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June 14, 2012

Re: Comments and recommendations on the Draft report: Safety of Advanced Metering Infrastructure in Victoria, May 17, 2012¹

Dear Paul Fearon

Thank you for providing the opportunity to make comments on the draft report. The ongoing controversy over the introduction of smart grids, specifically the safety of wireless smart meters in relation to possible adverse health effects has been a topic of interest for me for some time now.

This interest stems from my involvement in telecommunications frequency standard setting since the early 1990s, initially as a science writer for Senator Robert Bell in Tasmania, then later as a public-interest committee member on the Standards Australia TE/7 Committee: Human Exposure to Electromagnetic Fields. As a result of my various writings on the topic, in 1993 I commenced a PhD candidature at the University of Wollongong, NSW with my chosen area of research being an examination of the history of telecommunications frequency standard setting. This encompassed the radiofrequency/microwave spectrum, hereafter referred to as electromagnetic radiation (EMR).

My specific emphasis was on the limitations of the standards and how institutionalized conflicts of interest in national and international standard setting bodies have affected the development of these standards. One of the fundamental problems with EMR research has been the almost complete control by vested interests, where organisations developing, marketing and using the technology are the ones who have been allowed to control the research efforts into possible health hazards from their products. This is exemplified in Australia where Telstra has been placed in effective control over the research into possible health impacts of its technologies.²

I note that even though the draft report states in its title that the emphasis is on the safety of the new meters, the issue of possible health effects receives scant mention – deferring the topic to the exposure standards set by the Australian Radiation and Nuclear Safety Agency (ARPANSA). The draft report simply concludes that “independent testing commissioned by the Victorian Government found that radio frequency electromagnetic exposures from single meters and groups of meters are well below the safe levels set by ARPANSA and are lower than other household devices such as mobile phones, microwaves and baby monitors.” What is not mentioned

¹<http://www.esv.vic.gov.au/Portals/0/Consumers/Files/Safety%20of%20advanced%20metering%20infrastructure%20in%20Victoria%20%20170512.pdf>

² D. Maisch, A Machiavellian Spin: Political and corporate involvement with cell phone research in Australia, Sept. 2010. http://www.emfacts.com/download/A_Machiavellian_Spin_Sept_2010.pdf

however is that these “safe levels” are only for protection against immediate thermal hazards (tissue heating) at high level exposures and not against possible prolonged or cumulative bio-effects from low intensity environmental exposures. As for possible health impacts of smart meter EMR emissions that are far below the standard limits, the ARPANSA standards are therefore irrelevant³ and it is disingenuous to give the impression that they are sufficiently protective of public health. As for the claim that smart meter emissions are less than other appliances in the home, such as a microwave oven for example, this does not tell us much because exposures are dependent on distance and duration of exposure. If one has a smart meter externally on a bedroom wall with their bedhead up against that wall, their nighttime exposures to the frequent emissions will most likely be the main source of EMR home exposures. One does not normally sleep next to an operating microwave oven! It would be interesting, however, to make a comparison between smart meter emissions and a DECT cordless phone when its base station is placed on a bedside table. This is because the base station handset cradle of most cordless DECT phones emits a pulsing microwave signal at full power 24/7 even when the phone is not being used. See: <http://www.emfacts.com/download/dect.pdf>

There is also the issue of duration of emission. The draft report gives the impression that smart meters are fairly ‘quiet’ and just record energy consumption every half hour. However, I have seen a number of cases in Victoria where smart meters were frequently sending out bursts of RF energy over 30 times per minute.⁴ The timing of these emissions seems to vary widely; for example, over the space of about every two minutes a newly installed meter I measured in Bendigo was sending out a number of RF transient emissions with the peak reading being slightly over 67mW/m²⁵. When not sending the level was .004mW/m². Over the time of recording, the transient emissions were on a brief but regular basis every 2 minutes. Note that these levels are only a rough indication and were taken externally, close to the smart meter. More accurate measurements need to be taken internally, especially when a bedhead is in close proximity to a smart meter. However, the important issue here is not the levels that are indicated, but that it is strong evidence that at least some smart meters are far more active than what the ESV report suggests. In this regard, the photo on the next page is of concern. It shows a transient reading of 727 mW/m² in the bedhead of a Melbourne home with the bedhead next to the wall where the new smart meter was placed. The couple now find that sleep is impossible there. It was a very quick transient spike that was captured quite by luck. If some people are having trouble sleeping close to a smart meter it may be these frequent transient EMR transmissions that are disturbing their sleep. A mechanism for how this is possible is presently unknown but could possibly involve an effect on brain receptors/neurotransmitters, and even an effect on the pineal gland that mediates the circadian rhythm (sleep/awake cycle). Considering the large numbers of people who may be sleeping in close proximity to smart meter emissions these are important research questions that should not be dismissed simply because the exact mechanism is not known.

