bills"

Excerpts from William Bathgate's Presentation on Smart Meters

Virginians for Safe Technology: Smart Meter—Truth vs. Myth

Excerpts from:

PowerPoint Presentation February 7, 2023

## In support of [New York State] S.8765 which seeks to establish consumer protection and utility meter choice

by
Les Jamieson, Member of New Yorkers 4 Wired Tech
William Bathgate, BBEC, EMRS, IEEE RFSO, Vice President of the Residential Consumer Group
Odette Wilkens, Attorney, founder of NY Wired Broadband (page 1)

"Note: The current electronic meters as deployed today [i.e. ALL electronic meters] are in violation of Equipment Authorization of the FCC, which requires a minimum physical separation of 20 cm (7.8 Inches) from the surface of the meter in all directions to prevent hazardous human exposure. (page 2) …

" … policy makers need to be aware that the utilities' claims of compliance with FCC guidelines refer [sic] to the Telecommunications Act of 1996 are unfounded due to the United States Court of Appeals for the District of Columbia Circuit decision … establishing that the FCC's refusal to update their [1996] guidelines was 'arbitrary and capricious'. This decision was upheld on Aug. 20th, 2021 [sic, August 13] when the court stated:
…the agency demonstrated 'a complete failure to respond to comments concerning environmental harm caused by RF radiation.' The court found the FCC ignored numerous organizations, scientists and medical doctors who called on them to update limits and the court found the FCC failed to address these issues:
impacts of long term wireless exposure

impacts to children,

the testimony of people injured by wireless radiation,

impacts to wildlife and the environment

impacts to the developing brain and reproduction.'

See https://ehtrust.org/in-historic-decision-federal-court-finds-fcc-failed-to-explain-why-it-ignored-scientific-evidence-showing-harm-from-wireless-radiation/ (page 3)

**AMI Meters add to $CO^2$/Climate Change and [to] Higher Bills**
By William Bathgate, BBEC, EMRS, IEEE RFSO
Vice President of the Residential Consumer Group
January 25, 2023
*Note: This report has been written in terms that a common person with limited knowledge of electricity and engineering can understand.* (page 4)

"He holds a DOD Top Secret Clearance, serving in Cyber Security with the US Missile Defense Agency, NASA and Homeland Security. He is a Certified Building Biologist and a Certified Electro Magnetic Radiation Specialist by the Building Biology Institute https://buildingbiologyinstitute.org/. He is an IEEE Certified Radio Frequency Safety Officer and conducts radio antenna surveys for assurance to the FCC specifications.

"He is Vice President of the Residential Consumer Group https://residentialcustomergroup.org/. This organization has legal representation in all Public Utility Rate Cases submitted in Michigan. To date the group has caused the cancellation of numerous rate increases in excess of over 1 Billion in increased utility costs to Michigan Residents. (page 5) …

**Agenda –What you need to know**
**The assertion that the RF [radiofrequency radiation] from an AMI meter is less than a cellphone is simply proven as untrue.**

**The AMI meters are increasing $CO^2$ causing climate change, not preventing it.**

**Billing and KWh/Carbon Footprint calculation issues you were not told of.**

**The infrastructure of AMI networks are not 100% secure and private. Analog meters are.**

**The suggestion that consumers can use AMI meter information to reduce their energy use is a fabrication because the consumer data is not real time. The one Day old data is useless.**

**The suggestion that AMI meters are more accurate is false. AMI and analog meters both have to meet the ANSI C12 specifications on accuracy.**

**The Meter RF signal can travel 1,400 –1,500 feet, right through a brick wall, making an opt out program useless in an apartment complex scenario. This is from the one of the meter manufacturers itself.** (page 6)

**"How far can the AMI meter transmit?**
**Between 1,400 ft and 2,300 ft. An AMI can also transmit thru a brick wall, wood, drywall etc.** (page 11)

"At 1,400 ft and 2,300 ft. RF would impact a consumer especially in an apartment or condo complex. If just one consumer requests an opt out meter, that consumer would be impacted by anyone within 1,400 feet that has an AMI meter. The same is true in single family home residences or neighborhood.

"The utility consistently states the RF emissions of the meters meet FCC requirements; this is a misleading statement. FCC requirements are for the effects of enough non-ionizing power to cause the brain to heat up 1°C. This is a deception because there are effects of non-ionizing radiation. There have been over 800 peer reviewed independent studies not funded by the industry that have linked this type of low level non-ionizing RF

radiation to a group of diseases including brain cancer, Parkinson's, Alzheimer's, high blood pressure, tinnitus, skin rashes and open sores as an example. Industry funded studies always fail to point out that 32% of their funded studies show an effect on health from non-ionizing radiation. The industry NEVER mentions these studies. This adds to confusion on the health effects attributed to the meters. I have personally met many of the affected consumers and this is no joke or set of psychological conditions. https://magdahavas.com/wp-content/uploads/2020/04/Havas-5G-health-humans-and-biota-April-15-2020.pdf (page 12)

**"AMI –"AMI -Smart Meters" use power from the Grid to operate –This adds to Climate Change**

**"Consider that the AMI meter is actually a powerful computer, not just a meter. In fact, the federal government classifies the AMI as a computer, not a meter.**

**The AMI meters require power from the grid to run the computer inside the meter. There is a Two Way radio in each AMI meter**

**There are special circuits that convert the AC power to DC to power the electronics of the circuit boards, CPU's, memory switching power supplies, LCD's, a solenoid and many other functions, etc. Those all consume power.**

**The analog meter consumes no power to operate. It has no electronics inside.** (page 13) …

"Conclusion: There is absolutely NO evidence the AMI Meter program saves $CO^2$, energy in kWh or money, in fact it only drains the bank accounts of the impoverished consumer, pads utility revenue and adds to Global Climate Change.

"The only way the AMI program will save kWh's is to use it to ration power to consumers via Demand Response/Time of Use rate structures at 5-10 X normal rates where the elderly, disabled and young families with a

parent and small children at home can least afford it or do without power during the Demand Response/Time of Use period. Under this scenario the AMI program is the largest fleecing of the consumer to ever exist and a deception to our citizens regarding saving power, reducing costs, reducing $CO^2$ and protecting our environment. We would be better off taking the money to be invested in AMI meters and plant trees. (page 16)

"**AMI is not Secure –It has a Physical Back Door**
"There is a special tool that is used to program the meter. A malicious actor can easily obtain one of these tools. A physical connection to the meter directly by-passes encryption, allowing privacy to be violated and hacking risk; insertion of code, altering the network traffic and injecting malicious code. They can even shut down the power. The default passwords are published in the meter documentation. (page 17) …

"Once access via the gateway is enabled there is no firewall to block data access, so personal email, video downloads data, etc. can be accessed by utilities and hostile actors. If you can get on the ZIGBEE network you can observe all this type of data. I can easily hack my neighbors ZIGBEE 2.45 GHz network and see all his information Realtime. (page 19) …

"*Analog Meter*

"The Analog meter has a direct one-for-one relationship between the current consumed in kWh's and the wheels turning the dials. There is no influencing factor or software that can alter this relationship. Also, since this is a current measuring device with no electronics, it is not readily affected by extremes in temperatures and humidity or short circuits.

"The analog meter has a means to direct excessive power surges to the house ground rod per UL 1449 specs. The life span of the analog meter is typically 30-50 years and is UL Listed (which means it is stamped with the UL logo). It has the same ANSI C12 specs for accuracy as the AMI meter. **Categorizations that the AMI meter is more accurate is not true, since**

**they both must meet the same ANSI C12 specs.** (emphasis added) (page 21) …

*AMI Meter*

"The AMI measured current does not have a one-for-one relationship between current consumed and indicated reading. This must be measured via an electronic sensor, converted to a digital signal and then a computer calculation averages all of the sensor input and posts the data in computer memory and the reading on the LCD display. There is a manipulation of the indicated reading that can be affected by many factors.

" … So claims by utilities that the AMI is more accurate is highly suspect. This is only true in a very tightly controlled setting such as ten 100 watt incandescent bulbs, not with electronic appliances, motors, CFL's, LED's etc. (page 22) …

With an AMI meter:

> **"Whatever your peak use is in a 15 minute window is what you get charged for the full 15 minute window**. (page 26) …
>
> "Conducted Emissions 'on the wire' …
>
> **"Customer appliances are breaking down, especially any appliance with an electric motor or critical electronics including pace makers, CPAP machines and other life sustaining medical equipment.** (page 28) …

" … both AMI meters (with the radios on or off) and the various forms of Electronic Meters. They are not compliant to FCC rules for 'conducted' Emissions Class A or Class B. Shown here are the limits for CONDUCTED emissions not Radio Emissions, which is a different specification, which are

being fed back into the home wiring at the load panel. This is placing stress on all electronics and electric motors in the home, causing early appliance motor failures, appliance electronic control failures and radio interference, in addition to health effects such as insomnia, tinnitus, headaches, high blood sugar levels and nervous disorders such as neuropathy and heart arrhythmia. (page 32)”

# BASIC INFO AND SOLUTIONS

**All underlined text are hyperlinked resources*

**WHAT ARE SMART METERS?**

The Environmental Health Trust states, "Smart meters are the new utility consumption measurement devices for electricity, water, and gas that are being installed across the nation, at residences and other buildings. There would be a separate meter for each type of utility and they are installed by the companies and governments that provide the utilities."

**WHY ARE CUSTOMERS CONCERNED ABOUT SMART METERS?**

Power companies are misrepresenting the reality of smart meters and forcing customers to get them regardless of their negative health impacts they are having. Virginia customers are led to believe that their only options are a smart meter or a opt-out smart meter, and now being threatened to have their power cut off when they express they'd like to keep their electromechanical analog meter or the ability to have one as an opt-out choice.

