"Smart" Meter and Grid Deployment in Florida

Prepared by CHASM (Coalition for Health, Against Smart Meters)
http://microwavechasm.org/, February 2013

Introduction

Through the Federal Energy Acts of 2005 and 2007, Florida utilities (electric, water and gas) are constructing what they call the "smart" grid, an infrastructure separate from the electrical power grid that consumes considerable energy for its functioning and makes the power grid vulnerable to cyber-attack. This project, which increases and does not decrease net energy use, replaces well-performing, secure analog (mechanical) meters with hackable, two-way transmitting, "smart" meters on customers' homes and offices without consent. The meters, hereinafter "s-meters", lacking the normally required calibration and UL-certification, produce utility readings that are unverifiable and that have often been proven inaccurate.

S-grids and s-meters can be configured in different ways: power line installations, wireless mesh networks and fiber-optic connections. But all s-grid-related installations pose health and safety risks by way of the pulsed radiofrequency /microwave (RF/MW) radiation they deploy and the dirty electricity (transients) they produce in wiring. In addition to the potential for interference with electronic medical devices, such has been well documented by Howard Bassen PhD of US Food and Drug Administration (FDA)[1], interference with human and animal internal organ function, especially with nervous system signaling and cardiac rhythm, is well established in the scientific literature. Pulsed radiation, such as s-meters and s-grids deploy, is known to produce more bioeffect than does continuous wave; and the wavelengths deployed for s-meters maximize radiation absorption in the human head and brain.

Improper s-meter electrical connections frequently cause electrical fires with potential for permanent damage to home and office electronics. The system's hackability renders s-metered homes and offices vulnerable to criminal activity. Indeed, former CIA director James Woolsey said this system should not be called "smart" but rather "stupid". It opens homes, offices and the entire power grid to cyberattack.

Furthermore, all s-meters undermine home and office privacy and cause the incurrence of warrantless search and seizure, a Fourth Amendment violation. By way of the meters' Zigbee chip, they are capable of extracting detailed voltage transformation information. This can identify which appliances or devices are being used during which time periods and over which durations. All these data are stored permanently at utility offices, and are in turn vulnerable to hacking and unauthorized redistribution and sale.

"Approval" Process

There exists no Federal or Florida State legislation that mandates the deployment of s-grids or s-meters. The Federal Department of Energy granted $4.5 Billion in funds to certain utilities by way of the Stimulus Act to facilitate s-grid and s-meter installation, but did not mandate them. The language of the Energy Act of 2005 provides only that s-meters are to be "offered" to utility customers. The word "customers" in this context holds a meaning that varies from common usage; since no property owner or renter in Florida has the right to refuse an electrical power-grid connection. Thus, at least with regard to electricity, being a "customer" is a status coerced by State law.

[1] Bassen HI. RF Interference (RFI) of medical devices by mobile communications transmitters, in *Mobile Communications Safety,* Ed. Kuster, Balzano and Lin, Chapman & Hall, London, 1997 and http://ewh.ieee.org/soc/embs/comar/interfer.htm. Dr. Bassen states: "Hundreds of incidents of RFI induced medical device failure have been reported, studied, and summarized... The consequences have ranged from inconvenience to serious injuries and death. However, many more incidents may occur that are not reported because most users of medical devices are unaware that RF fields are present when problems are recognized and because of the intermittent nature of the failures that could cause them to be unobserved."

The Florida Public Service Commission (FPSC), presiding over Florida utilities, has held not even one public hearing on s-grids and s-meters, despite the enormity of their impact, both actualized and potential, upon all Florida residents and businesses. Again, there is no State mandate for s-grid/meter installation.

FPSC members failed to attend their own September 20, 2012 FPSC "workshop" (not public hearing) on s-meters (not the s-grid). FPSC aides opened the meeting by asking the utilities, "What jurisdiction does the FPSC have over smart meters?" One might wonder in response, "Who is regulating whom?" Were this not astonishing enough, on January 14, 2013, FPSC issued an order granting FP&L authority to self-regulate – as if FPSC had authority to shirk its own duties. Motions to reconsider this order have been submitted.