³ This is examined in detail in: D Maisch, Chapter 5, A case study on ICNIRP Harmonization and the Australian RF exposure standard, *The Procrustean Approach*, pp. 193-224. <http://www.emfacts.com/the-procrustean-approach/>

⁴ For example see: <http://www.youtube.com/watch?v=hTLCgwDQliY&feature=youtu.be>

⁵ milliWatts per meter squared (mW/m²)

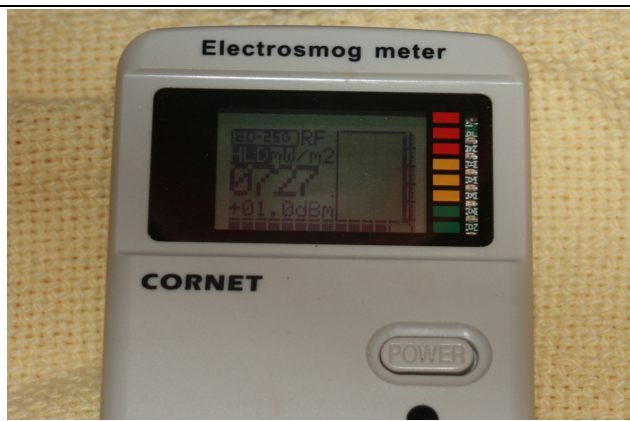


Photo taken on the bedhead in a home in Melbourne with a smart meter immediately outside on the external wall.

Although there are currently a number of contentious technical issues connected with the introduction of smart metering technology, I will focus my comments on the issue of adverse health complaints from residents after a smart meter has been installed on their home, especially when the meter is on an exterior bedroom wall with a bedhead placed in close proximity to the meter, as mentioned above. Many of the reports I have been getting from the Melbourne area are from people who have recently had their old analogue meter replaced with a smart meter and subsequently developed sleep disorders, headaches, tinnitus, fatigue and a number of other complaints when the new meter is close to their bedhead. Here are two examples of this type of complaint:

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.⁶

My symptoms started the night the smart meter was installed. 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.⁷ (This is in reference to the above photo)

What are we to make of similar anecdotal reports, not just from Victoria but from other nations as well? Are they the result of a real biological effect from close proximity EMR exposure or, as has been suggested by some, a type of public hysteria caused by exposure to newspaper articles, TV investigative programs, web sites and YouTube videos? As this is now being claimed to be the situation (below) by those promoting smart meter technology, this claim needs to be examined in some detail.

⁶ <http://stopsmartmeters.com.au/2012/06/04/i-wake-up-with-headaches-every-single-morning/>

⁷ Personal email communication, April 12, 2012.

Panic or real?

What was a simple idea [smart meters] is slowly turning into a nightmare scenario that is consuming people's lives, fear is taking hold and the propaganda engine is giving rise to a new nation, one where mis-information and out of context research, articles and video are being used to further create hysteria⁸