Smart meters violate residents/consumers on many levels - below are just a few:

- There is no informed consent prior to receiving a smart meter
- There is no disclosure of the smart meter risks involved in their installation and operation
- Smart meters are fire hazards (not UL certified)
- Smart meters have the ability to track specific energy usage within our homes (when we turn off the lights, when we flush the toilet, when we use the fan, etc.)
- Our data garnered by these smart meters can be used/sold without our consent
- Smart meters are part of the IoT mesh network created by all of the wireless "smart" devices and cell phone towers
- Smart meters are easily hacked
- Smart meters allow our electricity to be controlled by a push of a remote disconnect button, which means customer power is completely at the mercy of the powerful public utilities
- Smart meters are installed hot and many times without informing the homeowner first
- Subcontractors hired to install most of the smart meters are not licensed electricians

**SOLUTIONS**

- Take immediate legislative action to offer a state wide opt-out that includes electromechanical analog meters and non-wireless ethernet connection meters.

- Waive all fees for any opt-out selected for the meter itself, its installation, and continued operations.

- Mandate Dominion and other power companies to revise their RFR and Smart Meter Fact Sheets to be factual without industry bias and misrepresentations. (See Dominion Smart Meter FAQ's here: https://www.dominionenergy.com/projects-and-facilities/electric-projects/smart-meter-upgrades-va/smart-meter-faqs)

- Acknowledge that adverse harm can happen from low level radio frequency radiation (RFR) that is well below the FCC RF Safety Guidelines for thermal heating of tissue and that the effects are cumulative.

- Require all Virginia state procurement contracts for AMI smart meters to include a dirty electricity filter in the low kHz range for the switch mode power supply (SMPS).

- Require disclosures for conflict of interest in any health data that is used to make a claim that smart meters are safe.

- Create smart meter free safe zones (radiation-free areas) to protect those that are most vulnerable: school children, pregnant women, elderly, disabled, and those who are EMS, etc.

- Plan for installing Ethernet wired utility meters in the next 2-5 years as the smart meters fail or expire. These Ethernet meters have the capability for distributed energy resources, without the wireless connectivity, and are called Intelligent Energy Meters.

| WHAT ENERGY COMPANIES ARE CLAIMING* | THE TRUTH |
| --- | --- |
| Smart Meters are better for the environment. | • Dominion and others claims "smart" meters have less impact on the environment because they use less fossil fuel energy by not driving around and checking the analog meters. This statement is telling people to focus on one thing in order to completely ignore the fact that these meters emit radio frequency radiation (RFR) which is a Group 2B possible carcinogen and air pollutant as recognized by the telecom insurance industry (such as Swiss Re and Lloyds of London)<br>• Radiofrequency Radiation (RFR) is not good for the environment. The Communications Technology industry is slated to be using 51% of global electricity by 2030 and "smart" meters communicate up to 190,000 times a day, which is creating an RF mesh bubble all around our homes 24/7.<br>• Per the FCC, smart meters can consume up to 1W per household to complete their RF mesh operations. Using Dominion as an example, the corporation now has 2,589,754 million customers in the state of Virginia. This means Dominion is environmentally responsible for consuming more than 2.5 million more watts due to smart meters - and the greenhouse gasses that result from producing that additional power - so even if there is less fossil fuel being used for Dominion's trucks, it hardly offsets the toxic dumping of RF radiation pollution. The same goes for all power companies within the state and all other utility meters such as water and gas, which are operating at a much lower power level to support the IoT mesh network.<br>• RFR is not monitored by the EPA like other air pollutants. As the quality of our air continues to become more saturated with this wireless radiation, there is no one monitoring this air pollution and the the adverse health effects that result in each household by being exposed to unnecessary low levels of RFR in close proximity to the meter 24/7.<br>• There will never be "energy efficiency" as long as there is dirty electricity being generated by these smart meters in violation of FCC Part 15 interference rules.<br>• Smart meters have a life span of 5 to 7 years versus electromechanical analog meters, which last at least four decades if not more. These devices are now computers and they have to be maintained. Where will all of this unusable equipment go if not back into the environment? |
| Smart meters are designed to bring customers new levels of convenience and control. | • The opposite is true. Smart meters allow companies to turn off customer's power with a push of a button (unlike electromechanical analog meters) for reasons other than non-payment of bill and to know everything that goes on in the home. The Green Button Technology Alliance claims that Connect My Data (CMD) technology is the only way to get real-time data through software applications on wireless user devices such as cell phones. The security of our data is questionable, and third parties are given unfettered access to "unlock" utility data supposedly conditional upon the unknowing customer's electronic authorization. |
| Your data is secure [with a smart meter]. | • See this January 7, 2022 State Corporation Commission order (page 11) where the Walmart asks to bypass the customer in order to send the customer's interval data directly from Dominion to the third party vendor using "Connect My Data" green button functionality which purports to to deploy "privacy by design' software." However, any 3rd party vendor may be able to "unlock your utility data" for software application purposes. |

| WHAT ENERGY COMPANIES ARE CLAIMING* | THE TRUTH |
| --- | --- |
| Your data is secure [with a smart meter] (continued) | • See summary provided on hacking a smart meter by 'Hash", the Texas hacker. This hacker demonstrates how easy it is for an individual with the right equipment to intercept the smart meter data transmissions and decode the usage and location data that are attached to it. Each smart meter creates a node that can be hacked and include multiple customers' data by relay. It is also unclear as to how customer data will be used, as third parties are already making requests for direct access. These third parties are using voluntary customer authorization to access customer data and can potentially transition to an involuntary forfeiture of customer authorization in order to control resource distribution remotely. |
| Smart meters can measure energy usage in small intervals throughout the day, enabling [energy companies] to offer voluntary pricing plans with rates based on time-of-day usage, giving you even more control over your energy costs. | • Customers will not save money by having a smart meter on their home. Smart meters increase electricity bills because the customer has to pay for the dirty electricity voltage transients on the line, which adds about 10% more electricity to the bill. (Bill Bathgate, Michigan House Energy Committee Testimony, 2018). The voltage spikes make it look like the customer is using more electricity when they're not because the meter itself is using this electricity. There are reports of bills arbitrarily increasing - even doubling in one instance - and the companies claim this is due to customer usage when it could be the smart meter.<br>• Smart meters allow companies to offer "time-of-day usage" suggestions because they will have 24/7 access to how much power we are using, when we are using it, and which devices are turned on within our homes. This is an invasion of privacy.<br>• The Federal Wiretap Act and Stored Electronic Communications Act legally requires consent for installation of any surveillance device and any device that will collect and transmit private and personal data to unauthorized parties for unauthorized purposes. Authorization for sharing of personal and private information may only be given by the originator and subject of that information. |
| Smart meters are safe. | • The smart meter has insufficient electrical protections to prevent overheating, has no ground or surge protection and becomes an incendiary device on your house - Remote disconnect switch has a material defect that has not been fully mitigated where it easily overheats due to poor switch contact or cannot handle power surges when power is restored after an outage. This can result in arcing, sparking, popping and fires. ( See Norman Lambe's Century National insurance risk management report for these details).<br>• Stockton, CA, 2015: A high voltage power surge from a damaged utility pole made smart meters explode turning the smart meters and plastic covers into projectiles. Residents reported it shaking their homes and sounding like a bomb went off. This explosion resulted in 5,800 homes (10%) losing power, about 60 which were significantly damaged. |

| WHAT ENERGY COMPANIES ARE CLAIMING* | THE TRUTH |
|---|---|
| Smart meters are not on all the time. | • This is a misrepresentation of how smart meters work because it's not one single period of time in which the transmissions take place, there are continuous pulses throughout the entire day/night.<br>• The power companies indicate that data usage transmission only takes place twice an hour, which means the majority of the [up to] 190,000 pulses per day by the smart meter is for RF mesh maintenance (not for electricity usage data transmissions).<br>• The biological effects of these "erratic bursts of modulated microwaves, typically produce relatively potent and very short pulsed RF transmissions which have never been fully tested." The millisecond-long daily transmissions and a peak level emission two and a half times higher than the stated safety signal.<br>• Power companies don't take into account the low levels of RFR radiating 24/7 coupled with dirty electricity and the cumulative exposure effects of these erratic pulses over time. |
| Smart meters won't affect your health. | • The FCC RF maximum permissible exposure (MPE) safety limits are some of the highest in the world and power companies are not acknowledging that these safety limits were found to be arbitrary and capricious by the DC Court of Appeals in August 2021. 11,000 pages of evidence were submitted into the FCC record during this court case showing significant injuries can happen well below the current FCC RF safety guidelines. This means power companies still are not acknowledging these legal findings and only address the MPE health damages that can result from thermal heating. Who is protecting us?<br>• Smart meters conduct voltage transients or dirty electricity in the 2-50 kHz range which is within the frequency range that ICNRP, the FCC, and IEEE officially recognize as neurologically stimulating in humans.<br>• ICNRP cites that established adverse effects in individuals "exposed to low frequency magnetic fields are the stimulation of central and peripheral nervous tissues and the induction in the retina of phosphenes, a perception of faint flickering light in the periphery of the visual field." (Guidelines for Limiting Exposure to Time Varying Electric and Magnetic Fields (1 Hz TO 100 kHz), PG. 819. 2010)<br>• "In addition to nerve stimulation, radio frequency EMFs can affect the body via two primary biological effects: changes in the permeability of membranes and temperature rise." (ICNRP Guidelines for Limiting Exposure to Electromagnetic Fields (100 KHZ TO 300 GHZ) PG. 486, 2020)<br>• Ringing in the ears, leg cramps, balance problems, heart and eye problems, fatigue, headaches, "...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." https://smartmeterharm.files.wordpress.com/2012/12/1-smart-meter-problems-dec-2012-final.pdf (page 100), http://emfsafetynetwork.org/smart-meters/smart-meter-health-complaints/<br>• Smart meters create dirty electricity through their switch mode power supply operation and this dirty electricity can create serious health problems.<br>• According to Doctor Samuel Milham, "Since dirty electricity is a potent carcinogen, and causes numerous health problems, the only way to avoid a public health catastrophe is to send the smart meter information over existing telephone land lines or go back to the analog 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. (page 54) |