During the September 2012 discussion, the corporation Florida Power & Light (FP&L), a subsidiary of NextEra Energy, referred to a rate-case document wherein FPSC approved the inclusion of $101 Million in costs of purportedly obsolete analog meters in rate recovery. Notably, FP&L cited no complaint about or dysfunction of analog meters. According to FP&L, a *rate case* implicitly "approved" behind the public's back something entirely different: the statewide deployment of s-grids and s-meters. However, there was no forum for vetting such deployment, nor apparently even any discussion of it, in the said rate case. And who would ever approve of the strapped Florida State paying the cost of removing and destroying perfectly good utility meters? Given such funding parameters, it is not surprising there was no advance public disclosure of s-grid and s-meter deployment in the "Sunshine State".

Measuring Meter vs. Network Management / Communications Equipment

In providing services to the public, utilities typically have easement agreements with the customers. This easement provides that the utility have the right to enter the property to maintain, repair and replace their equipment. In the case of electric service, a customer has a meter box in which the utility places a meter to measure usage for the purpose of billing the customer properly. Where there is no mandate for a specific type of equipment, a utility lacks authority through an easement to place just any and all equipment it wishes in the customer's meter box, particularly where the equipment is known to do more than measure usage, and to be inaccurate in measurement, the sole purpose of metering.

With a lack of calibration and fire hazard, the imposition of RF/MW radiation and dirty electricity into homes, offices, their occupants and nearby wildlife, s-meters are positively inferior to the prior, analog meters. Particularly with the absence of need for any removal of analog meters, the forced change to customers' bill calculation methodology represents a forced contractual change, which each customer positively has the right to refuse. Indeed, the State of Florida, knowing what it knows, should be the entity to demand an immediate halt to s-grid and s-meter deployment.

S-meters do not merely measure utility usage. They function as part of a wireless mesh network to relay messages through adjacent meters to a collector meter (access point), functioning as network-management and communications equipment. In California, through a court order, and in response to customers' RFR measurements, Pacific Gas & Electric was forced to reveal the number of transmissions that its s-meters were producing daily. The following chart was provided for this data request. It clearly shows the very different functionality of s-meters, one that exceeds the analog meter contract. The demand for meter communications up to *190,000 times per day* demonstrates that the s-grid / s-meter system is not even primarily purposed for utility usage measurement. (Note: This does not include transmissions from the second radio, called the "Zigbee".) Thus utility "monitoring" by s-meters exceeds utility usage "measuring" by analog meters.

TABLE 2-1

Electric System Message Type	Transmission Frequency Per 24-Hour Period: Average	Transmission Frequency Per 24-Hour Period: Maximum (99.9th Percentile)
[a]	[b]	[c]
Meter Read Data	6	6
Network Management	15	30
Time Synch	360	360
Mesh Network Message Management	9,600	190,000
Weighted Average Duty Cycle	45.3 Seconds[4]	875.0 Seconds

Health Hazard

S-grids and s-meters harm the public health and the environment, producing two-way transmissions of RF/MW radiation, and imposing involuntary exposure of such within and outside homes and offices. Many meter boxes are adjacent to sensitive living areas such as bedrooms and kitchens, and work areas, e.g., utility rooms and garage workshops, in addition to frequented outdoor areas, where the public and any pets, wild animals and all plants are subject to 24/7 RF/MW radiation exposure.

While declining to represent the s-grid and s-meters as "safe", the Florida utilities and State agencies hide behind US FCC guidelines. FCC has no authority over or expertise in health; and its guidelines are not safety standards. The oft-touted guidelines are not based in the scientific RF/MW radiation bioeffects literature, but rather in an industry-owned international group's (ICNIRP's) recommendation. They are officially asserted to protect against secondary effects, called "thermal" effects, but not to protect against the more important and often immediate *direct* effects upon humans and other biologic organisms. Clearly they protect against neither; since, for example, a cell phone held to the head can produce unregulated hot spots.

In 2002, the US Environmental Protection Agency (EPA) stated, when questioned on FCC guidelines:

- " The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-ionizing Radiation Protection, are thermally based, and do not apply to chronic, non-thermal exposure situations."
- "The FCC's exposure guideline is considered protective of effects arising from thermal mechanism but not from all possible mechanism. Therefore the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified."

