

AMI Hazards and Remediating One's
Home From Them
*Testimony of Ken Gartner for MA DPU Dockets 21-80,
21-81, 21-82*

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After reading the Utility responses to the DPU dockets, it seems prudent to review the key health hazards of the current AMI. As many residents await a low-cost electromechanical opt-out to be actualized, in this testimony I describe some home measurement and remediation strategies that could be followed meanwhile.

Respectfully submitted.

Author Biography

Mr. Gartner received a BSEE degree from MIT in 1987 and worked as both a hardware engineer and software developer for more than three decades. Now semi-retired, his world was rocked when his partner became Electrically Hypersensitive in 2019, immediately after moving into their newly constructed home, which had an RF broadcasting smart meter positioned to irradiate part of the home. Only after taking steps to remove all RF radiators plus shield the AMI meter did the crashing health stabilize. Now, three years later, the electrical sensitivity persists and everyday life remains challenging. Mr. Gartner now earnestly studies the entire scope of environmentally-induced electrical sensitivity—the origins, the remediations, the effects, and the paths to permanent recovery.

This written testimony represents Mr. Gartner's personal opinion, as an informed and engaged citizen of the Commonwealth.

General Discussion

The Utilities explain many of the key reasons why an AMI infrastructure is an important consideration for a 21st century energy infrastructure. But the proposals fall far short of what many people seek—that is, a frank acknowledgement that there are some human health demerits in the current system and a strong willingness to address those issues in a timely and mutually agreeable manner.

Owning Up

The amount of scientific and anecdotal information about the harms of RF radiation are indisputable and continued inaction on this point should more thoroughly have the attention of corporate legal counsel. The scientific and anecdotal information about the of EMI emanated in the biologically active ranges of 3kHz to 150 kHz is not as well developed, but does exist. If someone's health immediately improves when the only change made was to remove or quiesce the AMI meter, that has to be given significant credence. Any health hazards offered by the AMI meters are the responsibility of the Utilities, who did not perform proper health testing and have ignored feedback of this topic for many years. To do anything but own up to this responsibility now, is craven and unbecoming of an entity holding the public trust.

The Quick Fix

The great news is that National Grid has 900,000 AMR-augmented electromechanical meters in the field that are scheduled to be replaced with AMI in the near term. The meters are ALREADY in the field and are working. Once the AMR RF-broadcasting module board is removed and the meters

calibrated/sealed, these 900,000 electromechanical meters **can be transferred from the waste stream into the residents homes across MA as opt-outs** that could last for at least a decade while the proper long-term solution is provided. Then all that is needed is a relatively simple piece of software to allow people to upload photos or text their meter readings frequently enough that estimated billing can be done. **Problem solved** without fuss and people can meanwhile continue work on restoring their health.

Specific Responses to the DPU 21-80, DPU 21-81 and DPU 21-82

Response to DPU 21-82 (Unitil)

This was a disappointing filing as it consists of only a few pages to say that Unitil meters and other AMI internal infrastructure do not employ RF broadcasting antennas and thus a waiver was sought. This might be a valid statement, [though in 2006](#) Unitil introduced the [TS2-MultiUtility meter](#) which reads 'short hop' RF from Electric and Water meters and in 2020 Unitil said it was converting over to PLX and that implies that there are at least some customer still using a smart meter complex (power, gas and water) that **does** employ some RF signalling technology, though not to broadcast.

On paper, replacing RF broadcasting with a power-line communication strategy **should** be a laudable implementation and a relief for the RF-sensitive folks. But, again, insufficient health testing was done beforehand and there are "unexpected" biological side effects. This area has received very little study so we do not know if this is merely extreme discomfort to some, or whether it is as biologically injurious as RF radiation. It's been 15 years since the Unitil first deployment of PLC technology.