| WHAT ENERGY COMPANIES ARE CLAIMING* | THE TRUTH |
|---|---|
| Smart meters are more than 30,000 times lower than “always on” technology like your smartphone. | • According to Daniel Hirsch, retired director of the Program on Environmental and Nuclear Policy at the University of California, Santa Cruz, comparing RF radiation (RFR) exposures from a smart meter to RFR exposures from a cell phone is like comparing apples and oranges. Unless the RFR body exposure areas are standardized and the health effects of cumulative radiation (dosing) are acknowledged, then comparing smart meters to other types of RFR emitting technology will lead to grossly inaccurate conclusions. (See his video HERE)<br>• The radiation from a smart meter is whole body exposure and involuntary, whereas RFR from a cell phone is voluntary and exposes the neck and ear (radiating a much smaller surface area of the body) when in use.<br>• Smart meters are pulsating with RFR from a 902 MHz and a 2.4 GHZ antenna, in addition to dirty electricity within the 2 to 50 kHz range 24/7. This means there is no reprieve from the RFR and dirty electricity generated and transmitted throughout the house. Customers do not have the option of turning a smart meter off, ever.<br>• The FCC admitted in 2019 that some RFs can cause non-thermal adverse effects with RF frequencies ranging between 3 KHz and 10 MHz and dirty electricity generated by smart meters falls within this range. (Page 18) |
| Customers have the ability to opt out to a non-communicating meter. | • Dominion (and other's) "opt-out" is essentially an "opt-in" to allowing them to change out the customer's meter whenever they feel necessary, and mentions being able to disconnect power if a resident doesn't allow them to do so.<br>• Dominion (and other's) "opt-out" also only allows customers to opt-out to a "non-communicating" meter, which prior to 2022 meant the antennas were disabled and could easily be reset with software without the customer knowing. Calling this option a "Non-communicating" meter is misleading because the meter does communicate when it is arbitrarily reset. See HERE for Dominion Energy's information page about the non-communicating meter option.<br>• Virginians for Safe Technology is contacted daily by residents across the state who want to keep their electromechanical analog meter, but are being threatened to have their power cut off or their current meter forcefully changed out against their will. Power companies are demonizing customers who are attempting to protect themselves, while at the same time refusing to address any of these very important issues.<br>• Currently Farm structures and Businesses DO NOT have the ability to opt-out in the state of Virginia.<br>• Those who do Opt-out are signing an open ended contract and it is only an Interim solution which can be cancelled at anytime without notice to the customer. Legislation is urgently needed to change this, require notice if this type of work is going to be scheduled, and offer electromechanical analog and Ethernet connection meters as additional options to customers. |

*Statements taken from Dominion Energy's smart meter information page (with PDF's at the bottom):
https://www.dominionenergy.com/projects-and-facilities/electric-projects/smart-meter-upgrades-va

All underlined text above denotes hyperlinked sources

# In support of S.8765 which seeks to establish consumer protection and utility meter choice

February 7, 2023

Presenters:

Les Jamieson
Member of New Yorkers 4 Wired Tech

William Bathgate
BBEC, EMRS, IEEE RFSO
Vice President of the Residential Consumer Group

Odette Wilkens
Attorney, founder of NY Wired Broadband

# Proposed additions to S.8765 or possibly a companion bill

As it is, S.8765 provides benefits to utility customers with residential accounts by offering them the ability to retain use of their analog meter without fees being imposed. The following provisions would provide additional consumer protections to a broader scope of state residents:

There are many thousands of NY residents who own multi-family homes. In the interest of their rights as property owners, it is important that they be able to have analog meter choice for their entire property, not just the unit they live in. They need to be able to opt out for their rental units, and for accounts covering common areas within the building, such as hallways. Currently, hallways are designated by the utilities as being commercial. There is no opt out choice for any accounts designated as commercial

Owners of small businesses with accounts designated as commercial need to have analog meter choice. These include restaurants, and all manner of neighborhood shops. Owners and their staff spend substantial time in close proximity to utility meters.

Residents and pedestrians near buildings with digital meters installed on their exterior need protection from exposure to their RF emissions which are pulsed frequencies. This can be done with meter covers made up of a protective shielding material. Ideally, there should also be shielding behind the meter panel as well.

Large residential buildings have large panels with utility meters. These panels with digital meters also need to have meter covers made of protective shielding material. If the location of the digital meters is adjacent to living space, there needs to be shielding behind the digital meters as well.

Note: The current electronic meters as deployed today are in violation of Equipment Authorization of the FCC, which requires a minimum physical separation of 20 cm (7.8 Inches) from the surface of the meter in all directions to prevent hazardous human exposure.

## The Effect of the Appeals Court Ruling on Digital Meters

Policy makers working to serve the interests of their communities and the general public would benefit from the information to follow.

But first, policy makers need to be aware that the utilities claims of compliance with FCC guidelines refer to the Telecommunications Act of 1996 are unfounded due to the United States Court of Appeals for the District of Columbia Circuit decision on Aug. 13, 2019 establishing that the FCC's refusal to update their guidelines was "arbitrary and capricious". This decision was upheld on Aug. 20th, 2021 when the court stated:

…the agency demonstrated "a complete failure to respond to comments concerning environmental harm caused by RF radiation." The court found the FCC ignored numerous organizations, scientists and medical doctors who called on them to update limits and the court found the FCC failed to address these issues:

- impacts of long term wireless exposure
- impacts to children,
- the testimony of people injured by wireless radiation,
- impacts to wildlife and the environment
- impacts to the developing brain and reproduction.

See https://ehtrust.org/in-historic-decision-federal-court-finds-fcc-failed-to-explain-why-it-ignored-scientific-evidence-showing-harm-from-wireless-radiation/

# AMI Meters add to $CO^2$/Climate Change and Higher Bills

By William Bathgate, BBEC, EMRS, IEEE RFSO
Vice President of the
Residential Consumer Group
January 25, 2023

*Note: This report has been written in terms that a common person with limited knowledge of electricity and engineering can understand.*

# BACKGROUND: William S. Bathgate

William practices as a professional in electrical engineering and mechanical engineering disciplines. He was recently employed at Fiat Chrysler Automotive on electronics systems for such things as radio communication for electric and autonomous vehicles etc. William was previously employed through late 2015 for 8 years at the Emerson Electric Company. While at Emerson Electric he was the Senior Program Manager for Power Distribution Systems and in charge of RF and IP based digitally controlled high power AC power switching system product lines in use in over 100 countries. He was also directly responsible for product certifications such as UL (USA), CE (EU), PSE (Japan) and many other countries electrical certification bodies. He is very familiar with the electrical and electronic design of the AMI meters in use because he was responsible for very similar products with over 1 Million units installed across the world. William also has over 20 years work experience with IBM and Hewlett Packard in computer systems design and manufacturing.

He holds a  DOD Top Secret Clearance, serving in Cyber Security with the US Missile Defense Agency, NASA and Homeland Security. He is a Certified Building Biologists and a Certified Electro Magnetic Radiation Specialist by the Building Biology Institute https://buildingbiologyinstitute.org/. He is an IEEE Certified Radio Frequency Safety Officer and conducts radio antenna surveys for assurance to the FCC specifications.

He is Vice President of the Residential Consumer Group https://residentialcustomergroup.org/. This organization has legal representation in all Public Utility Rate Cases submitted in Michigan. To date the group has caused the cancellation of numerous rate increases in excess of over 1 Billion in increased utility costs to Michigan Residents.

