Tasmania's new electricity smart metering roll-out

Why opting out may be your wisest, and healthiest choice

Don Maisch PhD
www.emfacts.com
July 11, 2018

Overview

On December 1, 2017, the Australian Energy Market Commission's (AEMC) final rule determination, titled: "Expanding competition in metering and related services" came into force in Tasmania, SA, NSW, the ACT and QLD. The rule states that this is a framework which is designed to, "*promote innovation and lead to investment in advanced meters that deliver services valued by consumers at a price they are willing to pay. Improved access to the services enabled by advanced meters will provide consumers with opportunities to better understand and take control of their electricity consumption and the costs associated with their usage decisions,*"[1]

This rule came about as a result of a request from the Council of Australian Governments' (COAG) Energy Council that considered that the previous metering rule allowed and encouraged the continued installation of mechanical analogue meters, which they said had "only limited functionality".[2]

What this means is that over the next few years we will see a gradual replacement of the existing analogue electricity meters with so called advanced meters (also called digital or smart meters). These meters have the capacity to collect energy use data and send that back to the provider by a wireless network without the need for a meter reader going from house to house to collect that data. As for the uptake of advanced meters (smart meters), TasNetworks has estimated that presently (2017-2019) only about 4% residential and 12% small business customers have a smart meter. By 2024-29, it is expected that this will increase to 31% residential and 59% small business customers. By 2029-34, it is expected that all energy customers will have a smart meter."[3]

As a result of opposition to the mandated introduction of smart meters in Victoria, including concerns over possible health impacts, the new AEMC rule gives Tasmanians (and in the other states mentioned above), the right to opt out, by contacting their energy provider (Aurora in Tasmania), stating that they do not want a communicating smart meter.[4]

---

[1] AEMC, "Expanding competition in metering and related services", https://www.aemc.gov.au/rule-changes/expanding-competition-in-metering-and-related-serv
[2] ibid.
[3] TasNetworks Determination: the Tariff Structure Statement, Figure 2, p.8. https://www.aer.gov.au/system/files/TN-Tariff%20Structure%20Statement%202019-2024-PUBLIC.pdf
[4] The opt-out clause is covered in the AMEC report on pages 28-29: National Electricity Amendment (Expanding competition in metering and related services) Rule 2015 No. 12, http://www.aemc.gov.au/getattachment/4c772b03-b0dd-44c1-b6ed-bd6d46601f41/Final-Rule-%E2%80%93-NER.aspx

As mechanical analogue meters are no longer available, the opt-out provision obviously does not apply to new connections, homes undergoing major renovations requiring new wiring, homes having solar panels connected to the grid, faulty existing meters requiring replacing, and "maintenance" replacements where testing has indicated that an analogue meter is at risk of becoming faulty.

In these situations the only way the customer can avoid having a communicating smart meter installed on their premises is to notify by phone and in writing to Aurora that they wish to opt out and not have a wireless communicating smart meter (Type 4) but prefer a smart meter which is not enabled for wireless communications (Type 4A). Contact details are at the end of this paper.

Type 4 and 4A smart meters

The type 4 smart meter is read remotely via an inbuilt communications interface which transmits data in the radiofrequency (RF) spectrum without the need for a meter reader to come to the premises. It is only specified to store data for 35 days and is the preferred option for installation by the designated meter provider, unless prior notification otherwise is given by the building owner.

The type 4A smart meter also has a communications interface but it is **not** enabled for wireless communication and comes with the extended capacity to store 200 days of data, which a meter reader must download directly from the meter.

The roll-out in Victoria as a cautionary tale

NOTE: The Victorian smart meter rollout predominantly uses a mesh radio network which operates in the Industrial Scientific and Medical (ISM) band of 915 to 928 MHz with an output power of one Watt (1W).