The American Academy of Pediatrics, in a December 12, 2012 letter of support to Rep. Dennis Kucinich for his "Cell Phone Right-To-Know" Bill, stated, "It is essential that any new standards for cell phones or other wireless devices be based on protecting the youngest and most vulnerable populations to ensure they are safeguarded through their lifetimes."

In a letter of April 2012 to FPSC, the American Academy of Environmental Medicine stated regarding s-meter deployment, "Current FCC guidelines are inadequate for use in establishing public health standards".

In May 2012, the World Health Organization placed RF/MW radiation on its Class 2B carcinogen list.

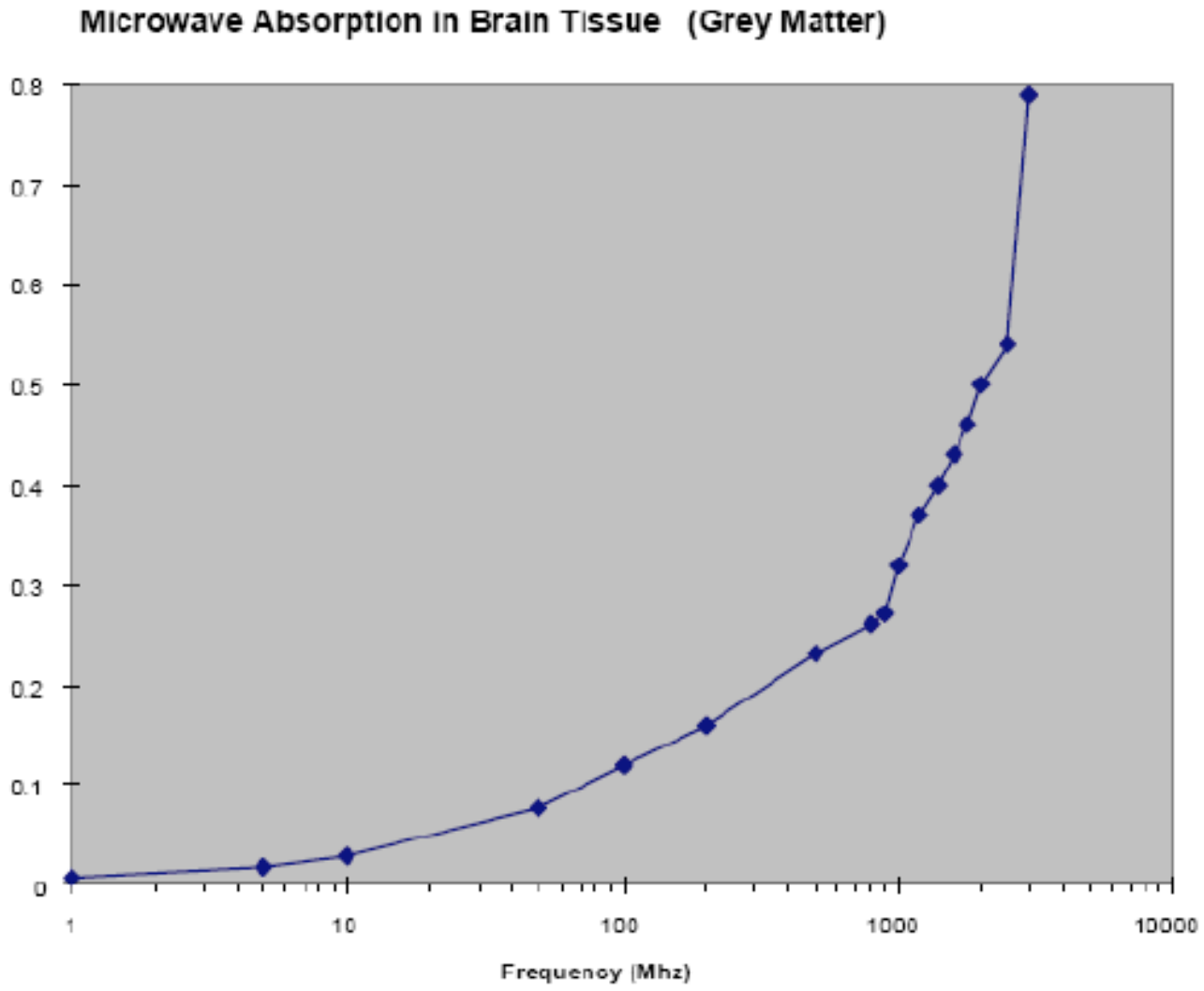
At the request of Rep. Kucinich, the US General Accounting Office (GAO) performed an audit of FCC's RF/MW radiation guidelines and in July 2012 issued a report stating, "The Federal Communications Commission's RF energy exposure limit may not reflect the latest research, and testing requirements may not identify maximum exposure in all possible usage conditions." The GAO directed FCC, which admitted it does not have health-safety expertise and relies on other agencies for advice, to review and update its guidelines.