He has done this analysis due to his own curiosity without conflict of interest of this new technology. He has 40 Years work experience in design and deployment of:

High tech power management systems, UPS and power distribution
Switched Mode Power Supplies
Electrical and Electronic hardware engineering
Computer systems engineering
Radio Systems design and testing
High Current and High Voltage switches
Internet communications using both wired and wireless technologies
UL, CE (Europe), Africa, Japan, Australia and China product safety certifications
Cyber encryption (DOD Level) and protection of Radio Communications using digital signals
RFI/EMI mitigation

# Agenda – What you need to know

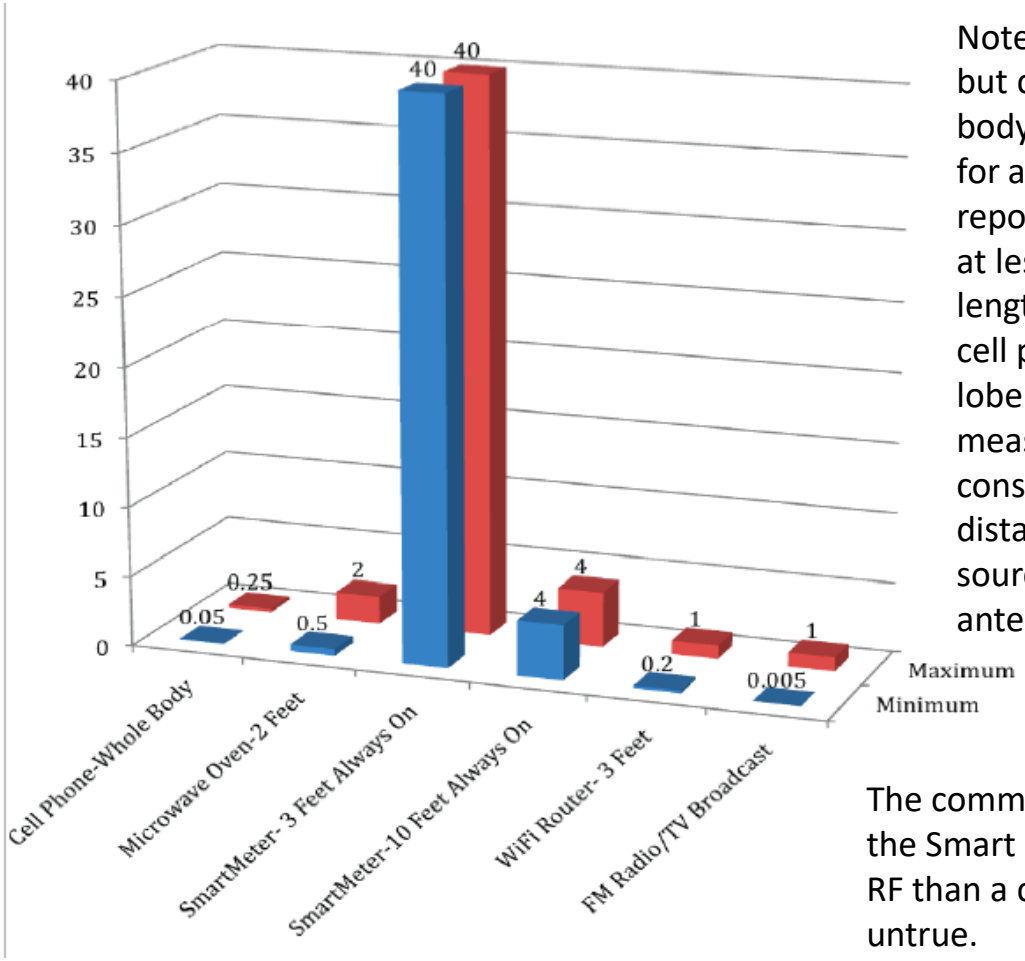
- **The assertion that the RF from an AMI meter is less than a cellphone is simply proven as untrue.**
- **The AMI meters are increasing $CO^2$ causing climate change, not preventing it.**
- **Billing and KWh/Carbon Footprint calculation issues you were not told of.**
- **The infrastructure of AMI networks are not 100% secure and private. Analog meters are.**
- **The suggestion that consumers can use AMI meter information to reduce their energy use is a fabrication because the consumer data is not real time. The one Day old data is useless.**
- **The suggestion that AMI meters are more accurate is false. AMI and analog meters both have to meet the ANSI C12 specifications on accuracy.**
- **The Meter RF signal can travel 1,400 – 1,500 feet, right through a brick wall, making an opt out program useless in an apartment complex scenario. This is from the one of the meter manufacturers itself.**

# It is not less than a cell phone call
# The Truth on RF Smart Meter Emissions

µW/CM²
Note: 1µW/CM²
= 10,000 µW/M²

The Smart meter is
400,000 µW/M² peak
@ 10 ft it is 100,000
µW/M² peak

Smart Phone is
0.25 µW/CM² = 2,500
µW/M² peak




Note – Initial ERPI report but corrected for whole body exposure vs at the ear for a cell phone. The original report from CCST measured at less than 3 RF wave lengths from the source i.e. cell phone right at the ear lobe. When conducting RF measurements you must consider the recommended distance between the RF source and the instrument antenna. Typical rule is 3.

The common assertion that the Smart Meter emits less RF than a cell phone is untrue.

Source – Dr. Daniel Hirsch on the CCST Report – is all in µW/CM²
CCST = California Council on Science and Technology

# Examples of Digital Meter Installations in Apartment Buildings


Note this is exceeding the FCC equipment Grant separation distance of 20 cm

Where:
S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

| MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure* | | | | | | | |
|---|---|---|---|---|---|---|---|
| Transmit Frequency (MHz) | Radio Power (dBm) | Power Density Limit (mW/Cm2) | Radio Power (mW) | Antenna Gain (dBi) | Antenna Gain (mW eq.) | Distance (cm) | Power Density (mW/cm^2) |
| 902.25 | 21.36 | 0.60 | 136.77 | 3.5 | 2.239 | 20 | 0.061 |
| 2405 | -3 | 1.00 | 0.50 | 4 | 2.512 | 20 | 0.000 |
| 824 | 32.4 | 0.55 | 1737.80 | 0 | 1.000 | 20 | 0.346 |
| 1850 | 30 | 1.00 | 1000.00 | 3 | 1.995 | 20 | 0.397 |

**Summation of Power Densities – Simultaneous Transmissions**
This device contains multiple transmitters which can operate simultaneously and therefore the maximum RF exposure is determined by the summation of power densities. The maximum power density as calculated by a summation of power densities for each transmitter is as follows

GPRS Modem Operating in the 800MHz Cellular Band:

| | |
|---|---|
| 900MHz LAN: | 0.061 (mW/cm^2) |
| 2.4GHz Zigbee: | 0.000 (mW/cm^2) |
| GSM 850 (GPRS): | 0.346 (mW/cm^2) |
| **TOTAL:** | **0.407 (mW/cm^2)** |

## Examples of Digital Meter Installations in Apartment Buildings

From the FCC Equipment Grant (ITRON Meter Example)

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| **TOTAL:** | **0.407 (mW/cm^2)** |

| µw/cm² | µw/m² | Plus gain of 3.5 |
|---|---|---|
| 0.407 | 4,070.00 | 14,245.00 |

## Examples of Digital Meter Installations on Exterior Walls

Albemarle St. and Nostrand Ave. in Brooklyn

51st Street between 4th and 5th Avenue in Brooklyn

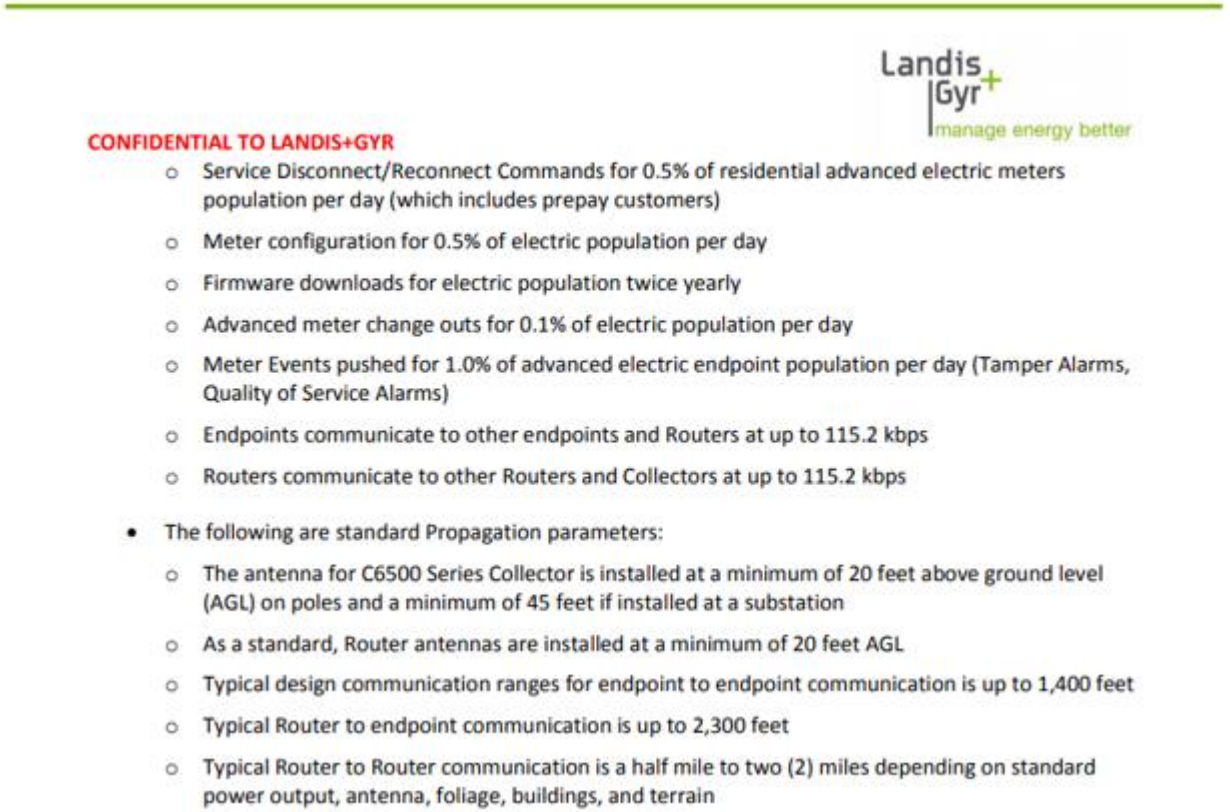
Building Biology International Safety Standards for RF for Human Exposure

| RF Radiofrequency Radiation | | No Concern | Slight Concern | Severe Concern | Extreme Concern |
|---|---|---|---|---|---|
| Power Density in microwatt per square meter | **µW/m²** | < 0.1 | 0.1 - 10 | 10-1000 | > 1000 |

As anyone who walks within 3 Meters of these meters their exposure is considered an Extreme Concern @ 14,245 µW/M²

# How far can the AMI meter transmit?

- Between 1,400 ft and 2,300 ft. An AMI can also transmit thru a brick wall, wood, drywall etc.



