Reference: ERC0378 AEMC Draft Rule Accelerating SMART meter deployment
Project Leader: Julia Cassuben

Submission from Dr Rosemary Faire, 2090, NSW

My Background:

I am a former research biologist and university educator with a history of sensitivity to electromagnetic radiation. For many years people with EMF sensitivity were gaslit but now the research has caught up with the harms caused by exposure to electromagnetic radiation including radio frequencies. My electric meter is on my bedroom wall and were it to be replaced by an RF-emitting meter I would no longer be able to inhabit my house. I have replaced all other Wireless devices in my home, using ethernet cables and landline phone, so in a very practical sense my life would be detrimentally affected by a Type 4 SMART meter installation.

My Concerns

I oppose the AEMC draft rule (the new Accelerating Smart Meter Deployment rule) that aims to achieve '**universal uptake** of SMART meters in the NEM [National Energy Market] by 2030', which is a major departure from the 2017 'Expanding competition in metering and related services' electricity rule. Below I outline my concerns, which begin with the submission writing process itself: (**Assessment Criteria** (Fig.2.1): https://www.aemc.gov.au/sites/default/files/2023-09/Publication2%20-%20Guide%20to%20AEMC%20decision%20making%20-%20Sep%202023.pdf)

Firstly, your requirements for submissions are written in bureaucratic jargon which unfortunately presents an almost insurmountable barrier to any member of the general public ("stakeholders") being able to make a submission that jumps through all the hoops you require. Does that mean such submissions can be disregarded because they don't fit into your prescribed format? That can hardly be called a consultation process. One is tempted to give up before even starting to write such a meet-our-criteria-or-we-can-ignore-you submission, but maybe I should give you the benefit of a doubt that you really value consumer opinions, concerns and feedback? I certainly hope so.

I also find your "assessment framework" to be highly problematic, because, although you use words in your National Electricity Objectives (a) and assessment framework which mean something in common usage, you then go on to provide very limited "definitions" of these words which obscure rather than aid public understanding. For that reason I will use these terms with their common meanings, followed by my concerns relating to these words:

- "**…providing choice**":

I support customers' **rights to choose** non-EMF-emitting meters for **health and safety** reasons. I am therefore supportive of the retention of the right for customers to elect to have a non-communicating (Type 4A) smart meter (assuming that Type 4A are not a source of RF and dirty electricity/pulsed RF*), and that this right cannot be revoked and replaced with **mandatory** / **"universal uptake"** of SMART meter installation.
https://www.aemc.gov.au/news-centre/media-releases/final-rule-enable-metering-coordinators-deactivate-smart-meter

*The difference between Type 4A and Type 5 MRIM meters is very hard to find out. Obviously if there are differences in RF emissions between these, customers have the right to know and the information should be readily available. The bottom line is that I personally do not consent to having a radiating/transmitting meter installed on my property - can I be forced to accept an RF

emitting smart meter and have my data shared with third parties if I do not give my consent? If so, "choice" is a joke. If I am allowed a non RF-emitting meter but am financially penalised for choosing the safer option, that is a form of **discrimination** against lower income customers.

Your 2023 *Review of the regulatory framework for metering services*, states that currently less than 0.01% of customers had opted for Type 4A meters. I am of the opinion that this is because **most people are unaware of the effects of EMF/RF on their health** and **therefore are not capable of giving informed consent**. They are therefore not really choosing such devices. Informed consent would involve not only the known research on biological effects of RF radiation (including being classified as a class 2B carcinogen), but also the details concerning privacy of data emitted by transmitters and the measures taken against hacking of this data, and the details of "data sharing" by providers - who is going to have access to this private information and why?

According to the new draft rule, **only four days' notice** would need to be given to customers prior to a SMART meter installation. This is **totally unacceptable** and smacks of an authoritarian one-size-fits-all regime which denies customers the time to research, consult experts, consider the evidence and follow up their right of refusal.