The latest, largest review of the scientific research, released December 31, 2012, http://www.bioinitiative.org/ involves 29 independent scientists and health experts from around the world. This Report concludes, "Bioeffects are clearly established to occur with very low exposure levels (non-thermal levels) to electromagnetic fields and radiofrequency radiation exposures," and says that biologically based public exposure standards are critically needed.

The Report specifically addresses s-meters in Section 24 (2012 Supplement), stating, "An urgent example for the need to address the lack of adequate public protection from inadequate safety standards for pulsed RFR exposures is the rapid, global rollout of wireless utility meters ('smart' meters for electricity, gas and water meters). Current safety standard calculations that rely on time-averaging of RFR almost *entirely dilute out the power density of RFR levels* that are delivered in millisecond bursts, but occur at intervals of every second, or multiple times per second when in use within a wireless mesh network." (Emphasis added.)

Further, “These meters, depending on where they are placed relative to occupied space in the home or classroom, can produce RFR exposure levels similar to that within the first 100 feet to 600 feet of a mobile phone base station (cell tower). In the not-so-distant future the plan is to have a wireless device implanted in every household appliance, which will communicate with the smart meter whenever electricity is being used. This will likely make the kitchen a major source of exposure to RFR.”

Issued in 1991 and rubber-stamped thereafter, FCC guidelines ignore tens of thousands of studies, most of them concluding adverse effects in humans, animals and plants. Some of these studies, from the 1920s to the present, observe harm at thousands and even millions of times lower intensities than FCC guidelines, especially where, as EPA pointed out, there is constant, 24/7 exposure. FCC guidelines fail to consider accumulated exposure and vulnerable populations, such as infants and children, elders, and persons with prior impairments, illnesses and injuries. Per the following graph by physicist William Curry PhD, the centimeter wavelengths chosen for s-meter and grid deployment, usually in the range of 900-2400 MHz, maximize absorption-per-exposure in brain tissue, which is another reason FCC guidelines cannot protect against this radiation.



Not surprisingly, public health scientists and physicians have observed that vulnerable persons and some previously healthy persons have had extremely adverse reactions to the onset of s-meter radiation in their homes and offices, forcing some to leave these locations. Their observations should alone suffice to produce a statewide moratorium. The addition of peer-reviewed scientific studies, such as were submitted onto the public record at the 2012 FPSC “workshop”, should ensure not only a moratorium, but a full and immediate removal of installed s-grid and s-meter equipment, as well.