Angus Doyle CEO Detect Energy

In a January 2012 Montreal newspaper article on the roll-out of smart meters by Hydro-Quebec, the author put down the mounting public opposition to their introduction as a consequence of an “unjustified panic” that was being “carefully cultivated” by environmentalists.⁹ The obvious implication from this viewpoint is that if health effects become widely reported by members of the public after smart meters have been installed on their homes, it is only because they have heard about health hazards from the media and anti-smart meter activist groups and as a result have worried themselves sick. This is known as the nocebo effect. This line of reasoning has been suggested by Professor Andrew Wood from the Brain and Psychological Sciences Research Centre at Swinburne University of Technology. In his report on smart meters, he suggests that the nocebo effect may play a role in symptoms being reported.¹⁰ Wood expressed a similar opinion at the Annual 2003 conference of the Australian Radiation Protection Society (ARPS) where he gave a presentation that compared the public's concerns over health hazards from EMR to a newspaper article about Russian museum workers fears over a curse supposedly placed on a Russian sacred icon on display – with an obvious inference that the public's concerns over EMF were just as irrational.¹¹

There are two reasons for a dismissive attitude to the possibility of adverse health effects from smart meters, both that do not stand up to an objective analysis. The first is a reliance on the advice of official standard setting bodies and the second is a reliance on the findings of provocation studies on people who have identified themselves as being sensitive to EMR. This condition is called electromagnetic hypersensitivity (EHS).

What the standard setters say

The prime reason why possible adverse health effects are dismissed when it comes to smart meters and other wireless devices is an unquestioning acceptance of the advice of the standard setting bodies, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the industry body, the International Committee on Electromagnetic Safety (ICES)¹². This advice states that the only established adverse effect of RF/MW exposure (other than shock from direct contact with a transmitting surface) is heating from acute exposures and that other reported effects not related to heating (non-thermal effects) have not been established and therefore cannot be taken

⁸ A Doyle, ‘Sex, Lies and Smart Meters – The Truth Is Out There’, <http://detectenergy.com/smart-meter-power-monitor/smart-meter-5/>

⁹ F. Cardinal, ‘Double discours’, *The Montreal Daily La Presse*, Jan. 27, 2012,

<http://www.cyberpresse.ca/debats/editorialistes/francois-cardinal/201201/26/01-4489772-double-discours.php>

¹⁰ A Wood, Comparison of the Preliminary Victorian Study To Other Overseas Studies, in *AMI Meter Electromagnetic Field Survey. Final Report*. Prepared for the Department of Primary Industries, Appendix A, pp. 87-94,

¹¹ A. Wood, ‘Effective Protection against Non-Ionizing Radiation (NIR) or: the Devil's in the Detail’, ARPS-28 Conference, Hobart Function and Conference Centre, Oct.28, 2003.

¹² The International Committee on Electromagnetic Safety (ICES) is the group within the Institute of Electrical and Electronic Engineers (IEEE) charged with setting RF/MW exposure limits.

into consideration in setting exposure limits.¹³ ICES takes a hardline view on any possible hazards from non-thermal exposures (such as from smart meters) as expressed by ICES member Ralf Bodemann in 2005:

Electrosensitive persons do not exist...These persons suffer not due to their exposure to EMFs [electromagnetic fields], but because they develop a psychosomatic syndrome...the complaining people may be hypersensitive indeed, but not to electromagnetic fields. They are hypersensitive to rumours, alarming messages, false reports, false alarm and fictitious news. They do not trust the scientific results and develop psychosomatic syndrome, often quite serious. Their troubles should be treated by a psychologist or by a psychiatrist, not by lowering the EMF limits or by removing the alleged sources of EMFs.¹⁴

However, as I have examined in detail in my thesis *The Procrustean Approach*, the thermal-effects-only paradigm that both ICNIRP (which the Australian standard follows) and ICES have maintained since their inception, has been with the direct involvement of vested interests in setting RF/MW exposure limits. This involvement has ensured that exposure limits would not restrict technological development. This has therefore marginalised scientific perspectives that contradict that paradigm – a historic problem that has haunted the advancement of science ever since the time of Galileo. As for those marginalised scientific perspectives – evidence for adverse health effects not related to heating (or induced body electrical currents from extremely low frequency (ELF) powerfrequency exposures) - there is a substantial body of research that shows that the existing standards are inadequate for public health protection. They are inadequate because they exclude scientific evidence that prolonged exposures to low-intensity EMR can have adverse biological outcomes at levels far below the official standard “safe” limits.