However, in Tasmania the network will be using the 3G network (and possibly 4G as well) which uses the 830 MHz and 2.1 GHz band (for 3G – rural and urban areas) with an output power of 1.6 W. [5] Although much of the following information in this report is in relation to the mesh network and not 3G, consider:

- There wasn't supposed to be any health hazards from the mesh network but what transpired was a case of 'unintended consequences'. Will there also be unintended from 3G as well?
- A 3G smart meter operates at a higher power than a mesh meter: 1.6 W verses 1.0 W.
- A 3G smart meter can also transmit at frequent intervals. To quote in part from the Total Radiation Solutions report: "In practice, the meters (3G) are transmitting intermittently, perhaps often, throughout the day as well as and not simply just for the 4 main sessions." According to the TRS report, six 3G meters

[5] Total Radiation Solutions, Department of Economic Development, Jobs, Transport and Resources, Quantifying Smart Meter RF EME Levels in Victorian Homes, http://www.smartmeters.vic.gov.au/__data/assets/pdf_file/0009/1176696/AMI_Quantifying_smart_meter_RF_EME_levels_in_Victorian_homes_2015.pdf

were tested with pulses between 129 to 176,201 per hour. [6]

- The possibility therefore exists that a pulsing 3G smart meter located in close proximity to people, such as a bedhead, may also have unintended consequences.

In 2006 the Victorian Government mandated the roll out of smart meters throughout the state and in late 2009 the rollout began, predominantly with a mesh network. Soon, newspaper articles started to appear in the Melbourne papers about people who were claiming that ever since a smart meter was installed on their home, they were having health problems, primarily insomnia and tinnitus, especially when the meter was located close to the person's bedroom. In reply to these claims, the proponents of the rollout pointed out that the smart meter's transmissions for power consumption were very brief, only 4-6 times a day, and therefore not capable of causing any health effects whatsoever. However, although the above was correct for measuring power usage, there can be thousands of other brief transmissions not related to electricity usage and this was not being mentioned in the reports and fact sheets extolling the many benefits of switching over to smart metering.

This is clearly seen in Table 1, taken from a document from Pacific Gas and Electric Co. (USA) where, for a mesh network, over a 24-hour period up to 190,000 transmission pulses can occur.[7] A question was then raised: Is there something special about these transmissions that could somehow be adversely affecting some people?

To attempt to answer this question, detailed measurements were then undertaken of a typical Melbourne home that had a mesh network smart meter recently installed. As can be seen in Table 2 and 3, there are many brief but very frequent RF transmissions. This contrasts with what you see with an analogue electricity meter, which has no RF transmissions. The characteristics of the smart meter emissions therefore appears to be a new and unique human exposure situation where no research has yet been done as to its possible impact on health with prolonged exposure, especially at night.

Table 1

Electric System Message Type [a]	Transmission Frequency Per 24-Hour Period: Average [b]	Transmission Frequency Per 24-Hour Period: Maximum (99.9th Percentile) [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

Table 1 presents scheduled mesh network smart meter system messages and their durations. This is only for the 900Mhz smart meter transmitter radio and represents data for all scheduled messages that are required to sustain the mesh network communications.

[6] ibid, page 9

[7] Pacific Gas and Electric Co., http://emfsafetynetwork.org/wp-content/uploads/2011/11/PGERFDataOpt-outalternatives_11-1-11-3pm.pdf

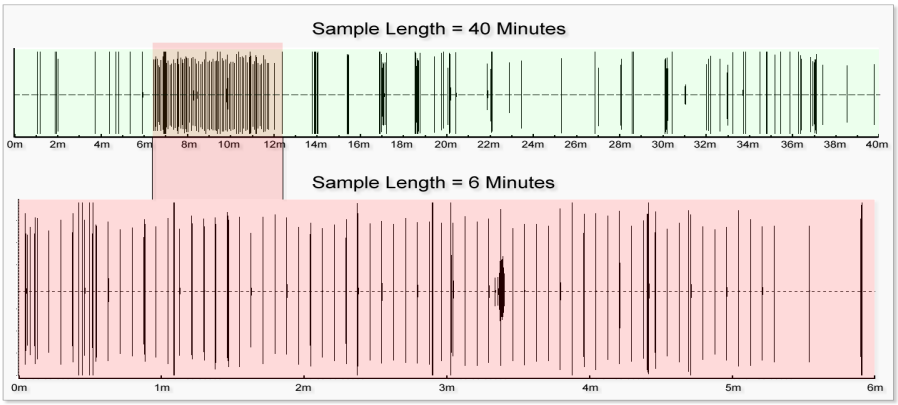
As for the reason for all these brief transmissions, a 2013 report by Richard Tell Associates, states the following:

> Smart meters emit short duration pulses of RF energy in their communication with other meters and data collection points. These emissions generally happen all through the day. Besides the normal three (in the case of BED) or four (in the case of GMP) times a day that electric energy consumption data are reported back to a data collection point for subsequent transmission to the company, smart meters must maintain their organization within the RF LAN to which they belong and this necessitates the transmission of beacon signals from time to time. Additionally, each meter can, when required by the mesh network, assist neighbouring smart meters by transmitting the neighbour's data on to another meter or data collection point. Further, the HAN radio can produce pulsed fields in its search for and communication with IHDs. All of this means that most smart meters remain relatively active in terms of brief signals being transmitted.[8]

As an illustration of this activity, **Table 2** shows measurements taken outside, one metre externally from a mesh network smart meter on a suburban house in Melbourne, Victoria.[9]

Table 2

SMART METER TRANSMISSION INTERVALS



[8] Richard Tell Associates, An Evaluation of Radio Frequency Fields Produced by Smart Meters Deployed in Vermont, http://publicservice.vermont.gov/sites/psd/files/Topics/Electric/Smart_Grid/Vermont%20DPS%20Smart%20Meter%20Measurement%20Report%20-%20Final.pdf

[9] Using a Gigahertz Solutions HF 35C RF meter, January 2013. They are only meant to illustrate the frequent transmission intervals of the smart meter measured.

Table 3

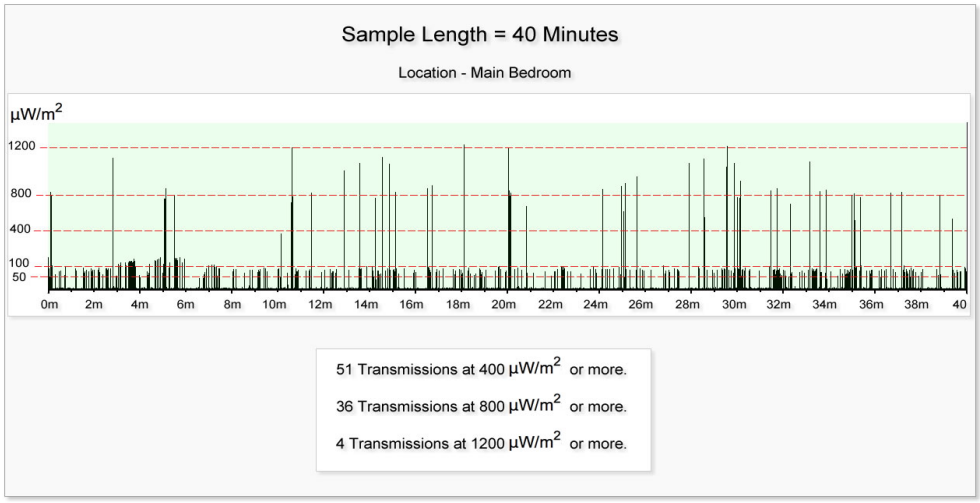


Table 3 shows the same house, this time with measurements taken by the bedhead in a bedroom adjacent to the smart meter. These levels are well below the Australian RF standard which is only meant to provide protection against high level RF of an intensity that can excessively heat human tissue.