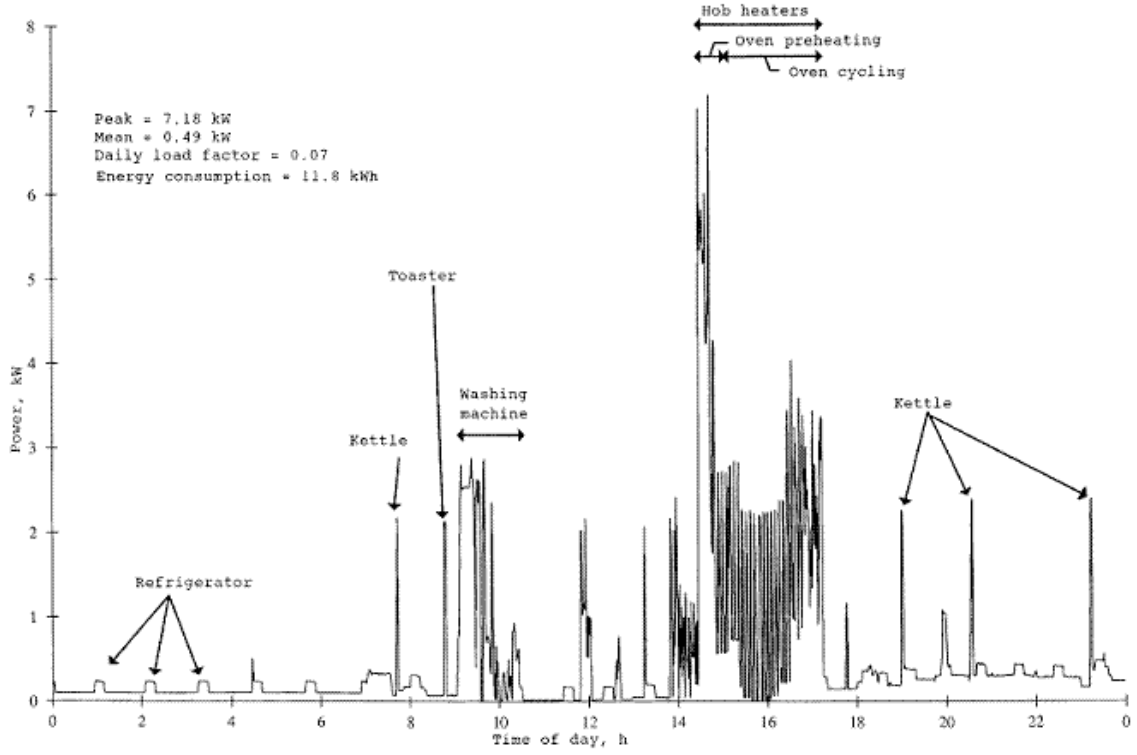
Privacy Violations

Proof of the s-meter and s-grid data retrieving capabilities can be found in a Congressional Research Services Report dated February 3, 2012 entitled “Smart Meter Data: Privacy and CyberSecurity”, http://www.fas.org/sgp/crs/misc/R42338.pdf

The report states:

> “Smart meters offer a significantly more detailed illustration of a consumer’s energy usage than regular meters. Traditional meters display data on a consumer’s total electricity usage and are typically read manually once per month. In contrast, smart meters can provide near real-time usage data by measuring usage electronically at a much greater frequency, such as once every 15 minutes. Current smart meter technology allows utilities to measure usage as frequently as once every minute. By examining smart meter data, it is possible to identify which appliances a consumer is using and at what times of the day, because each type of appliance generates a unique electric load “signature.” NIST wrote in 2010 that “research shows that analyzing 15-minute interval aggregate household energy consumption data can by itself pinpoint the use of most major home appliances.” A report for the Colorado Public Utilities Commission discussed an Italian study that used “artificial neural networks” to identify individual “heavy-load appliance uses” with 90% accuracy using 15-minute interval data from a smart meter. Similarly, software-based algorithms would likely allow a person to extract the unique signatures of individual appliances from meter data that has been collected less frequently and is therefore less detailed.”
>
> By combining appliance usage patterns, an observer could discern the behavior of occupants in a home over a period of time. For example, the data could show whether a residence is occupied, how many people live in it, and whether it is “occupied by more people than usual.” According to the Department of Energy, smart meters may be able to reveal occupants’ “daily schedules (including times when they are at or away from home or asleep), whether their homes are equipped with alarm systems, whether they own expensive electronic equipment such as plasma TVs, and whether they use certain types of medical equipment.” Figure 1, which appears in NIST’s report on smart grid cybersecurity, shows how smart meter data could be used to decipher the activities of a home’s occupants by matching data on their electricity usage with known appliance load signatures.”

Figure 1. Identification of Household Activities from Electricity Usage Data
Unique Electric Load Signatures of Common Household Appliances



In addition, a review of the National Association of Regulatory Utility Commissioners (NARUC) presentations at its regular meetings admits the need to consider privacy and security issues for s-meters. NARUC adopted Resolutions on Smart Grid Principles on July 20, 2011: http://www.naruc.org/Resolutions/Resolution%20on%20Smart%20Grid%20Principles.pdf

The public will likely never know what exact information companies like FP&L retrieve from homes and offices; because once delivered, such private data would ironically be considered proprietary and the property of FP&L, yet could be used for malicious and criminal purposes. The FPSC had a duty to hold formal, public hearings on s-meters and s-grids and the NARUC Resolutions. A rate case, again, cannot be argued to have approved the statewide s-meter/grid deployment or more brazenly, the permanent taking of private home and business information into utility-corporation coffers. At the very least, were the s-meter/grid system lawful, which it is not, a formal order should have been issued by FPSC to set the parameters under which the utilities could operate.