The Power Line Carrier system, by design, creates electrical noise on the power lines serving all home in the service area. This noise contains useful info for Unitil, but it would appear as noise on the line (EMI) in the frequency range from 3kHz to 150+ kHz (these are bio-active). Several hundred houses placing their PLC signals on the common AC power lines produce a noisy input line to the home, which is telegraphed onto all of the wires of the house, in addition to the SMPS EMI created by the power supply for those meters. The combination of the two has deleterious human health effects, and some residents will clearly want to not be harmed further.

Unitil PLC/PLX meters create these hazards and it is unethical to charge any fees when persons wish to no longer be harmed by them. If Unitil insists on inflicting these harmful frequencies to everyone in their service area, then they should consider offering a house wiring filter to eliminate those frequencies they are responsible for, [as was done in Sweden](#), at the Utilities' expense.

The Considered Testimonies

This response was informed by the following Utility testimonies for this docket.

Table 1. Primary Filings Referenced (from Utilities)

Utility	Author	Date	Control#	Title	URL
Eversource	Jennifer A. Schilling, et al	07-1-2021	ES-AMI-1	DPU 21-80 Testimony	DPU URL
National Grid	National Grid	07-1-2021	NG-AMI-1 through NG-AMI-8	DPU 21-81 Testimony	DPU URL
Unitil	Gary Epler	07-1-2021	CSVG-1	DPU 21-82 Testimony	DPU URL

AMI Hazards Overview

Please Restore What Worked Well

There are numerous hazards associated with AMI metering. In order to avoid these hazards, residents would like a SAFE opt-out choice (as is requested in MA Senate bill S.2011). Note that in all cases, an Electromechanical meter is an excellent choice that does not offer any of the hazards listed. All that is being sought is to restore the service that had previously been available for decades, not anything novel. The new technology was introduced without adequate health testing and this request to restore the pre-AMI situation should have been anticipated from the outset per some prudent risk-assessment done by the Utilities and the DPU.

Engineers Know Little About Human Health

Many of these AMI hazards are endemic to the design of the metering hardware and software. Such hazards were not capriciously introduced, but have crept in partially because electrical engineers are never trained to appreciate any but the starkest biological health implications of their work. They are rewarded for their creativity to solve problems, but insufficiently guided to avoid the creation of different problems, many of which are subtle and very hard to test. They are constrained by standards organizations that are also insufficiently focused on any but acute human health consideration and remain slavishly devoted to incomplete mathematical models of how biology works. The hardware developers take "working" components and strategies then add to them, without ever considering that these components and strategies might have demerits which then are compounded by their creativity. They are driven by cost-containment strategies that force them to cut-corners to achieve schedules or pricing objectives, when they might rather have made more robust implementations.

Still, at the end of the day, such finished products are weighed based on the positive features they provide and the price-point achieved, and any negative feedback about isolated or long-term health ramifications can take many years to manifest, too long to have any impact.

If There Was Health Problem, We Would Have Been Told About It (Hint: You Were Told)

There is a steady mindset of 'disbelief' that any human could be damaged by environment factors that so many millions of people have been routinely exposed to for decades. Decades ago, the microwave spectrum was primarily a military technology and the effects of 'microwave sickness' from those over-exposed were well-documented, even if those documents might not have had wide public circulation. Today, those same biologically active frequencies bathe us in an electrosmog and

pressure our maladapted biology to cope with it. But there are many 'invisible' man-made hazards that assault daily life on this planet — pesticides, herbicides, insecticides, flame retardants, food colorings, infrasound, EMFs — and each has been shown to be injurious or deadly in abundance.