Landis+Gyr
manage energy better

**CONFIDENTIAL TO LANDIS+GYR**

- Service Disconnect/Reconnect Commands for 0.5% of residential advanced electric meters population per day (which includes prepay customers)
- Meter configuration for 0.5% of electric population per day
- Firmware downloads for electric population twice yearly
- Advanced meter change outs for 0.1% of electric population per day
- Meter Events pushed for 1.0% of advanced electric endpoint population per day (Tamper Alarms, Quality of Service Alarms)
- Endpoints communicate to other endpoints and Routers at up to 115.2 kbps
- Routers communicate to other Routers and Collectors at up to 115.2 kbps

- The following are standard Propagation parameters:
  - The antenna for C6500 Series Collector is installed at a minimum of 20 feet above ground level (AGL) on poles and a minimum of 45 feet if installed at a substation
  - As a standard, Router antennas are installed at a minimum of 20 feet AGL
  - Typical design communication ranges for endpoint to endpoint communication is up to 1,400 feet
  - Typical Router to endpoint communication is up to 2,300 feet
  - Typical Router to Router communication is a half mile to two (2) miles depending on standard power output, antenna, foliage, buildings, and terrain

# How far can the AMI meter transmit?

- At 1,400 ft and 2,300 ft. RF would impact a consumer especially in an apartment or condo complex. If just one consumer request an opt out meter, that consumer would be impacted by anyone within 1,400 feet that has an AMI meter. The same is true in single family home residences or neighborhood.

- The utility consistently states the RF emissions of the meters meet FCC requirements, this is a misleading statement. FCC requirements are for the effects of enough non-ionizing power to cause the brain to heat up 1° C. This is a deception because there are effects of non-ionizing radiation. There have been over 800 peer reviewed independent studies not funded by the industry that have linked this type of low level non-ionizing RF radiation to a group of diseases including brain cancer, Parkinson's, Alzheimer's, high blood pressure, tinnitus, skin rashes and open sores as an example. Industry funded studies always fail to point our that 32% of their funded studies show an effect on health from non-ionizing radiation. The industry NEVER mentions these studies. This adds to confusion on the health effects attributed to the meters. I have personally met many of the affected consumers and this is no joke or set of psychological conditions.
- https://magdahavas.com/wp-content/uploads/2020/04/Havas-5G-health-humans-and-biota-April-15-2020.pdf

# AMI – "AMI - Smart Meters" use power from the Grid to operate – This adds to Climate Change

- **Consider that the AMI meter is actually a powerful computer, not a just a meter. In fact, the federal government classifies the AMI as a computer, not a meter.**
- **The AMI meters require power from the grid to run the computer inside the meter.**
  - **There is a Two Way radio in each AMI meter**
  - **There are special circuits that convert the AC power to DC to power the electronics of the circuit boards, CPU's, memory switching power supplies, LCD's, a solenoid and many others functions, etc. Those all consume power.**
  - **<u>The analog meter consumes no power to operate</u>. It has no electronics inside.**

# How much power does the AMI meter consume?

- **I did a field test of the meter on my own home. I was in a unique position of not living in the home at the time and there were no lights or appliances operating.**
- **I turned all the breakers off in power panel, so there was nothing "On".**
- **The result was the AMI meter consumes ~2.7 KWh 's per day on average. Multiply that times the number of meters. It's a big number. It did not "Save" any power.**

- **Subsequently I built a special test set up so I can repeat the same test at any time. I can plug in any AMI meter in and see how much power the meter consumes all by itself. I get the same ~2.7 KWh 's/day regardless of meter brand. Analog meters consume no power.**

My Smart Meter Test Setup

# Proof - My Field Test - My Energy Insight Readings – Michigan example

**Average Daily AMI kWh Use 2.37 kWh @ 0.13 per kWh = $0.31/day (865 kWh/Yr.)**










This data was from Detroit Edison, as the reported power consumption on the home, with all the power off!

Note – No breakers were on and the time and reading of the meter is not a simple "Text" message these are clearly two way communication activity and the power to run the meter itself. It is not the same as a simple cell phone call.

# Impact to the Environment – Detroit Example

| Annual Cost per Customer | Rev $ per Detroit Edison | Rev $ per Consumer Energy | kWh per Detroit Edison | kWh per Consumer Energy | $CO^2$ Per Detroit Edison | $CO^2$ Per Consumer Energy |
|---|---|---|---|---|---|---|
| $113.15/Yr. | $235.35M | $203.67M | 1.816B | 1.521B | 3.924BT | 3.879BT |

| Total Consumer Costs Yr. | Total kWh Consumed Yr. | Total $CO^2$ Per Yr. (Coal @ 2.16lbs per kWh) |
|---|---|---|
| $439.02M | 3.337B | 7.803BT |

Note: Solar is 2.2 Lbs. total Embedded $CO^2$/kWh including Mining, transport, maintenance, etc.

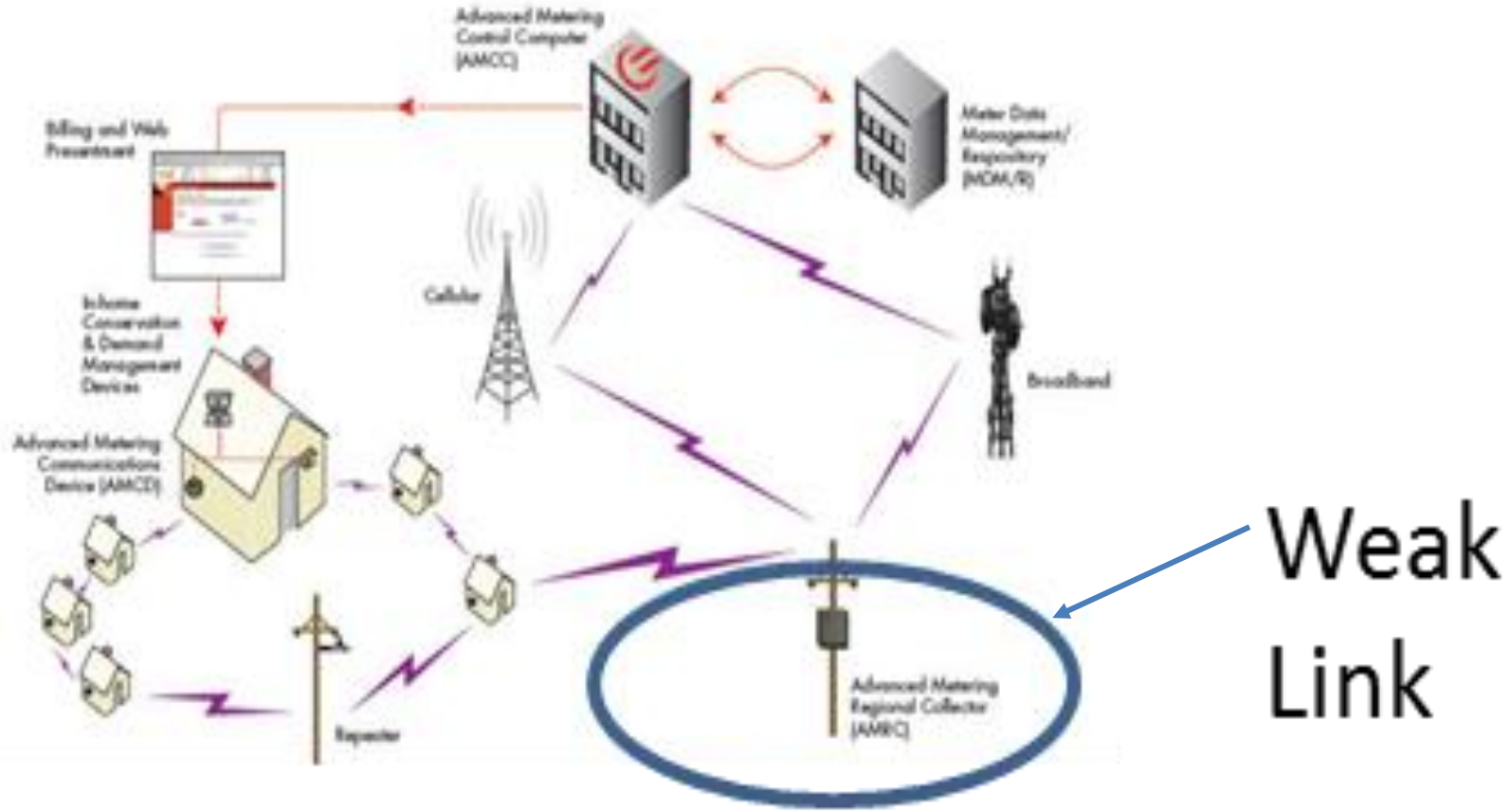
**Conclusion: There is absolutely NO evidence the AMI Meter program saves $CO^2$, energy in kWh or money, in fact it only drains the bank accounts of the impoverished consumer, pads utility revenue and adds to Global Climate Change.**

**The only way the AMI program will save kWh's is to use it to ration power to consumers via Demand Response/Time of Use rate structures at 5-10 X normal rates where the elderly, disabled and young families with a parent and small children at home can least afford it or do without power during the Demand Response/Time of Use period. Under this scenario the AMI program is the largest fleecing of the consumer to ever exist and a deception to our citizens regarding saving power, reducing costs, reducing $CO^2$ and protecting our environment. We would be better off taking the money to be invested in AMI meters and plant trees.**