- "clear information"

I notice you are no longer capitalising SMART, which stands for Self-Monitoring Analysis and Reporting Technology. The acronym SMART is being used widely to make people think this is clever. How clever is a technology that emits radiation directly outside one's bedroom wall, 24 hours a day, and creates a pulsating antennae out of one's household electrical wiring? There is no "clear information" anywhere on your website about the known health effects of smart meters. Why? Is this discussion inconvenient for a steamrolled "universal" deployment intent? Is leaving out such information justified by some sort of cost-benefit "modelling" which is not disclosed? If collateral damage is being ignored "for-the-greater-good" then we have a serious problem in our "democratic" society.

- "consumer protections"

Is the government going to **indemnify** electric companies who instal these meters for liability for future adverse health consequences arising from the meters? Is this going to be a repetition of the Safe&Effectives Debacle? Or are those responsible under the illusion that adverse health effects will be unprovable in the courts?

- "safety" (3.1.6),

In your **(3) Customer Safeguards**, there is no mention of safeguarding customers' **health**, only their wallet! The talk about "social licence" is absurd: how can you feign "social licence" when customers have no possibility of informed consent? Are you presenting them with the evidence of the harms of RF/EMF on their bodies? There is extensive literature on this - please refer to the attached:

(i) Statement from Doctors,
(ii) Statement from Scientists and
(iii) All of the links provided below under Scientific and Medical research evidence

SMART meters' adverse affects health (for details please refer to the attached statements and the scientific/medical research section below):

- **RF emitted** by wireless transfer of data
- **Pulsed RF** over house electrical wiring
- "**antenna effect**";
- **Avoidance is impossible** once installed, no amount of "shielding" can prevent antenna effect";

RF radiation has been classified as a Class 2B carcinogen by the IARC. Some people are more vulnerable to RF radiation than others, including foetuses, babies, the sick, people with cancer, the immune compromised and the elderly. Who is going to compensate customers for adverse

effects? The energy suppliers? The government? How 'smart' is rolling out a new technology "universally" and then letting tax-payers pay for the collateral damage?

Falling back on the Regulators' evaluations of "Safety" levels of RF carries with it the **assumption that our regulators have no conflict of interest,** which these days can hardly be taken for granted.

The "safe" levels of RF were assessed on the **heating effects**, which are only the tip of the iceberg of harmful effects of EMF on the human body (https://ieeexplore.ieee.org/abstract/document/10121536). The Australian RF standard does not protect consumers from the **continuous, low-level, long-term biological radiation effects of SMART meters**, but rather only covers instantaneous acute heating effects, and so is completely irrelevant to this discussion. Many meters are actually installed on the outside of bedroom walls, like my own. So how can anyone justify exposing customers to close proximity RF transmissions all through the night, every night for the rest of their lives?

- "**security**" (3.1.8) and **"reliability"** (3.1.7)"

How secure and reliable is an electricity supply which is monitored constantly and capable of being cut off if customers' usage is considered inappropriate by governments? Once this infrastructure is in place, can you guarantee it won't be misused to deprive citizens of power to their homes if they do not comply with government directives? And how secure is private information about one's energy usage (providing data on such things as when residents are home and when they are not home) when it is being beamed out by a transmitter?

It is interesting to note the definition of "smart meter" given by AER: https://www.aer.gov.au/system/files/Essential%20Energy%20%20Attachment%208.4_Types%205%20and%206%20Metering%20Services%20Proposal%20-%202014.pdf

"The National Electricity Law defines smart metering infrastructure as "infrastructure (and associated systems) associated with the installation and operation of remotely read electricity metering and communications, including interval meters designed to transmit data to, and ***receive data from****, a remote locality."*

Does that include the ability to remotely switch units off? If so, this is hardly "security" of supply.