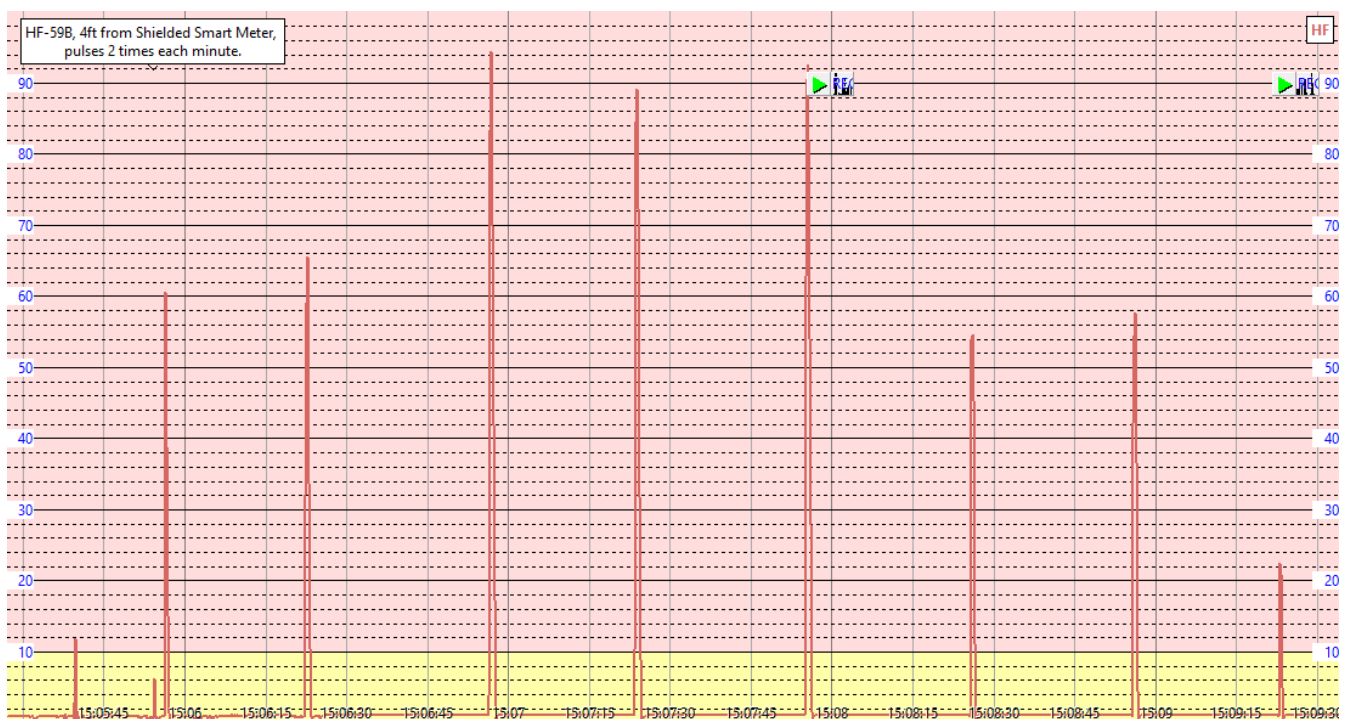
Showing that **some** people are significantly injured with even a small exposure doses has taken many years to surface to public awareness and yet even many health professionals remain uninformed on the topic. Even while the WHO, a very conservative agency, in 2011 classified RF radiation as a Class 2B agent (a possible human carcinogen), no slow-down of its public deployment was forthcoming — no warning labels appear on cell-phones or WIFI devices or radiating smart meters. In short, the public at large has been insulated from seeing the results of this mess, deny its existence, accuse sufferers of melodrama or fabricating their symptoms, and continue with their lives. Ignoring an inconvenient fact does not make it go away.

So Many Hazards

In order to focus only upon just the conducted electromagnetic interference (EMI) health aspects in this testimony, the following misfeatures of the AMI meters won't be discussed further.

- **Radio Frequency Transmission** - The RF health issues are multitude and covered in other DPU responses. Smart meters are rather 'dumb' — they blast their information broadly, using as much antenna strength as permitted by the FCC, instead of being tuned in any way to either aim the antenna (away from humans) or use a lower power transmission. This is 'air pollution' as much as any Class 2B possible carcinogen. Such devices could have been designed with telephone or wired networking, but the lower cost of RF deployments appeals to the shareholders, even at the expense of the residents of MA. So many missteps have been made here with AMI deployment, and do continue to be made with other 'internet-of-things' juggernauts.