Blackout in the Sunshine State: Harm to Floridians

The deployment of s-meters throughout Florida is a very expensive project that should have warranted its own docket and public proceedings; but this did not occur. FPSC was petitioned for "demonstration" projects early on, but there was no public review of the actual or potential harm to Floridians of a roll-out. FPSC and the utilities acted without authority.

As noted by the Office of Public Counsel (OPC) in its letter in response to the September 20, 2012 s-meter "workshop":

> "[T]o OPC's knowledge, no studies, analyses, or quantification of the benefits or cost savings from the implementation of smart meters exist at this time. OPC is still waiting on the promised cost savings benefits of smart meters to be realized and shared with its customers."

Of course, a cost/benefit analysis is irrelevant where harm to the public is known to occur. But even if no harm were expected and had not already occurred, s-grid and s-meter deployment is untimely, since the people's representative has not seen a cost/benefit analysis. Connecticut's Attorney General argued against deployment in that state because pilot tests showed that any benefits do not justify the cost, and that there was *no benefit to customers*. Thus FPSC, in so far as it might admit to an approval of deployment, made it in advance of due diligence and public hearings.

By contrast, Clay Electric Co-op did its own analysis. It found installing and maintaining the network of no economic benefit to their ratepayers. This company will not install any such equipment unless the Federal government mandates it to do so. It honors anyone's request to opt in, per the Energy Act of 2005. This info was relayed from the Head of Operations, Howard Mott, and Head of Engineering, Herman Dyal, and further confirmed by the CEO's Administrator Laurie Keaton.

Thus FPSC is quite *ultra vires* in supporting FP&L. Furthermore, the FP&L asserts it cannot be held liable for damages caused by s-meters.

A review of the literature makes it clear that s-meters do not save energy; and the s-grid rather taps considerable energy from the already strained power grid. To quote one industry professional: http://www.smartgridlibrary.com/2010/01/04/connecting-the-smart-grid-dots-one-meter-at-a-time/

> "Those of us in the business understand that smart meters will save customers money on their utility bill as the grid evolves to residential Time of Use (TOU) electricity rates and Home Energy Management Systems (HEMS) are deployed".

But this requires that customers have the ability to use, and will use, electrical appliances in the middle of the night and not at prime daylight hours. So without a home management system, TOU rates, and reversed cycle of home and office activity, the State's investment will not yield the required results. The public has not been informed of this fact. One of the most effective ways to reduce energy usage and bills is to turn off most or all circuits by night. The electric companies do not inform customers of this easy energy-

and bill-reducing method. Their proposed system rather encourages energy usage at times when the usage is generally *not* needed. Worse, the 2005 Energy Act allows the expense of the s-grid, s-meters, associated equipment and its installation, to be passed along to the unwitting customers, who have been intentionally kept in the dark and see no acknowledgement in their bills that they are paying newly – and coercively – for infrastructure that was at once unnecessary and harmful to them.

A report entitled "*Getting Smarter About the Smart Grid*", was published in November 2012 by the National Institute for Science, Law & Public Policy (NISLAPP) in Washington, D.C. It states that billions of dollars in federal subsidies for "smart" utility meters have been misspent on meter technology that will not lead to energy sustainability or contribute to the possibility of a more efficient and responsive electric grid. Much of the multi-billion dollar federal subsidy for s-meters in the name of stimulus funding does not benefit ratepayers, nor support economic growth, but primarily benefits meter and meter networking manufacturers, while financially propping up unsustainable Investor-Owned Utilities (IOUs).

Cyberinsecurity

Building a wireless grid to transmit data means the data are hackable. All wireless networks are hackable. How much time and energy will the utilities need to spend on maintaining and fixing their system security? At present, home and office occupants have no legal recourse when their private data are compromised, nor can they even learn whether and how their private information has been taken or used.

Safety Violations

The fire hazard posed to homes and offices from s-meters, and damages to customers' electronic equipment, are well documented. What cannot be found is any consideration by FPSC of such damages and how the public is to be protected against them. There is no compensation for damages, when such events occur as a result of the installation of an s-meter.