- …**"prescriptive rules" vs "flexibility…principles-based rules**"

It sounds to me like "universal uptake by 2030" is highly prescriptive, smacks of an agenda which is to be rolled out regardless of whether citizens object or not. I certainly advocate flexibility, but that means **flexibility to reconsider the scientific and medical evidence for harms of this technology** rather than hiding behind a regulatory framework which is out of date and deeply conflicted by industry-captured regulators.

The future impact on consumers? Just like the asbestos, cigarette and current Safe&Effectives, the consequences of a "universal uptake" of SMART meters for the future health of consumers will not be apparent to the general public for some time (except for those like myself who will feel the effects immediately), while those behind the rollout and its "benefits" to industry will no doubt try to vilify concerned doctors and scientists as "conspiracy theorists", "tin foil…" etc for as long as possible, as always.

Scientific and medical research evidence

If the reader of my submission is in denial of the biological effects of RF on the human body, I suggest some self-education:

Statement regarding Harmful Biological effects of communication radio frequencies (RF-EMR)
https://www.orsaa.org/uploads/6/7/7/9/67791943/attachment1-eu-orsaa.pdf

Research summaries (Henry Lai, 2012 updated 2022):
https://bioinitiative.org/research-summaries/

Aachen University research portal on EMF effects
https://www.emf-portal.org/en

RF report on assessment of the effects of RF emissions from SMART meters (SAGE, 2011) California
http://sagereports.com/smart-meter-rf/?page_id=212

Biological and health effects of microwave RF transmissions, 2013 report (review of 279 biomedical research publications)
https://www.national-toxic-encephalopathy-foundation.org/wp-content/uploads/2012/01/Biological_and_Health_Effects_of_Microwave_Radio_Frequency_Transmissions.pdf

International Appeal: Scientists call for protection from non-ionising electromagnetic field exposure
https://emfscientist.org/index.php/emf-scientist-appeal

Some thoughts on the possible health effects of electric and magnetic fields and exposure guidelines
https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.994758/full

Flydal & Nordhagen report (2023 Eng) on SMART meters, dirty electricity, pulses and health:
https://einarflydal.com/sdm_downloads/download-smartmeters-dirty-electricity-pulses-and-health-pdf/

Victorian study on symptoms reported after exposure to smart meters:
https://www.ncbi.nlm.nih.gov/pubmed/25478801

Thank you for reading my submission. Please consider that most people don't even know about this submission process and wouldn't have time to devote to it. Many customers/consumers of this proposed "universal" rollout would even scoff at the suggestion they write a submission about their concerns, because they would be cynical that it would make any difference, and would believe the "community/stakeholder consultation" process to be a tick-box exercise for a forgone concluded outcome. I hope they are wrong.
Dr Rosemary Faire
[redacted]

PHYSICIANS STATEMENT

IN THE SUPREME COURT OF PENNSYLVANIA
MIDDLE DISTRICT

RE: No. 34 MAP 2021, *Povacz, M, et al. v. PUC*
Associated Case(s):
35 MAP 2021 Consolidated
36 MAP 2021 Consolidated
37 MAP 2021 Consolidated
38 MAP 2021 Consolidated
39 MAP 2021 Consolidated
40 MAP 2021 Consolidated
41 MAP 2021 Consolidated
42 MAP 2021 Consolidated
43 MAP 2021 Consolidated
44 MAP 2021 Consolidated
45 MAP 2021 Consolidated

PHYSICIANS STATEMENT

SMART METER EFFECTS ON PATIENTS WHO ARE ADVERSELY AFFECTED BY EXPOSURE TO RADIOFREQUENCY AND ELECTROMAGNETIC EMISSIONS

Purpose of Statement

1. The undersigned are physicians - medical doctors (MDs) and Doctor of Osteopathic Medicine (DOs). Our duty as physicians is to help our patients and protect our community's public health. The American Medical Association's Code of Medical Ethics also demands that we seek legal outcomes that are in the best interests of the patient. Code of Medical Ethics Opinion 8.1 states that "While a physician's role tends to focus on diagnosing and treating illness once it occurs, physicians also have a professional commitment to prevent disease and promote

health and well-being for their patients and the community." Our Hippocratic Oath requires that we take all necessary steps to "prevent disease whenever we can." Our professional ethics therefore demand that we participate in efforts to prevent patient harm.