Two recent publications that document this research in great detail are the *Bioinitiative Report*¹⁵ and *Non-Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter*.¹⁶ (Appendix A) As well, the inadequacy of the current exposure standards were highlighted at an international EMF conference in Norway in 2011.¹⁷

Provocation studies

The second reason for dismissing possible smart meter health effects from EMR exposure has been reliance on the findings of provocation studies to evaluate the reality of electromagnetic hypersensitivity (EHS). This type of study simply consists of exposing subjects who have identified themselves as electrosensitive to EMR to see if they can feel when the field is turned on or off. These tests have generally found that the subjects failed to distinguish whether the field was present or not - leading to a conclusion by the researchers that the fields were not the cause of their reported symptoms and therefore the problem may be psychosomatic.

¹³ This is outlined in the 12 “guiding principles” used by the International Committee on Electromagnetic Safety (ICES) for RF/MW standard setting. See D. Maisch. Op cit, pp. 150-151.

¹⁴ R. Bodemann, Report on WHO IAC meeting June 13-14, 2005. IEEE ICES TC95 Meeting, Approved Minutes, Dublin, Ireland, June 26, 2005.

¹⁵ C. Blackman et al, The Bioinitiative report, A Rationale for a Biologically-Based Public Exposure Standard for Electromagnetic Fields (ELF and RF). May 18, 2010, <http://www.bioinitiative.org/freeaccess/index.htm>

¹⁶ L. Guiliani, M. Soffritti (eds.), Non-Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter, *European Journal of Oncology*, Vol. 5, Bologna, Italy, 2010.

<http://electromagnetichealth.org/electromagnetic-health-blog/ices/>

¹⁷ <http://iemfa.org/index.php/publications/seletun-resolution>

Central to EMR provocation studies is the hypothesis that if a person is sensitive to EMR they should be able to feel when the exposure is taking place. If not, it must be a psychological problem. For example, Rubin and colleagues from Kings College, London reviewed over 40 provocation studies on EHS volunteers and concluded that, overall, people with EHS did not react to EMR exposure any differently from the way subjects react to a sham exposure. Thus, the authors suggested that EMR was not the cause of their condition.¹⁸

A significant weakness of provocation studies when applied to possible adverse health effects of EMR exposure, however, is the assumption that if there are adverse biological effects from exposure, affected people should be able to feel when they are being exposed. Such an assumption would quickly be rejected if it were applied to ionizing radiation. Obviously people are unable to feel when they are exposed to x-rays or other sources of ionizing radiation.

It is my opinion that provocation studies are the wrong approach for this reason. By limiting research to people who have identified themselves as suffering from EHS, a far larger group of people may be overlooked. These are people who may be adversely affected by EMR exposure but have not identified EMR as a factor in their illness, and are unable to sense when they are being exposed. This is not to invalidate the claim that some people can indeed feel when they are exposed to EMR but that topic is outside the scope of this submission.

Considering the nocebo effect

As for the claim that the nocebo effect may play a role in some smart meter health complaints, I would be surprised if this were not the case given the following points:

- Victorian homeowners have been given no say in the matter and are threatened with disconnection if they refuse to allow a smart meter to be placed on their home. This forced placement of smart meters on one's own home, coinciding with the IARC classification of EMR as a Group 2B possible carcinogen is enough to generate public outrage. For comparison, imagine the public outrage if the Victorian government mandated that every Victorian home must be sprayed regularly with DDT (another 2B classification) to control mosquitoes.
- According to risk expert Peter Sandman it is outrage that causes hazard perception¹⁹ – suggesting here that the compulsory installation of smart meters is causing a degree of public outrage which thereby generates increased perception of a possible hazard. With this viewpoint it can be argued that if there is a nocebo effect from smart meters, it is not because of media scare stories or activists' web sites but primarily from the very act of making smart meters compulsory.
- There is ample peer-reviewed and published scientific literature now freely available on the Internet that indicates that the existing RF standard assurances of safety are inadequate for public health protection. Thus, community health concerns do have a scientific basis and should be addressed with open and