# AMI is not Secure – It has a Physical Back Door

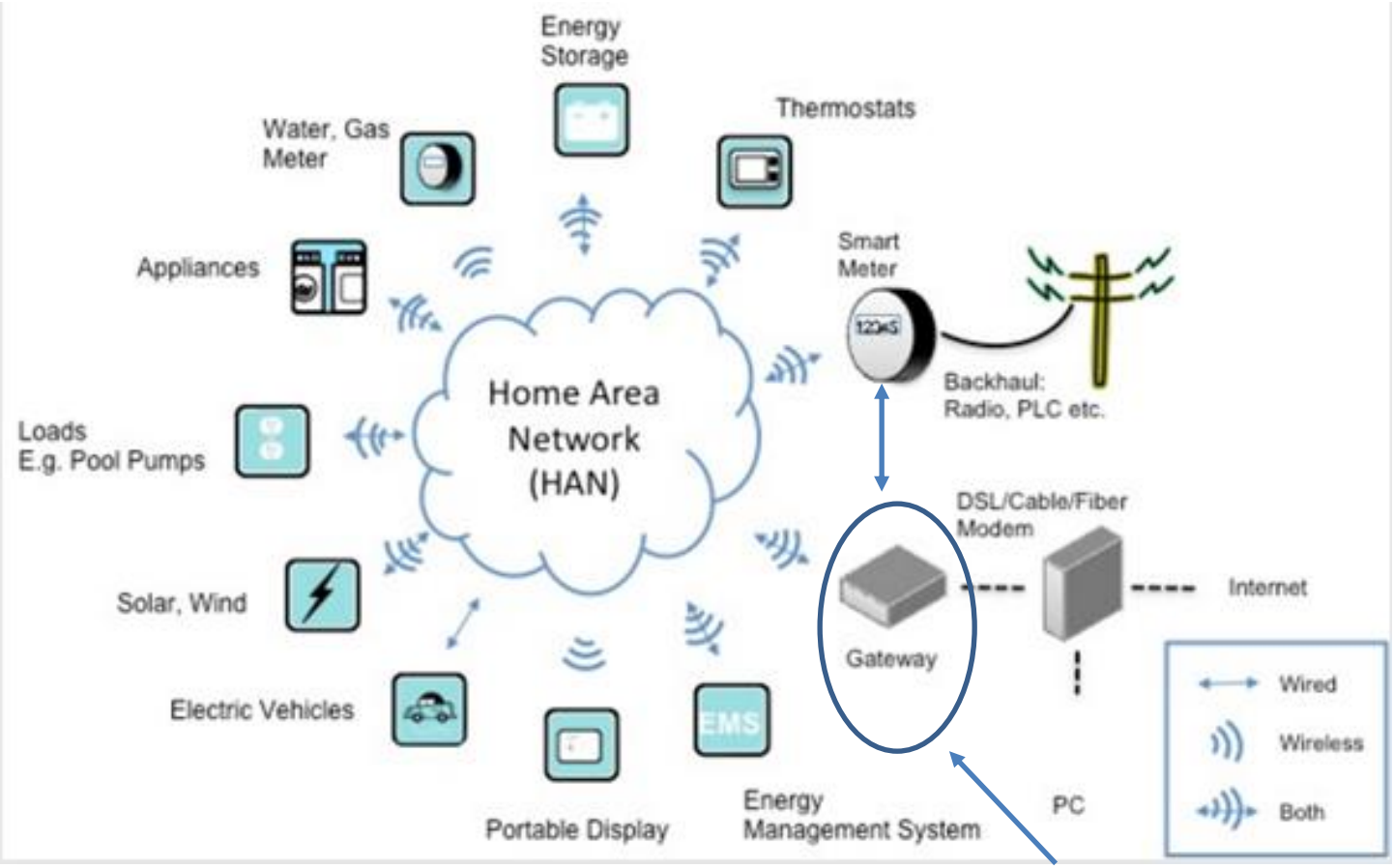
There is a special tool that is used to program the meter. A malicious actor can easily obtain one of these tools.
A physical connection to the meter directly by-passes encryption, allowing privacy to be violated and hacking risk; insertion of code, altering the network traffic and injecting malicious code. They can even shut down the power. The default passwords are published in the meter documentation.

# Network Weak Link



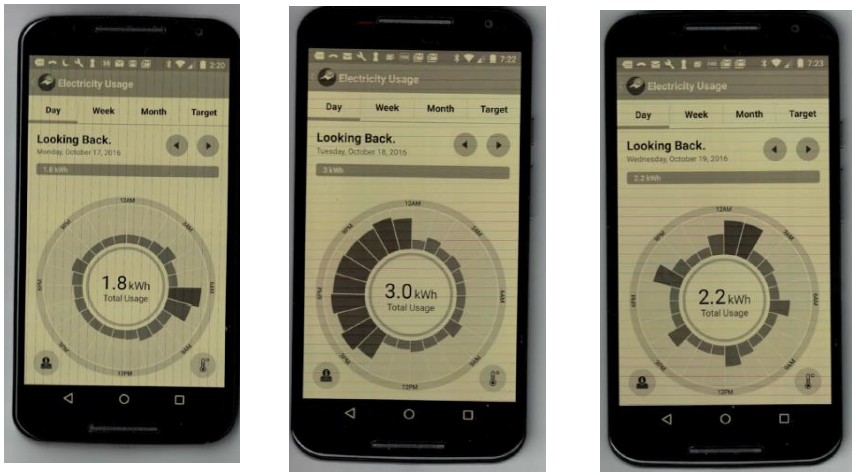

A malicious actor can send a strong RF broadband signal (multiple frequencies all at once) pointed at this network point, blocking transmission and no readings can be sent to the utility. The AMI meters have tamper protection in them and when they do not get an acknowledgment back from the utility over a certain period of time they begin to shut down. You do not need to know the encryption key, just block the transmission to the network access point with an overwhelming RF signal

# Back Door to the Data, Zigbee Net




Once access via the gateway is enabled there is no firewall to block data access, so personal email, video downloads data, etc. can be accessed by utilities and hostile actors. If you can get on the ZIGBEE network you can observe all this type of data. I can easily hack my neighbors ZIGBEE 2.45 GHz network and see all his information Realtime.

# Smart Meter - Day Old Data - will never let a consumer help prevent a “Brown Out”




Note – These are the readings of my electric use coming from DTE. This data is a day old. It is impossible to adjust my usage today based on usage from yesterday. Yesterday is gone and nothing can be done about it. Unless the meter information is “Continuously Real Time” there is no purpose in building out this capability. The utility costs to provide day old data is pointless. It is cute to see this information but the consumer cannot change behavior to effect a result to something that has already occurred.

# AMI versus Analog Meter Accuracy

## Key Differences

- *Analog Meter*
  - The Analog meter has a direct one-for-one relationship between the current consumed in kWh's and the wheels turning the dials. There is no influencing factor or software that can alter this relationship. Also, since this is a current measuring device with no electronics, it is not readily affected by extremes in temperatures and humidity or short circuits.

  - The analog meter has a means to direct excessive power surges to the house ground rod per UL 1449 specs. The life span of the analog meter is typically 30-50 years and is UL Listed (which means it is stamped with the UL logo). It has the same ANSI C12 specs for accuracy as the AMI meter. Categorizations that the AMI meter is more accurate is not true, since they both must meet the same ANSI C12 specs.

# AMI versus Analog Meter Accuracy

## Key Differences

- *AMI Meter*
  - The AMI measured current does not have a one-for-one relationship between current consumed and indicated reading. This must be measured via an electronic sensor, converted to a digital signal and then a computer calculation averages all of the sensor input and posts the data in computer memory and the reading on the LCD display. There is a manipulation of the indicated reading that can be affected by many factors.

  - All electronics components are rated between 1% to 20% accuracy. Most of the components on the AMI meters are 5% rated, with the current transformers rated at 1% accuracy within the permitted range of temperatures. I will point out that this 1% is only related to temperature, **not the measured load characteristic**. This is important because testing at the University of Twente in 2016 showed very high smart meter inaccuracies of 582% (https://www.utwente.nl/en/news/2017/3/313543/electronic-energy-meters-false-readings-almost-six-times-higher-than-actual-energy-consumption) with current transformers, such as in the all AMI meters, are generally accurate to within ±10%. That is a 20% range. So claims by utilities that the AMI is more accurate is highly suspect. This is only true in a very tightly controlled setting such as ten 100 watt incandescent bulbs, not with electronic appliances, motors, CFL's, LED's etc. (Note - a 100 watt light bulb can vary 5%)

# AMI versus Analog Meter Accuracy

## Key Differences

- *The ANSI C12 Standard – "Gold Standard" Missing*
  - The standard that all meters must meet is ANSI C12. It sounds impressive, however, there are two extremely important characteristics that this standard leaves out – a Gold Standard for reference and a real time clock to calculate kWh hrs.

  - I found it amazing to discover ANSI C12 does not present a "Gold Standard" reference for all meters to be compared to. For example your average meat market has a weight scale which is calibrated to a known standard such as weights in standard calibrated sizes for pounds and ounces. There is a seal affixed to that scale to assure the consumer they are not getting cheated. This characteristic does not exist in the ANSI C12 Standard.