Pages 8 – 10 of this paper lists a number of case histories, gathered from Victoria. Although these 10 cases are anecdotal, they are among over 400 collected by the community group, Stop Smart Meters Australia (https://stopsmartmeters.com.au/) and should raise a public health concern as they indicate that a possible health hazard may exist from the roll-out of smart meters in Victoria. Further to these cases, a 92-case study report by Melbourne medical practitioner Dr. Federica Lamech has been published in the Nov/Dec 2014 issue of the US clinical journal *Alternative Therapies in Health and Medicine*. The journal is a PubMed-listed, peer-reviewed publication.

The Lamech paper is titled "Self-Reporting of Symptom Development From Exposure to Radiofrequency Fields of Wireless Smart Meters in Victoria, Australia: A Case Series." The paper reveals that the most commonly reported symptoms from exposure to wireless smart meters were, in this order: insomnia, headaches, tinnitus, fatigue, cognitive disturbances, dysesthesias (abnormal sensation), and dizziness. The case series also revealed that the effects of these symptoms on people's lives were significant.[10] The report had already gained support from the American Academy of Environmental Medicine (AAEM) with the following public statement. "It is a well-documented 92-case series that is scientifically valid. It clearly demonstrates adverse health effects in the human population from smart meter emissions." [11]

The AAEM stated that it is critically important to note that the data in this case series indicates that the "vast majority of cases" were not electromagnetically hypersensitive

[10] F Lamech, 'Self-Reporting of Symptom Development From Exposure to Radiofrequency Fields of Wireless Smart Meters in Victoria, Australia: A Case Series', *Alternative Therapies in Health and Medicine*, Nov. 2014.
[11] AAEM, Nov. 14, 2013, https://www.aaemonline.org/pdf/torontoccltr.pdf

until after installation of smart meters. Dr. Lamech concluded that smart meters "may have unique characteristics that lower people's threshold for symptom development.[12]

Although the above cases are limited to Victoria, there are two other related surveys from the U.S. The first one was conducted for the EMF Safety Network in California by Dr. Ed Halteman and included 443 responses. The top health issues since smart meters installed were: sleep problems (mentioned by 49%); stress, anxiety and irritability (43%); headaches (40%); ringing in the ears (38%) and heart problems (26%).[13] The symptoms reported are consistent with those reported in the Victorian Lamech survey.
The second U.S. survey, which expanded upon the initial Halteman data, was conducted about a year later by Richard Conrad and Ed Friedman of Conrad BioLogic. A prime factor in this survey was to address the possibility of a psychosomatic response to the installation of a smart meter. They found that 42% of their over 200 respondents began developing symptoms before they knew a smart meter had been installed.[14] This is not to say smart meters were not responsible for new or increased symptoms in the other 58% but only that the first group was unaware of the meter installation and often unaware of the issue altogether. [15] This finding strongly indicates that in the first group the nocebo effect (psychological worry) was highly unlikely to be a factor in these cases.

Written evidence submitted to the UK Parliament in 2013 attested to the fact that the pulsed radiation from smart meters has resulted in thousands of health complaints world-wide. More than 10,000 health-related complaints were submitted to the California Public Utilities Commission alone, and included personal testimonies from medical doctors, psychotherapists and nurses regarding their own symptoms[16]

From a public health perspective, the above information clearly suggests that with the widespread rollout of smart meters, both mesh and 3G, we may have a significant and new public hazard that lies outside the parameters of the Australian RF standard referred to below.

Is distance from a smart meter important?

As prolonged close[17]proximity to a smart meter, especially at night, seems to be an important factor in symptom reporting it is worthwhile to consider a survey report from Isotrope Wireless conducted on a number of residences in New York State in November 2014. In measuring internal smart meter emission levels they found levels

[12] AAEM, Wireless Smart Meter Case Studies, http://skyvisionsolutions.files.wordpress.com/2013/11/aaem-wireless-smart-meter-case-studies.pdf
[13] E. Halteman, Wireless Utility Impacts Survey, Final Results Summary, Sept. 13, 2011, http://emfsafetynetwork.org/wp-content/uploads/2011/09/Wireless-Utility-Meter-Safety-Impacts-Survey-Results-Final.pdf
[14] Conrad Biologic, EXHIBIT D – Smart Meter Health Effects Survey and Report, http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2013/01/Exhibit-10-Smart-Meter-Health-Effects-Report-Survey2.pdf
[15] Correspondence with Ed. Friedman, 12 Jan. 2014
[16] , Written evidence provided to the Energy and Climate Change Committee, UK Parliament, Parliamentary business, Publications & records, http://www.publications.parliament.uk/pa/cm201314/cmselect/cmenergy/161/161vw107.htm
[17] Closeness still needs to be determined and may be dependent upon individual sensitivity.