RF frequency bursts on my iTron Centron AMI meter, twice per minute day and night



- **Privacy** - I can easily view the electricity usage for myself and my near neighbors, in real time, using a \$35 Software Defined Radio (SDR), a \$10 whip antenna and several open source

software packages. Such information is transmitted without any encryption every minute or so. I know which is mine because it matches the cumulative use shown on my iTron meter face. It would not take much sleuthing to learn which data packet belongs to which neighbor. It would also not take much monitoring to infer when no-one was home, based on an unchanging energy usage profile. Some people would strongly prefer that their own energy usage patterns not be publicly broadcasted.

- **Security** - The AMI meters support the capability to turn OFF power to a house. The security protocols are not openly available to study, so there is a genuine concern that a malicious person could send a signal that results in a power shutoff to a single house, or part of a neighborhood. In fact, fires in CA Smart meters coincided in numerous cases with the remote turn ON signal, so there is the possibility of setting a house on fire by manipulating this ON/OFF capability, or at least to stress the power grid. Any time networking is added to a powerful product, these risks arise.
- **Cost of ownership** - It has been [shown](#) by Electrical Engineer William Bathgate that AMI meters extract energy to power their operations and that for a house with all breakers turned off, there were still a few kilowatt-hours of energy used per day, amounting to about \$10 per month added to the consumer's bill [1: This is documented on pages 38-39].
- **Over Billing** - It has been shown by Electrical Engineer William Bathgate that [some AMI meters](#) use a different energy measurement calculation than the electromechanical meters did, which now includes an energy sampling method that may penalize devices which have impulse startup current. [2: Pages 39-49] This encompasses many common devices, such as variable-speed motors (minisplits, pumps, furnaces and even Energy-Star devices such as refrigerators) Such a method is controlled by software that is not publicly available for review. Many people have reported that their energy bills were higher immediately after installation of a smart meter. In some situations, Mr. Bathgate has seen power usage reduction merely by adding power line conditioning (to stifle the larger impulses and smooth out usage). To further confirm this in the long term, Mr. Bathgate runs a home with both an AMI and electromechanical meter in parallel to record the differences and true-up the over-billing quarterly with the local Utility.
- **House Fire** - Smart meters across the country have been implicated in house fires, although not in MA. The design of the smart meters makes this much more likely than for electromechanical meters because the former has a soldered board that may melt into a catastrophic failure and the latter has 'spark-gap' protection from over-current surges.

Understanding the Biological Hazard: EMI Conduction

Two Sources of EMI from AMI Meters

There are two EMI (Electromagnetic Interference, aka 'noise' or 'Dirty Electricity') hazards that are discussed in this section. One is the EMI that is impressed onto the wiring of the home due to the switch mode power supply (SMPS). The other is unique to PLC/PLX (Power Line Carrier, used by Unifit) , as the signalling appears as if it were EMI line noise which also indirectly impressed onto the wiring of the home. A typical home has 2000-3000 feet of wiring in the walls and floors and ceilings and such EMI will travel down all those lines and usually also radiates from them (ie, they can even be measured via an antenna).

Familiar Symptoms

Exposure to unrelenting low frequency voltage 'noise' has been seen to correlate with neurological symptoms such as anxiety, tingling in the extremities, restlessness, agitation, behavior and learning issues in children, pressure in the head, headaches, urinary incontinence, self-harm ideation and a host of others. We can be more sure about the acute relationship between such noise and human health because filtering out such signals can lead to a nearly immediate cessation of such symptoms.