# AMI versus Analog Meter Accuracy

## Key Differences

- *The ANSI C12 Standard - Real Time Clock*

  - There is no time standard reference in the ANSI C12 specification. In other words no “real time clock”. The analog meter did not need a clock; the gears in the meters did the calibrated settings to indicate kWh’s. This is extremely important because without a universal time standard, the AMI computer circuitry has no standard means to measure current consumption over a known reliable time period. So, how it calculates kWh measurements requires a very reliable and uniform time standard. In computer circuitry, a time synch process in the “stack” of processes is the least serviced characteristic leaving other more important computational process to have a higher priority. You may have had a home computer, which was not connected to the Internet where the indicated clock reading is off occasionally, with the time reading tending to drift a bit. The RF Emitting AMI meters have a means to keep the clock synced via the mesh network or cellular network. However, the Opt-Out AMI meter has no network connection so its clock will drift over time, which will affect the calculation of kWh’s. So, a consumer may not get the actual reading of the power they consumed. The Analog meter uses the gears to indicate the reading and does not drift, and therefore maintain accuracy.
  - If you have an AMI opt out program, you must use an analog meter to be accurate to the ANSI C12 standard.

# AMI versus Analog Meter

## Key Differences

- *The ANSI C12 Standard - Real Time Clock*

  - This is important to recognize because many utilities offer a Non – Communicating AMI meter. This has no real time clock reference. It will give erroneous readings as I have experienced.

  - Here is a photo of my meter installation. Note my calibrated analog meter is in series with my electronic AMI opt out meter. I read both meters every month at the same time and day of the month and compare them. I typically find the Electronic AMI is a higher reading than the Analog meter. I send these findings to the utility and they adjust my bill down to a matching reading. The utility now has given up any added charges of $10.00/month to my bill for manually reading my AMI meter.

# Meter accuracy and your bill

- As professed by Landis+Gyr, their AMI meter is “accurate” based on the Navigant Consulting Report in 2010 and referenced their web site. However, within this report the extremely high rate of billing complaints after the installation of the new meters is evident and explanations were difficult to verify as to their cause. The number of complaints was dramatic. This baseline of complaints was done in Texas with real temperature ranges from ~30 to ~88 degrees.

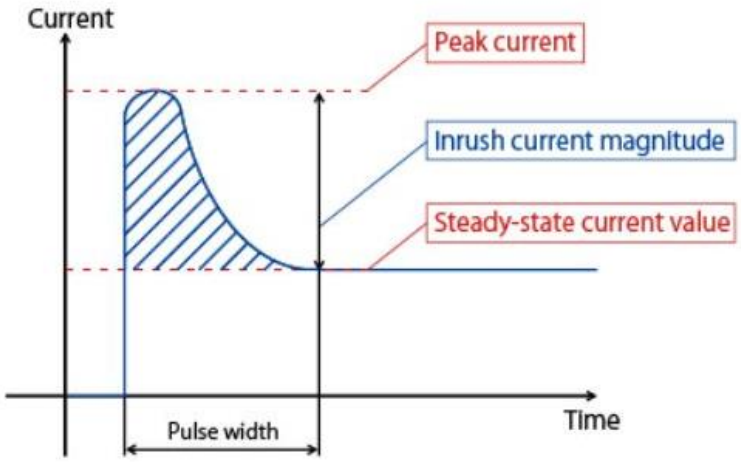
- Control testing conditions were not well explained in this report such as ambient temperatures ranges, and in particular the type of load the meter accuracy was compared to.

    - Resistive loads such as light bulbs with standard incandescent bulbs (linear loads), versus CFL’s, Halogen, Switched mode AC/DC power supplies i.e. Home phone chargers, TV and appliance controls, LED’s and overhead florescent light with electronic ballasts (non Linear loads).
    - Inductive loads such as electric motors in refrigerators, washing machines air conditioners etc.
    - No discussion on how the AMI meters did the kWh calculation, since it is really not a meter, but is a computer, with peak samples not averaged over a fixed period of time? **Whatever your peak use is in a 15 minute window is what you get charged for the full 15 minute window**.

- What is very different in the AMI meter is the algorithm used to calculate the readings from the sensor into the indicated display. The analog meter is a type of “totalizing” meter just like a gas pump. The AMI meter is very different, typically using peak use as a basis for calculations over a fixed window of time. ( any peak in 15 minutes is used for billing the entire 15 minute window)
    - The AMI meter uses sensor data, which has to be averaged by a mathematical calculation, then registered into memory and on the LCD display.
    - The gas pump has a weights and measures standards sticker to assure the consumer they are getting what they paid for, there is no such concept on an AMI meter. ANSI standards are laboratory measurements under tightly controlled conditions and are inadequate for accounting for in the field variances for temperature and humidity.

# Meter accuracy and your bill

- The Navigant Report tried to explain the billing inaccuracies in Texas using complex mathematic explanations and reference to “degree” days, but the degree variance was typically within 10% year over year, yet this did not explain power bills increasing as much as 25%-40% higher year over year.
- Their test lab control setups were done at room temperature as shown in pictures in the report.
- There was no field test at various temperatures for accuracy, nor was there a test using electric motors, they only lab tested with incandescent light bulbs, two completely different load variables.




Electric Motor Current Draws are different than a light bulb

- There is a short .5 to .6 sec burst of current needed to start an electric motor, so a 5 amp rated motor may need 8-9 amps to get rotating up to rated speed.
- If the utility is measuring peak current and averaging this over a window of time you can skew the average when you combine the two types of loads.
- Only the utility knows the math in the software.
- If you have an “Energy Star” refrigerator/freezer, it starts and stops frequently, and so the skew of the average is worse, imagine the impact on the average reading after 3-5 motors start and stop in the sample window.

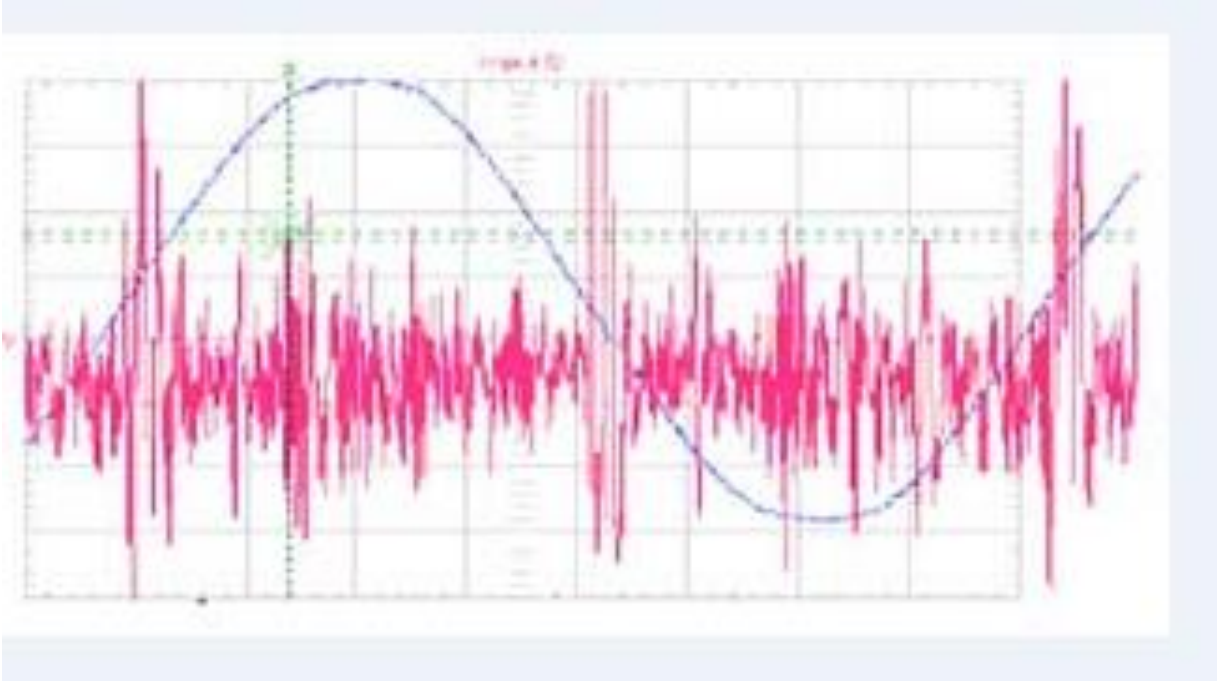
# Conducted Emissions “on the wire”

- **US FCC Title 47 Part 15.109 and International Standard CIPSR 32 Conducted Emissions (EMC and EMI/RFI)**

  - **The AMI meter, Opt-Out Meter (no RF) and various versions of the Electronic meters all currently exhibit spiked high frequency voltage transients and magnetic common mode currents backwards onto the home wiring system creating a huge antenna amplifying these transients and magnetic currents.**
  - **There is no way to “fix” the current design without a direct connection to an Earth Ground source and a circuit redesign.**
  - **An external fix at your service panel costs anywhere from $2,000 to $7,000 for UL approved filters.**
  - **Customer appliances are breaking down, especially any appliance with an electric motor or critical electronics including pace makers, CPAP machines and other life sustaining medical equipment .**
  - **People are getting sick from the both RF generating and the Opt-Out meters as the result of conducted emissions and common mode currents.**

# SMPS with Common Mode Filter – Principles You Need to Understand

The Standard Single Phase 60 Cycle/Second Waveform with EMI/RFI introduced by the SMPS



This waveform displayed is the same as an oscilloscope trace would look like, you cannot see this on a common voltmeter. Now we have introduced the effects of EMI/RFI via the SMPS to the same wire carrying the house current. This effect can be less depending on the environment, especially how good the house earth ground is magnetically coupling the house voltage currents Especially if they are using the water pipe as a ground reference which makes it worse. There are many variables that affect this waveform. The image in red should never be there, I have found this pattern consistent with every AMI meter, including the AMI meter with the radios off and the various digital meter alternatives. It is typically not compliant to FCC rules over all required frequencies for “conducted” Emissions Class A or Class B.