diminished to background levels in more distant parts of the houses tested.[18] This raises the possibility that if smart meters are specifically installed well away from bedroom areas, and other areas where people spend large amounts of time in, this may go a long way in reducing the reported adverse health symptoms from smart meter exposure.

Irrelevance of the Australian RF standard.

It is acknowledged that even in a worst-case scenario smart meter emissions are far below the allowable standard limits for exposure. This was found in an AMI Meter Electromagnetic Field Survey conducted by EMC Technologies in Melbourne which found that exposure levels were well below the general public limit set by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). This may sound reassuring but what is not said is that the standard exposure limits are only designed to provide protection from acute exposure situations (short term exposure) where actual excessive internal body heating can cause significant biological damage.

The ARPANSA RF standard limits do not provide protection against lower-level chronic radiofrequency exposures such as from smart meters. Therefore, consideration of other possible biological effects unrelated to heating has not been taken into account in the actual setting of maximum exposure limits for radiofrequency exposures. Considering this, any assurance of smart meter safety based on these standards is disingenuous and more akin to an attempt to mislead the public.

How to opt out from Tasmania's roll-out of smart meters

Aurora has taken over the role of installation of smart meters from TasNetworks and now uses a "Metering Coordinator/Metering Provider" which is the Brisbane based company *Metering Dynamics*. They install, commission, gather, and verify data remotely from meters within the National Energy Market (NEM) market.

As stated previously the AEMC's final rule determination, which came into force on December 1, 2017 gives consumers with existing analogue meters the right to opt out from having their energy retailer install a smart meter on their premises. However, this must be communicated to the retailer (Aurora in Tasmania) beforehand. The rule also stipulates that the meter provider must give the small business or residential owner two notices in advance of a roll-out but it is best not to wait for a notice in the mail which may be missed, specially if one is away at the time – and you may not even get a notice.

Beware of the "catch-22" clause

It is important to note that if Aurora's metering supplier claims that their testing has indicated that your existing meter is likely to become faulty in the future, they do not have to give you any advance notice of a meter replacement. All you would get at best is a notice that your power will be temporarily interrupted for line maintenance.

[18] Isotrope Wireless, 'Report on Examination of Selected Sources of Electromagnetic Fields at selected residences in Hastings-on-Hudson', Nov. 23, 2013.

To opt out

- **For Aurora's customers who wish to opt out, the number to ring is 1300 13 2003**
- **The Aurora postal address (send by registered mail) for a written opt-out notification is: Aurora Energy Pty Ltd, GPO Box 191, Hobart, Tas. 7001**

After advising Aurora, it is important to also put up a "Do not Fit a Smart Meter" notice on your meter box. Date the notice, laminate it for the weather and take a photograph of it.[19]

For builders, architects and electricians.

Considering the push for wireless smart meters (advanced or digital meters) a precautionary action would be to design homes and offices with the electricity meter located well away from living and work areas.[20] For residences the main area of concern is bedrooms. Presently, it is a common practice to place the electricity meter with no consideration of what nearby rooms are used for. A further complication is the need to also consider other nearby residences. For example, in densely built up areas or apartment complexes, the locating of smart meters should take into consideration adjacent living and bedroom areas.

Case studies from Victoria

Case 1: "My symptoms started the night the smart meter was installed (externally on the bedroom wall). Waking with heart palpitations and a racing heart and internal shakiness. A surging feeling that went right through my body now and then. Head pain and a burning pain on the left side of the head. Depleted immune system, leading to flu and cold. I am now getting nausea and maybe 2 -3 hours sleep a night."