EMI from Switch Mode Power Supplies (SMPS)

All Smart Meters Are Involved

All smart meters have electronic boards in them. Those electronic boards have digital components such as a central processing unit and similar signal processing as you might find in a cell phone. These can only run on DC (Direct Current) power, such as a battery. In fact, if the electronic circuitry contained in a smart meter was powered by a battery, you could avoid reading the rest of this section since there would be no conducted EMI generated. 'Smart' gas and water meters employ self-contained batteries so while they employ electronic circuitry, the generated noise is never impressed onto the home wiring and thus not a health concern. This is one of many implementation decisions that leaves us wondering whether anyone in authority **ever** thought about human health before deploying smart meters.

Note that the EMI hazard described in this section applies to **all** smart meters, not just those that generate RF, but also those 'opt-out' meters that have their RF disabled and also the PLC meters (from Unitil).

AC to DC Conversion Is Where The Trouble Starts

Since electronic boards need low voltage DC power and the only available source is 240V AC (Alternating Current) power from the Utility, the conversion is done by a device known as a Switch Mode Power Supply (SMPS). That sounds like an exotic feature, but you already have many of them at home—these are the various wall warts and power adaptors for your phones, computers, tablets, battery chargers and other small electric devices. In contrast to the bulky transformers from decades ago—which would get very warm and waste a lot of energy in the process—the SMPS are much more efficient. However, as a side effect of how they 'chop up' the incoming AC power into the smoother DC power (like a battery offers), they create a lot of extraneous voltage frequencies.

The incoming AC power is ideally 99+% a single 60 Hz sine wave. This is a bit of an oversimplification due to corruptive EMI generated by one's neighbors. The SMPS typically generates a 15-20 kHz primary frequency and then a progression of 'harmonics' (which are multiples of that primary frequency) which have successively less voltage amplitude. So any SMPS might generate a 15kHz signal and then a bit less at 30 kHz, then even less at 45 kHz and this goes on for a number of repetitions. Not every SMPS has the same characteristics so when each of one's devices are plugged in, there is a cacophony of such EMI noise.

Better Made Devices Minimize EMI Conduction

But there are two important points to note. The first is that it is not inherently the case that an SMPS power supply will corrupt the local wiring with its EMI noise. There are electrical interference standards that limit what a device is allowed to put onto the wires and the highest quality implementations work hard to eliminate this generated noise becoming impressed onto the power cord wiring. Such noise filtering can take many forms but in the case of a smart meter we would want to at least see a 'common mode filter'. This is a part that costs extra money (perhaps as much as \$5 per board [3: Look in either Bathgate reference, previously, for the common mode filter discussion.] and takes up some space, but this engineering best practice has been ignored by all smart meter implementation of which I am aware. Thus, **all** of the smart meters produce such conducted EMI noise, 24/7.

The second point to consider is that the smart meter occupies a unique position in your home wiring network. The typical unfiltered wall wart primarily pollutes just their local branch circuit with this EMI noise, with diminished contribution to the rest of the house. The smart meter touches the incoming power line from the Utility and so manages to corrupt all the wiring in the house.

EMI from Power Line Carrier (PLC)

What is Power Line Carrier (PLC)?

On the face of it, PLC is miraculous and economical. The premise is that by very carefully encoding digital information (such as your home current energy usage) and then applying it back onto the power lines, that signal packet will transmit miles along all the utility pole wiring until a very sensitive receiver owned by the Utility will decode it. By necessity, there is not much bandwidth available so there is no room for extra chit-chat. All of this is done in the brutal environment of the power transmission lines, through pole transformers, travelling in parallel with all the other signals sent from other homes as well as all the noise inherent from tree branches and other environmental assaults.