# The claim the meter meets FCC specs, maybe not true

Here is an example:
This the section of a report on a Sensus brand meter that is non compliant at 300 KHz note they are over spec for both FCC QP and AV Class B specs

I have the full reports of each example I present here. These are the parameters for “Conducted Emissions” not the RF 900 MHz transmissions

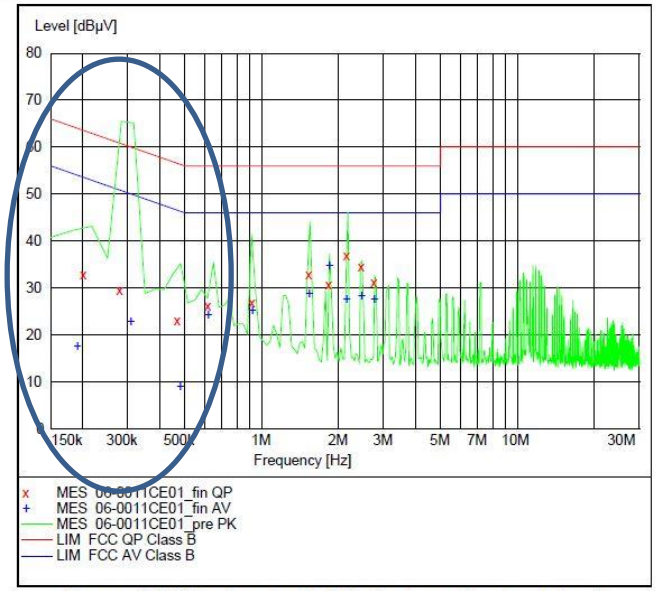


Figure 7.7.2-1: Conducted Emissions Graph – Line 1

# How does the utility get a non-compliant meter accepted as compliant?

Here is an second example:
The previous section of a report on the same Sensus brand meter that is non compliant at 300 KHz where they are over spec for both FCC QP and AV Class B spec. They then submitted a second report to the Iowa Commission for the same meter a report that obviously “Cherry Picks” the data points avoiding the 300-320 KHz frequency range to make it appear to be compliant. They avoided the graph shown in the previous chart. I find this be a common ploy in submission for approvals to state commissions. Since the meter companies pay the certification service they can be easily influenced to create a report favorable to outcome the meter company desires.

Zigbee, S/N 33 065 394

| Frequency (MHz) | QuasiPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 2.064750 | --- | 15.19 | 46.00 | 30.81 | 1000.0 | 9.000 | L1 | OFF | 9.8 |
| 2.064750 | 27.11 | --- | 56.00 | 28.89 | 1000.0 | 9.000 | L1 | OFF | 9.8 |
| 2.154750 | --- | 12.94 | 46.00 | 33.06 | 1000.0 | 9.000 | L1 | OFF | 9.8 |
| 2.154750 | 24.10 | --- | 56.00 | 31.90 | 1000.0 | 9.000 | L1 | OFF | 9.8 |
| 2.699250 | --- | 11.95 | 46.00 | 34.05 | 1000.0 | 9.000 | L1 | OFF | 9.8 |
| 2.699250 | 21.12 | --- | 56.00 | 34.88 | 1000.0 | 9.000 | L1 | OFF | 9.8 |
| 13.697250 | --- | 21.20 | 50.00 | 28.80 | 1000.0 | 9.000 | L1 | OFF | 10.4 |
| 13.697250 | 26.80 | --- | 60.00 | 33.20 | 1000.0 | 9.000 | L1 | OFF | 10.4 |
| 14.320500 | --- | 25.23 | 50.00 | 24.77 | 1000.0 | 9.000 | L1 | OFF | 10.4 |
| 14.320500 | 30.20 | --- | 60.00 | 29.80 | 1000.0 | 9.000 | L1 | OFF | 10.4 |
| 15.987750 | --- | 17.86 | 50.00 | 32.14 | 1000.0 | 9.000 | L1 | OFF | 10.6 |
| 15.987750 | 28.04 | --- | 60.00 | 31.96 | 1000.0 | 9.000 | L1 | OFF | 10.6 |

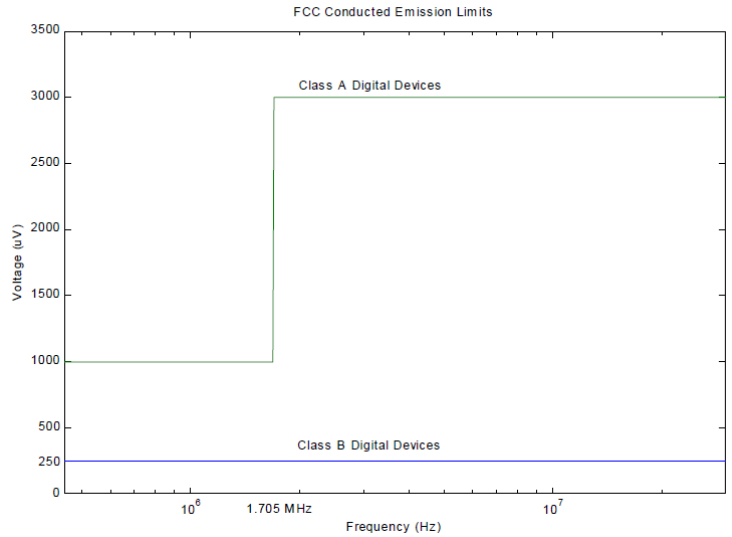
Line 1: AC Mains

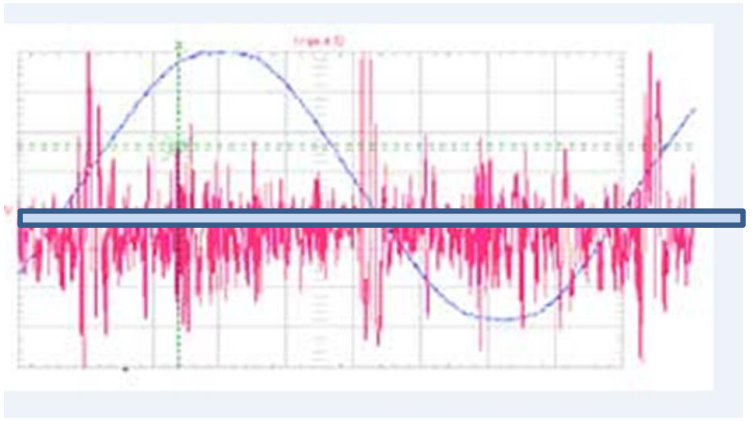
| Frequency (MHz) | QuasiPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Filter | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 0.357000 | --- | 17.60 | 48.60 | 31.00 | 1000.0 | 9.000 | N | OFF | 9.7 |
| 0.357000 | 26.57 | --- | 58.63 | 32.06 | 1000.0 | 9.000 | N | OFF | 9.7 |
| 0.379500 | --- | 15.99 | 48.12 | 32.13 | 1000.0 | 9.000 | N | OFF | 9.7 |
| 0.379500 | 24.34 | --- | 58.15 | 33.81 | 1000.0 | 9.000 | N | OFF | 9.7 |
| 0.640500 | --- | 13.72 | 46.00 | 32.28 | 1000.0 | 9.000 | N | OFF | 9.7 |
| 0.640500 | 23.18 | --- | 56.00 | 32.82 | 1000.0 | 9.000 | N | OFF | 9.7 |
| 1.329000 | --- | 17.67 | 46.00 | 28.33 | 1000.0 | 9.000 | N | OFF | 9.8 |
| 1.329000 | 25.90 | --- | 56.00 | 30.10 | 1000.0 | 9.000 | N | OFF | 9.8 |
| 2.064750 | --- | 17.08 | 46.00 | 28.92 | 1000.0 | 9.000 | N | OFF | 9.8 |
| 2.064750 | 27.38 | --- | 56.00 | 28.62 | 1000.0 | 9.000 | N | OFF | 9.8 |
| 2.103000 | --- | 16.52 | 46.00 | 29.48 | 1000.0 | 9.000 | N | OFF | 9.8 |
| 2.103000 | 26.25 | --- | 56.00 | 29.75 | 1000.0 | 9.000 | N | OFF | 9.8 |

Neutral: AC Main

# AMI meter without Common Mode Filter – Principles You Need to Understand

The Standard Single Phase 60 Cycle/Second Waveform with EMI/RFI introduced by the SMPS




The image in red is for both AMI meters (with the radios on or off) and the various forms of “Electronic Meters." They are not compliant to FCC rules for “conducted” Emissions Class A or Class B. Shown here are the limits for CONDUCTED emissions not Radio Emissions, which is a different specification, which are being fed back into the home wiring at the load panel. This is placing stress on all electronics and electric motors in the home, causing early appliance motor failures, appliance electronic control failures and radio interference, in addition to health effects such as insomnia, tinnitus, headaches, high blood sugar levels and nervous disorders such as neuropathy and heart arrhythmia. In order to become compliant the meter manufactures would have to scrap the current SMPS design, and include one that connects to an earth ground path to sink the oscillations to the home ground rod.

# What can be done to remove conducted emissions within the meter?

- A complete redesign of the SMPS board to include UL and FCC specifications for "conducted" emissions of EMC/EMI/RFI and stray common mode magnetic currents.
- Inclusion of common mode filter components.
- Inclusion of a direct connection to an Earth Ground to “Sink” the Conducted Emissions directly to ground.

# Summary