Case 2: "Since installation, I wake up with headaches every single morning and go to bed with something very much like vertigo every night. I have had this ever since the smart meter was installed. It is also installed on my front porch which is right outside my bedroom, so I am very close to it."

Case 3: "Since my smart meter was installed, I have experienced shortness of breath, palpitations, and headaches mainly at the back of my head. Could it be because the position of the meter is on the other side of the wall where I sit every night while watching TV? What can I do about it? I have no room to change the position of the couch and my symptoms are getting worse by the day."

Case 4: "It is very likely that your new smart meter or your neighbour's (if their meter is close by) is affecting you. I experienced the same issues as you described from my neighbour's two smart meters located three metres from my bedroom. After

---

[19] For further information see Stop Smart Meters Australia: actions you can take, https://stopsmartmeters.com.au/actions-you-can-take/

[20] Royal Australian Institute of Architects, BDP Environment Design Guide – Design for Minimal Radiation Exposure – Don Maisch, John Podd and Bruce Rapley – August 2006, Gen 76, https://www.emfacts.com/download/gen76.pdf

complaining to Powercor, I found that they must have reconfigured them as they are not communicating as much (confirmed with an EMF meter). My heart palpitations/pain in my chest has gone but I still am waking up with headaches (although they are not as intense as before the meter was reconfigured)."

Case 5: "I have developed ringing in my ears that would go away when I went to work. Now I have had two months off work, the ringing is constant. I have developed a thyroid problem since the smart meter was installed. I wake up aching. The meter is next to my bedroom wall."

Case 6: "Our smart meter was installed about two years ago. Our town in central Victoria was one of the earliest in the roll-out. Since its installation (outside my bedroom window), my health and the general health of my family has gone downhill rapidly…I suffer from severe headaches, memory loss, loss of motor skills. I feel as though I am walking around in a haze. I lie awake until daylight some nights, and others it is 1-2 pm when I wake up. There is also the high-pitched squeal that the smart meter emits constantly."

Case 7: "I came to Australia after a smart meter was fitted two metres below my bedroom window in NZ. I was not informed of the radiation danger. I subsequently experienced severe health problems and was at a loss to explain this. One of my students wrote a report about her own experiences with smart meters and I had to mark it. I began to put two and two together. The report probably saved me serious health problems."

Case 8: "A smart meter installed Aug 2012 unbeknown to homeowner. A high-pitched sound started that night, kept him awake. His inspection the next day found the new smart meter in his meter box. Ongoing insomnia, tinnitus and overall deterioration in health since then. Shielding has helped, but ongoing difficulty in sleep and tinnitus continues."

Case 9: "My son, aged 22, started work in a small graphic design studio in Fitzroy. After only being there a few weeks, he started to become quite unwell. He was getting severe dizziness, headaches, couldn't see straight or concentrate and was getting heart palpitations and extreme kidney pain, so much so that he had to take several days off to recover. On returning to work, the same thing happened again and by lunchtime he had to leave. As it was a Friday, he was able to have the weekend away and started to improve." The next week, his problems recurred yet again and it was then that he discovered that there was a smart meter situated inside a wooden box only about two metres from his head. Just to rule out any other cause, he underwent medical tests – ECG, blood test and kidney scan – which all came back clear. Finding that he was only getting worse at work, he felt he had no alternative but to resign. He is now 'sensitised' to EMR and gets quite dizzy when exposed to it."

Case 10: "I've been trying to find the answers to the question of the nightmare of noise mostly at night emitting through the walls of my home, it all started when a smart meter was installed on the outside wall of our home in Sebastopol Victoria …It has taken a tremendous toll on my health as the noise is ongoing. Many people I have spoken to have the same story to tell. We also have a neighbour's smart meter facing

our bedroom window. I can't say this is the answer, but it's strange to think it all started with the installation of the meter. I have such a problem sleeping now I am always exhausted. I've been unable to get a response from the installers they simply do not want to reply."