2. We file this statement to share with the Court our knowledge of the scientific and medical literature and our experience working with those of our patients, adults and children, who are adversely affected by exposure to wireless-based technologies, including smart meters. Combined we have over 3,000 patients who suffer from electro-sensitivity and/or other conditions which are aggravated by exposure. We hope our statement will help the Court reach an informed and equitable decision in this extremely important case that may have widespread implications on the lives of those adults and children who are adversely affected across the country.

3. It is our unequivocal opinion that Smart meters must not be forced on patients who experience a negative response to RF/EMF, and the only reasonable and humane accommodation is analog meters, the same meters we have had for many decades.

Introduction and Summary of Filing

4. Wireless-based technologies such as cell phones, Wi-Fi and smart meters use and emit pulsed electromagnetic fields (EMFs) and radiofrequency

(RF) radiation (collectively RF/EMF). Exposure to RF/EMF can be harmful, at least to some people. It can directly injure; it can exacerbate pre-existing conditions; and it can interfere with treatment.

5. The undersigned doctors have patients who suffer adverse reactions to RF/EMF, and some of the undersigned doctors themselves are adversely affected and personally experience the painful and debilitating effects of exposure.

6. Adverse effects from RF/EMF are real, proven and a major threat to some people's health**.** Human physiology has many bioelectric elements, and this is especially true of the heart, brain, nervous system, and intercellular communication. Pulsed and modulated RF/EMF are stressors that directly affect this physiology. Humans vary in their physiology and in their resilience to stressors. Some people lose the ability to cope at a lower level of exposure to toxins than others and some may never get sick.

7. The only treatment for those who suffer impairments worsened by RF/EMF exposure is avoidance. However, with the ever-growing ubiquitous, involuntary exposure to RF/EMF from wireless technology and infrastructure,[1] their home environment is the only place they have some ability to control exposure. It is their last place of refuge.

[1] https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30221-3/fulltext.

8. Mandatory smart meter deployment in homes, without a meaningful accommodation for those adversely affected by RF/EMF, will frustrate our ability to maintain or improve our patients' well-being; cause them intolerable harm; and take away from them their only possible refuge, the only place to which they have some control over exposure, and which must be a sanctuary.

9. For those who are adversely affected, having a wireless or digital smart meter is not an option. The *only* reasonable accommodation is an analog meter. It does not create the adverse elements on the electric system created by the operation of the digital/wireless "smart" meters that adversely affect them.

Electro-Sensitivity

10. The most widespread sickness associated with exposure to pulsed RF/EMF is likely "electro-sensitivity."[2] The condition is also referred to in the scientific literature as "electromagnetic hypersensitivity" (EHS), "microwave sickness" and "radiation sickness."

11. The condition is characterized by a constellation of mostly neurological symptoms that occur as a result of exposure to RF/EMF. Common symptoms include headaches, cognitive and memory problems, exhaustion, heart palpitations, anxiety-like symptoms, seizures, sleep issues, ringing in the ears,

[2] https://www.aaemonline.org/wp-content/uploads/2020/12/AAEMEMFmedicalconditions.pdf.

tingling, nausea, skin reactions, dizziness, noise sensitivity, digestive problems, and nosebleeds.