The Darker Side of PLC

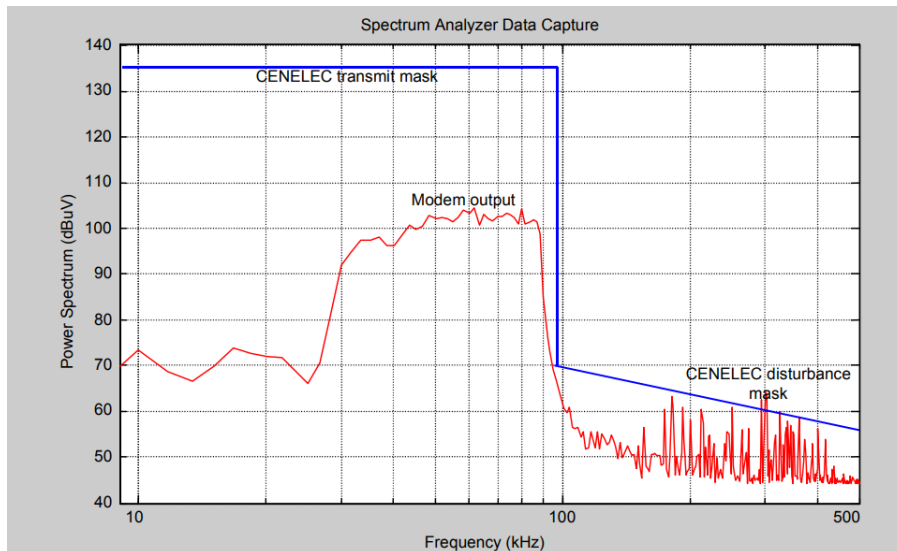
There is one demerit unique to the PLC implementation (available from Unitil) and that is that the PLC environment for an entire neighborhood will be dosed with intentionally generated 'noise'. Each home's energy information is transported to the Utility across the power lines — not via RF broadcast in the air, not via a hard-wired signal path such as fiber, ethernet or telephone.

One of the flaws in the system is that in a neighborhood with 100 homes, all sending their PLC data along the same wires, those incoming powerlines are always full of EMI noise. Even if a single home manages to opt-out and receive a safe electromechanical meter, the incoming AC is already polluted and will still travel the length of the home wiring.

Nuts and Bolts

The power companies have a reserved frequency band which they can use for their PLC activities, and it is generally in the range of 9kHz to 95 kHz [4: This is known as the CENELEC A band, based on a European standard]. As mentioned earlier a biologically active frequency range is from 3kHz to 150 kHz, completely encompassing the PLC meter's range. This is a good example of engineering standards organizations completely ignoring human biology. In the accompanying diagram [5: Figure 35 from <https://www.ti.com/lit/an/slla164/slla164.pdf>], a typical PLC modem will produce 100

dBuV (=100 millivolts) of noise on many frequencies in the biologically active region and this can be overmuch for someone with electrical sensitivity.



Employing EMI Noise Filtering as Part of Remediation

Human biology does not come with an operating manual. We learn what ails people first by anecdote and then formalize that using a scientific method, though the latter can take decades to crystallize. In the meantime, we collect the anecdotal experiences of people who have acute symptoms, and make note of which remediating actions proved successful.

Thank Your Local Canary

A reasonable assumption is that the small percentage of people who are 'early adopters' of environmentally induced health impingement — the 'canaries' — offer us valuable insight as to the underlying chronic effects which most people do not even notice. By accumulating such anecdotal information over a few decades and fortifying these with a scattering of scientific papers we have learned a few things about helping improve the home health environment. Acutely ill folks cannot wait for perfection; they need relief immediately.

A Holistic Analysis Yields the Best Results

In this section, I discuss remediation techniques that might offer relief when the offending EMI-producing smart meter source cannot be otherwise replaced with an electromechanical one. A person's symptoms may have multiple causes, so the best approach is always a holistic one that looks at **all** the environmental hazards (EMF, air quality, chemical exposure, environmental mold, food sensitivity, water quality, and so on). To be necessarily brief, I am only looking at remediations related to conducted wire EMI 'noise' or, as it is popularly known, "Dirty Electricity".

EMI Measuring Tools

Perfection Can Be the Enemy of Good Enough

Since conducted EMI is invisible, it is important to have a measuring tool to quantify the 'before' and 'after' readings so that the anecdotal information can be quantified and thus made more valuable when aggregated across many different situations. Since remediation can be a 'pay-as-you-

go' proposition, it is important to get a sense when 'good enough' has been achieved.