¹⁸ Rubin, GJ, Electrosensitivity: A Case for Caution with Precaution,

http://archive.radiationresearch.org/conference/downloads/011555_rubin_extra.pdf

¹⁹ P Sandman, 'Outrage Causes Hazard Perception: Peter Sandman on Risk Communication', <http://www.youtube.com/watch?v=QhPWYlq7qg>

honest communication, something which, in my opinion, has not yet taken place with the smart meter rollout in Victoria. Simply trying to dismiss the whole safety issue as the result of “criminal damage”, and claiming that media coverage is causing concern and worry, only serves to insult the intelligence of a large number of concerned Victorians. This increases the level of public outrage/hazard perception.

Consider the advice of a report by the U.S. National Academy of Sciences, National Research Council (NAS/NRC) in 2008. They concluded that public involvement in environmental decision-making is more likely to improve than undermine the quality of decisions made. The report found that even though scientists may be in the best position to make technological based decisions, public values and concerns are important to frame the scientific questions asked and ensure that decisions address all of the issues relevant to those affected. The report went on to say that when there were cases of public involvement making matters worse, it is usually when participatory processes were set up to divert the public’s energy away from criticism and into activities that were considered safe by an agency. The report concludes, in part, that the improper use of public participation to avoid conflicts on important issues is counterproductive in the long run.²⁰

The nocebo effect is but a distraction

It is important to note that the nocebo effect, and its opposite the placebo effect, are part of the human condition and can play a role in a wide range of human health concerns - including the current controversy over smart meters. In health research it has long been recognised that studies must be designed to rule out their influence as much as possible. However, if we are to believe the views of Bodeman from ICES, mentioned earlier, when it comes to symptoms reported to be from EMR exposure (other than heating) it must be because of worry and nothing else. Bodeman called it a psychosomatic syndrome - the nocebo effect. Central to this claim is the understanding that without a conscious pre-existing worry there would be no symptoms at all – it’s all in the mind.

In my work I have met a number of people who claimed that they were electrosensitive but other psychological factors were also in play. In some cases it seemed that a slight sensitivity had led to an over attention to the problem and a subsequent worsening of symptoms –possibly due to worry indicating that a nocebo effect was possibly involved. However, this has occurred in a minority of cases. For this reason, in a CFS/EMF exposure study that examined residential exposures to mains power magnetic fields in a group of chronic fatigue patients²¹, a decision was made at the onset not to include subjects who had any pre-conceptions that their illness may be caused by electromagnetic field exposure. In other words, none of the participants were worried about EMF thus ruling out a nocebo effect as far as possible. What we found is that reducing ‘excessive’ nighttime ELF magnetic fields significantly improved fatigue symptoms and quality of sleep.²² Interestingly, one of the symptoms reported, tinnitus,

²⁰ T. Dietz, P. Stern, (eds.), Panel on Public Participation in Environmental Assessment and Decision Making, National Research Council, *Public Participation in Environmental Assessment and Decision-making*, National Academies Press, Aug. 22, 2008. <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=12434>

²¹ D. Maisch, J. Podd, B. Rapley, Changes in Health Status in a Group of CFS and CF Patients Following Removal of Excessive 50 Hz Magnetic Field Exposure, *JACNEM*, Vol. 21, No. 1; April 2002, http://www.emfacts.com/download/cfs_changes.pdf

²² J. Podd, D. Maisch, Reducing the level of 50 Hz Magnetic Fields Lessens Symptoms of Chronic Fatigue and Improves Sleep, 2nd International Workshop on "Biological effects of Electromagnetic fields", 7-11 October 2002, Rhodes, Greece, <http://www.emfacts.com/download/Reducing50.pdf>

especially at night, disappeared after removal of the source of exposure.