12. Electro-sensitivity is not truly a sensitivity; it is a sickness caused and/or aggravated by exposure to pulsed RF/EMF, with serious physiological complications. Many hundreds of studies have proven that RF/EMF exposure can cause and/or aggravate these symptoms[3] and the underlying injuries[4] and establish the causal mechanisms of harm.[5]

13. There are diagnosis guidelines and International Codes of Diseases classifications. Doctors and scientists warn that it is widespread, and the rates are growing. It is recognized as a disability by US agencies.[6]

---

[3] Neurological effects: https://bioinitiative.org/wp-content/uploads/2020/09/6-RFR-Neurological-Effects-Abstracts-2020.pdf; https://bioinitiative.org/wp-content/uploads/2020/10/13-Neurological-Effects-Studies-Percent-Comparison-2020.pdf.

[4] https://direct.mit.edu/neco/article/30/11/2882/8424/Diplomats-Mystery-Illness-and-Pulsed.

[5] Mechanism of harm: https://bioinitiative.org/wp-content/uploads/2020/09/3-RFR-Free-Radical-Oxidative-Damage-Abstracts-2020.pdf (oxidative stress); https://direct.mit.edu/neco/article/30/11/2882/8424/Diplomats-Mystery-Illness-and-Pulsed'; https://direct.mit.edu/neco/article/30/11/2882/8424/Diplomats-Mystery-Illness-and-Pulsed.

[6] See further discussion in the Amicus Brief. Also: https://childrenshealthdefense.org/wp-content/uploads/rf-accomodation-nibs.pdf; Dept. of Education: https://childrenshealthdefense.org/wp-content/uploads/rf-accomodation-education.pdf; Dept. of Labor: https://childrenshealthdefense.org/wp-content/uploads/rf-accomodation-labor.pdf.

14. For many of our patients, RF/EMF exposure adversely and severely affects their ability to physically and mentally function. Exposure can interfere with brain wave operation and impair blood flow to the brain. These effects can cause interference with various brain functions including sleep and cognitive functions. Exposure can also damage the blood-brain barrier (BBB) which can lead to brain damage and neurodegenerative conditions. RF/EMF interfere with the nervous system and bioelectric functions.[7]

15. Those affected react to RF/EMF exposures they were able to tolerate previously and at levels that may not evoke a negative response in others. With avoidance, the symptoms decrease and can even completely disappear. But with re-exposure they reappear. Continued exposure leads to increase in symptom frequency, severity and additional symptoms may appear. It can also worsen the underlying injuries.

16. The scientific evidence explaining causation and mechanisms of harm associated with RF/EMF injuries is now robust. Oxidative stress is an established

[7] https://direct.mit.edu/neco/article/30/11/2882/8424/Diplomats-Mystery-Illness-and-Pulsed.

mechanism of harm for RF/EMF-related injuries;[8] known physiological biomarkers and genetic predispositions[9] help us in our diagnoses.

Diagnosis Guidelines

17. There are reliable diagnostic guidelines that we use and rely on in our practice. In 2016 the European Academy for Environmental Medicine's (EUROPAEM) "EMF Working Group" developed official diagnosis guidelines: "EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses"[10] (Exhibit 1). These guidelines were developed by the world leading experts; they were peer-reviewed and published and are used by doctors in the US and around the world. They provide a comprehensive review of the scientific evidence regarding the symptoms, the physiological damage, mechanisms of harm and biomarkers associated with RF/EMF-related health effects, and they reference 235 peer-reviewed studies. The guidelines are based on the Austrian Medical Association's guidelines.[11]

18. When diagnosing the condition, we use the World Health Organization (WHO) International Classification of Diseases' Code T-66 for a

---

[8] https://direct.mit.edu/neco/article/30/11/2882/8424/Diplomats-Mystery-Illness-and-Pulsed.

[9] https://www.hindawi.com/journals/mi/2014/924184/.

[10] https://pubmed.ncbi.nlm.nih.gov/27454111/.

[11] https://ecfsapi.fcc.gov/file/1092912632123/48-Attachment%2048-%20Austrian%20Medical%20Assoc%20Guideline%20EMF%20Disease.pdf.

diagnosis of "Radiation Sickness" and Code W90 which recognizes that "Exposure to Other Nonionizing Radiation" can cause injury.