Yes, it is definitely unfair that you will have to pay real money to solve a problem that was created by the Utility (or other entity) and for which you have received no tangible benefit. Unfair, unfair, unfair.

Measurement Options

There are two classes of measuring instruments — those that are dedicated 'Dirty Electricity' meters and the more expensive and featureful Spectrum Analyzer. The Spectrum Analyzer is only usable by a trained person, such as a Certified Building Biologist, and I would caution anyone from spending large on EMI/DE filtration without proper spectral analysis. As far as dedicated DE metering, there are several brands—Stetzer, GreenWave, AlphaLabs, Satic—and each has its unique value. The venerable 'Stetzer Meter' has been around the longest, has been used the most, has been used in the most scientific research and so I will use that one in this discussion. The others can be used in a similar way.

A Stetzer Meter is a plug-in device and it costs less than \$150. You plug it into an energized wall outlet and the display shows a value in 'GS' units (Graham-Stetzer). This number is derived by looking at the 'biologically active' frequencies on the wire and quantifying the total amount of such 'noise'. Note that this will include ALL noise on the wire, not just the noise from the Smart Meter. Blaming that smart meter for its contribution to your home's wiring noise is premature until you resolve to address all the other heavy contributors (Hint: this can be a big effort, one you might want consultation for).

Performing EMI/DE Measurements

Start Simple

To best measure the DE contribution from the smart meter, turn off all the individual circuit breakers in the home, except for one that has minimal circuits on it, other than a normal electrical outlet - this is where you will plug in the DE meter. Unplug any other devices sharing the line to avoid skewing the measurement. An ideal circuit is something dedicated such as a washer or a refrigerator (remember to plug the refrigerator back in after you are done measuring!).

Looking at the GS unit value will tell you where you stand. Ideally, you will want to see a value below 50 for your entire house if there is an electrically sensitive person in the home OR the household is health-conscious about chronic stressors. Note, we are only looking at the smart meter, so a low value here does not mean your job is done, just that the smart meter contribution is rather small.

My Home AMI Meter EMI/DE Measurement

At my home, I have a National Grid iTron Centron watt-hour meter. When I perform the test of the smart meter EMI, I see that a value of about 100 GS units, though it varies from 80-110 over the course of a minute or two. This is probably because there is at least one intermittently running device among the neighbors that share the same utility pole transformer. Yes, the DE created by your near neighbors might add to your home's DE burden, especially from Solar PV, or variable speed pool pumps and HVAC equipment. So, in this test, I cannot say how much the Smart Meter contributes by itself because it is always measured in combination with any EMI already on the

incoming wires. Still, the externally sourced EMI is the one you have no control over so your only choice will be to 'filter' such.

Get a Pro in to Help

What happens if the value is several hundred or several thousand GS units, even in this small test? You are in need of a consultation because you are not going to solve this on your own.

As you turn on the rest of your circuits and devices, note which ones cause a significant rise in the EMI/DE meter reading. The usual suspects will be LED or CFL light bulbs or fixtures, but it might be something that is not so easily replaceable such as a computer or entertainment device. There are too many permutations to generalize a single strategy, but consider ways to keep such devices unplugged when not actively being used.

EMI Remediation Technique: Filtering EMI/DE

If you feel you must address the EMI/DE, then filtering is one of the more common options. In all honesty, some externally produced EMI/DE is so plentiful that you will either have to discuss with your neighbors how to reduce it, call the Utility to investigate in case there is actually a loose or rusted connection, check your wallet for what might be an expensive consultation and filtering purchase or move to a different home. The latter might be the better option for a renter.

What is an EMI/DE filter?

It is a device that either 'quenches' the excess voltage noise, or redirects it so that it leaves the house without traveling throughout the premises. Usually there are a number of passive components, such as capacitors, that help smooth out the higher frequency transients without adversely affecting the 60 Hz power. Filters are not a panacea; different filters have different capabilities and some might not improve your particular problem at all.