The Ross House workers compensation case

The absence of any nocebo effect was also seen in a Workcare Compensation case that took place in Melbourne Victoria in 1991-1992. In this case a number of women who had worked in an office directly over an electrical substation all had remarkably similar symptoms that ceased when they no longer worked in the area. None of the women had any idea that there were high power-frequency magnetic fields in the office. Common symptoms were the following:

chronic tiredness/fatigue; insomnia; stress; listlessness; lightheadiness; prone to virus infections; reduced ability to cope; an inability to concentrate; depression; facial rashes; severe premenstrual tension; fluctuating hormone levels; headaches. One woman summed it up as "a permanent severe case of jet lag".²³

Review of the Russian literature

In a review of about 1500 original papers from the Russian medical literature from 1960 to 1996, Drs. Karl Hecht and Hans-Ullrick Balzer found a number of symptoms reported by company physicians involving several thousand industrial workers from both high voltage power plants and radar installations (microwave). Among these symptoms were sleep disorders, exhaustion, weariness, lack of concentration, headaches, and dizziness.²⁴ In private correspondence with Balzer, he mentioned that the condition of Neurovegetative Asthenia was often mentioned in the Russian literature (referring to RF/MW and ELF) and it was essentially the Russian term for CFS.²⁵ The symptoms reported in the Hecht and Balzer review are similar to the 1995 Swiss findings of the health impact of a short-wave transmitter situated at Schwarzenburg, Switzerland.

The Swiss transmitter study

A short wave transmitter was erected at Schwarzenburg, near Berne, Switzerland, in 1939 with a number of other antennas added in 1954 and 1971. Since the 1970s, a number of health complaints were reported by the population in the vicinity of the transmitting facility. In March 1990, a petition seeking a scientific evaluation of the health damage allegedly cause by the RF transmissions was handed by a group of Schwarzenburg residents to the Swiss Federal Department of Traffic and Energy (SFDTE). In October 1990, the Head of SFDTE commissioned a study which was carried out by a number of doctors and scientists, primarily from the University of Berne, but also from 4 other agencies. Their findings were published in August 1995.²⁶

²³ The Ross House Electrical Substation Workcare compensation case, Melbourne, Victoria, 1991-1992. A report on the investigation of a worker's compensation claim for "chronic tiredness arising from excessive exposure to high levels of electromagnetic radiation due to a substation located at place of work", EMFacts Consultancy, Feb. 1999. http://www.emfacts.com/download/The_Ross_House_Electrical_Substation.pdf

²⁴ Hecht K, Balzer HU, Biological Effects of Electromagnetic Fields on Humans in the Frequency Range 0 to 3 GHz: research and development. Summary and results of Russian medical literature from 1960 – 1996. Institut für Stressforschung (Institute for Stress Research) Research & Development, Berlin, 1997.

²⁵ Correspondence with Hans-Ullrick Balzer in relation to the Russian medical literature on EMF exposure and immune system dysfunction, characterised by the conditions Chronic Fatigue Syndrome (CFS) and Electromagnetic Hypersensitivity (EHS), July 1999.

²⁶ ES Altpeter et al, Study on Health Effects of the Shortwave Transmitter Station of Schwarzenburg, Berne, Switzerland, The Federal Office of Energy, *BEW Publication Series* Study No. 55, Aug. 1995.

The researchers carried out an extensive evaluation of health effects, using a carefully crafted health diary survey. They found significant changes in a number of health conditions which increased with proximity to the mast and were significantly worse in elderly people. They included the following:

nervosity (restlessness); disturbances in falling asleep and maintaining sleep; joint pain; disturbances in concentration; general weakness and tiredness.

Sleep disturbance was associated with a maximum exposure of 1.85uW/cm² with a mean nocturnal exposure of less than 0.7 uW/cm². People living in a mean RF exposure of 3.8 uW/cm², which was about 100 times higher than for an unexposed group, had a significantly elevated level of restlessness, sleep disruption, aches and pains and phlegm problems, all problems which were significantly worse for those aged over 45 years. In an analysis of the study by Neil Cherry, it was noted that a number of variables in the study, namely "Nervosity and inner restlessness", "General weakness and tiredness" and "Difficulties in falling asleep" were strongly related and could be termed "chronic fatigue syndrome". **Cherry also noted that Hypochondria (the authors called it a "health-worrying personality") [Nocebo] was tested for but not found. This was highlighted when the transmitter was turned off unexpectedly, and unknown to the residents, in the middle of the study. Affected sleep patterns recovered until the transmitter was turned on again, when they deteriorated again.**²⁷