Billing Inaccuracies

Since s-meters contain propriety-patented software as the mechanism to monitor usage, little is disclosed on how they function. Many customers have experienced increased bills following installation. FPSC put in place no safeguard to ensure that measurements would be accurate and would remain so into the future. Indeed, they cannot do so, since calibration is not an option. The customer pays for the extra electricity consumed by the s-grid and s-meter as the mesh network is monitored. Utilities have not disclosed whether those customers whose meters transmit the maximum transmissions, say 190,000 times per day, pay more than those whose s-meters are less active.

Opt-Outs are NOT the remedy

Since the September 2012 FPSC workshop on s-meters, and the submission of official demands by many Floridians for s-grid and s-meter moratoria and hearings, little has been done. Some customers have been told by utilities that an opt-out policy is being formulated by FPSC. In our view FPSC must not issue a policy with extortionary fees for opt-out or refusal. The Federal Energy Act of 2005 only allows utilities to "offer" s-meters, not to impose or otherwise coerce them. Customers who accept s-meters are effectively required by federal law to pay for their infrastructure, this by means of hidden fees that do not appear on their bills. Such billing constitutes a non-acknowledged, forced contractual change. Clearly, every customer and the public at large have a fundamental right to refuse s-meters and s-grids and their radiation.

Even if one were to accept opt-out fees, opt-outs do not provide remedies against public health, environmental, fire and other hazards. They especially fail to protect multi-family dwelling customers, business customers with more than multiple nearby meters, and other, non-customer occupants. Nor do they protect vulnerable populations and the environment.

All humans, animals and plants are electromagnetic beings. Some are more sensitive than others, often by way of prior electromagnetic injury such as shocks or lightning strikes, or simply by prior exposure to wireless devices or infrastructures. Sensitized persons are referred to as electromagnetically sensitive (ES). Even certain chemicals such as pesticides can injure the limbic system into a "kindled" state, which can render a person more reactive than others to RF/MW radiation. These persons tend to become even more impaired, and permanently so, when exposed to RF/MW radiation in and around their homes. Typically, they avoid wireless and other electronic devices, citing suffering of various forms when exposed.

Due to the wide range of s-meter emissions, which penetrate homes and offices, such vulnerable persons are subject to high-level bursts (pulses) of energy, even if they refuse s-meters and are *allowed* to refuse them. Unless all neighbors also successfully refuse AND the nearby transmitters for the s-grid are removed, these sensitive persons will continue to have s-grid and s-meter RF/MW radiation penetrating their homes, offices and bodies, causing them mild to extreme physical suffering.

ES is a functional disability under the Americans with Disabilities Act, one that can considerably decrease the person's capacity to participate in society and even to be functional and not bedridden at home. Society has a strong interest in keeping people functional, in avoiding making people newly or more ill, and in ensuring that others such as family members will not be required to provide care in the event of preventable injury, illness or impairment.

Occupants of multi-family dwellings and offices with a bank of meters adjacent to their living quarters (e.g. behind their bedrooms) or near office cubicles can at best refuse only one meter – their own – and only if they are bill payers. Where there are installed, say, 35 meters behind a bed or crib or next to an office desk, an opt-out can leave such persons with another 34 meters still simultaneously deploying high-level bursts of RF/MW radiation directly into their bodies at a rate of many pulses per second. This can quickly injure even a healthy person into a state of ES and other states of impairment and disease.

Additionally, opt-outs do not address privacy and Fourth Amendment (warrantless search and seizure) violations. Nor do they provide for the need for laws to stop private data from being culled of customers and other residents and occupants.

Summary

With regard to s-meters and grids, the public voice is not represented and even actively silenced. The Florida State and Federal governments are spending enormous amounts of money on deployment, with these costs then surreptitiously passed along to customers and taxpayers. Yet there is no public benefit and considerable and unprecedented public harm from this deployment. Health and environmental hazards and safety problems resulting from s-grids and s-meters are substantial, as are contractual, privacy and Fourth Amendment violations. Moratoria against s-grids and meters, and public hearings to address these actual and potential injuries of the public, are urgently needed. The major media seem to have blacked out coverage of these critically urgent matters. CHASM requests that conscientious Floridians help us to get the information out into the open and resolved.