Filters come in several form factors

Whole house filtration is the most effective, but the most costly. A whole house isolation transformer is one of the most expensive (and rarely needed) remediations and that would cost close to \$10,000. Whole house filters might include other features such as surge suppression or are specifically geared to addressing EMI from Solar PV and they often are installed by an electrician into the main circuit panel under a dedicated circuit breaker, and can cost \$1000-\$3000.

Please note that it has been observed that setting up an effective whole house filter and surge suppressor can sometimes result in the PLC Utility (Unitil in MA) not receiving the usage info from your home. Somehow this interior cleanup of noise on the line, causes the sent signal to be garbled. This can be worked around by disabling the filter once per week for a few hours so that a reading can work its way through the system.

The least expensive are the wall plug-in units—from Stetzer, Greenwave, Satic and others, and they range in cost from \$30 - \$200 each. Wall plug-in do not require an electrician but they can sometimes worsen the health problems, especially when peppered throughout the home or there are wiring errors in the home (which is much more common than popularly thought).

One Size Does Not Fit All

In homes where there is an electrically sensitive person, it is **vital** to test how the person feels with each of the types of candidate filters plugged-in, before committing to a large purchase. It has been found that some people's biology strongly prefers one EMI/DE filter above another or strongly disfavors one. Perhaps this is because one quenches certain frequencies the others do not or perhaps one introduces other problems.

This is an artful enterprise and there is no guarantee that spending money on filters will actually result in symptom relief unless the proper ones are selected, deployed and confirmed. Again, we are only talking about filtering EMI/DE because there are many badly behaved electronic devices in our homes (including CFLs and most LED bulbs and fixtures in addition to the smart meter).

EMI Remediation Technique: Turning Off the Juice

EMF/DE 'rides' on the voltage that radiates into a room from the wall wiring and any plugged-in devices (whether they are energized or not). You can unplug devices when not in use, to reduce your health burden and acute discomfort. You can employ shielded power cords for lamps or other devices.

Yet, unless your wall wiring is encased in metal conduit or is actually metal clad cable (sometimes called 'armored' or 'bx'), then the AC wiring's electric fields will project into the room by at least 4-6 feet. The EMI/DE rides on those electric fields so the easiest way to distance a sensitive person is to turn off any of the circuit breakers that are in the 'sanctuary' space (often, at least the bedroom). That is, to maintain a space with zero AC electricity.

This is what we have done for a few years at our house and it supports the slow healing process from electrical hypersensitivity at no cost and only minor inconvenience. It helps when you design a new house to route the wires to accommodate de-energization. We think this is a great solution and both occupants have seen health benefits from the absence of any AC power in the bedroom, including unclouded thinking and improved memory.

EMI Remediation Technique: Shielding EMI/DE

Instead of completely turning off whole AC circuits in order to avoid exposure to wire-borne EMI/DE, an intermediate solution to block electric fields can be realized by the use of shielding materials—metal mesh, conductive foils and fabrics. These are often the same materials that can be used to block airborne RF, but one must always check the data sheet to see which frequencies are effectively blocked. The home decor options will broaden if conductive fabrics are considered instead of foil or wire mesh.

When pure metal sheetgoods are placed strategically against walls, ceiling or floors and then attached to an earthed rod, the voltage fields from the wires in the walls no longer extend into the room. This is easy to do in theory, but challenging to implement in practice because large exposed pieces of conductive material can, themselves, pose a safety hazard especially if the grounding source is tainted with stray currents or reflect microwave signals back into the space (such as if cell-phones or WIFI is used in the home).

Applied shielding needs to dovetail with your living habits and if you insist on using RF devices in the home, stick with the filtering option.

In Summary

Go Slow.

Always consider measuring before and after shielding or filtering so as to ensure not to worsen the situation. Note that circumstances change over time and it is best to own some appropriate meters to adapt.

I wish you good fortune to achieve a more healthful home and a more healthy family.