The authors of the Schwarzenburg Study concluded:

Our results indicate a higher frequency of disorders of a neurovegetative nature among residents up to about 1000 m from the transmitter, and are highly suggestive of a direct effect of the radio shortwave transmitter on sleep quality.²⁸

It is important to note here that the exposure levels in this study were far below what ICNIRP and ICES have deemed as supposedly safe exposure limits, and appear to be in the range one might experience when sleeping close to a working smart meter. This needs to be verified by independent testing in actual homes, not in an artificial laboratory setting. Going by the above study, levels of interest would be in the 7mW/m² (0.7 uW/cm²) to 38mW/cm² (3.8uW/cm²) + range.

A rough draft for a research proposal to clarify the issue

Considering the huge financial investment in the rollout of smart grid technology, the apparently mounting anecdotal reports in many countries that smart meter emissions may be making people sick may turn out to be a significant impediment to the implementation of the technology. There is an urgent need for independent research to settle the issue. Are these concerns justified or is it all just a consequence of needless worry?

One way to proceed with this research is to take the 'worst case scenario' – when a bedhead is next to a smart meter on the outside of the wall and design a study to determine if smart meter emissions do, or do not, affect sleep patterns. This should be done as a double blind study, through an independent²⁹ sleep centre. Set up a sleeping

²⁷ N. Cherry, Swiss shortwave transmitter study sounds warning, *Electromagnetics Forum*, Vol. 1, No. 2, Article 10, http://www.emfacts.com/forum/issue2/mag_9.html

²⁸ *ibid.*

²⁹ This would require that the testing facility and investigators have no present or former financial or employment ties with an industry sector that might be affected by the findings of the study. The importance of this is highlighted

room with a smart meter close to the bedhead on the other side of the wall so it is not seen by the participants. As it might be difficult to set up an operating smart meter in a laboratory situation, it may be easier to use an existing residence with a bed placed by an existing smart meter that has been modified to be able to be switched on and off at random times. Smart meter emissions would be confidentially recorded throughout the study.

Ask for healthy volunteers (equal numbers of males and females) to spend a few nights sleeping in the room, while collecting EEG (electroencephalogram) data to gauge sleep and brain wave patterns, etc. The meter would be switched on and off for some of the volunteers but neither the volunteers nor the people overseeing the experiment will know whether or not the smart meter is active or not. A questionnaire would also be used to assess subjective feelings, such as depression, stress, anxiety levels, and tinnitus, for example.

A second part of the study would be to also call for volunteers who claim to be adversely affected by smart meter emissions to see if their symptoms correlate with the times the meter is emitting. A provocation study could be included here to see if these subjects could sense whether or not the meter was active while awake. Most important, an unblinded and independent oversight committee would be created and would include members from concerned trade unions, public interest groups and the medical fraternity. This would be to ensure that the eventual findings have been obtained without vested interest influence.

If at the end of the first part of the study, the volunteers show no differences in sleep patterns, even when sleeping next to an active smart meter, that would go a long way internationally to assure the public that smart meters are safe.

If, on the other hand, clear differences in sleep patterns are seen, that would call for a reevaluation of the present type of wireless smart meter being used and positioning in relation to bedroom areas.

I hereby highly recommend that such a study be designed, funding provided, and implemented as a matter of urgency. Along with this recommendation there should be a halt to the further roll out of smart meters in Victoria until the findings of this research are known.

I hope that the above concerns are taken into consideration in the final version of the Energy Safe Victoria report: Safety of Advanced Metering Infrastructure in Victoria.

Sincerely,

Don Maisch PhD

by the International Committee of Medical Journal Editors in their “uniform requirements” statement. To quote in part: *Financial relationships . . . are the most easily identifiable conflicts of interest and the most likely to undermine the credibility of the journal, the authors, and of science itself.*” http://www.icmje.org/ethical_4conflicts.html