19. The knowledge regarding the etiology of the condition is constantly evolving. Professor Dominique Belpomme is a member of the EMF Working Group that developed the diagnosis guidelines. Since 2009, he and his team have been conducting extensive testing on people who suffer from electro-sensitivity to identify the underlining injuries and biomarkers. They have tested over 700 people. Some of the lab tests recommended by the EUROPAEM's guidelines are based on his work.[12] To keep doctors appraised of the newly identified biomarkers, in 2020 he published peer-reviewed guidelines[13] to reflect the most current findings and biomarkers to help doctors diagnose, treat, and prevent this condition.[14]

20. We also consult with guidelines from clinics specializing in diagnosis of RF/EMF-related injuries such as those developed by Professor Riina Bray, MD, BASC, MSC, FFCP, MHSC. Prof. Bray leads the largest government hospital

---

[12] https://pubmed.ncbi.nlm.nih.gov/26613326/.

[13] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7139347/.

[14] Belpomme's studies provide clear evidence of physiological biomarkers indicating serious physiological injuries, and he concludes that these findings negate the hypothesis that electro-sensitivity could be psychosomatic or caused by a "nocebo" effect. These studies include objective tests that measure physiological reactions, not subjective perception, and prove that electro-sensitivity and exposure can lead to severe injuries.

clinic specializing in diagnosing electro-sensitivity.[15] Her diagnosis guidelines[16] are based on the knowledge she and the seven doctors in the clinic accumulated over the past 23 years seeing many hundreds of patients with electro-sensitivity (Exhibit 2).

Clinical Diagnosis

21. Those who suffer from electro-sensitivity develop symptoms from RF/EMF exposure. However, the underlying physical injury may be different from one patient to another, because pulsed RF/EMF can cause various physiological injuries.

22. For example, a peer-reviewed study on 675 subjects with electro-sensitivity[17] showed that 28% had leakage of the blood-brain barrier; 40% had chronic inflammation indicating oxidative stress; 23% had autoimmune antibodies; and 100% had reduced melatonin levels. Substantive scientific evidence shows that each of these injuries can be caused by pulsed RF/EMF exposure.

23. For this reason, there is no one test for diagnosis and therefore, as with many other conditions, the diagnosis must be clinical, involve direct

---

[15] https://www.womenscollegehospital.ca/care-programs/environmental-health-clinic/.

[16] https://www.womenscollegehospital.ca/assets/pdf/environmental/Preliminary%20Clinical%20Guidelines%20%20for%20EHS.pdf.

[17] https://pubmed.ncbi.nlm.nih.gov/26613326/.

evaluation of the patient, and requires medical judgment. Diagnosis is based on identifying the underlying cause of the patient's complaints based on symptoms and medical history rather than on one specific test. Not all ailments have classic signs from blood tests or imaging, and in lieu of these, a physician must use clinical judgment to draw a reasonable and sensible conclusion based on personal and direct observation and the scientific literature.[18]

24. When taking a patient's medical history, we look for description of situations which would be the equivalent of a blinded test, i.e., situations in which the patient was unaware of the exposure and the appearance of symptoms was a clear result of the exposure; and vice versa, where the source of exposure was removed without the knowledge of the patient and the symptoms improved. We also look for evidence of physiological reactions which are not based on subjective perception and on "natural experiment": if exposure elimination/reduction leads to diminished symptoms, then avoidance is the recommended treatment.

25. When relevant and possible, we support our clinical diagnosis with the lab tests suggested by the diagnosis guidelines. These lab tests are based on

[18] We understand that the utility's medical expert's opinion was formed and expressed without any direct contact or personal evaluation of the Complainants below, whereas the Complainants' medical evidence was based on personal knowledge, at least in part. Remote diagnostics are contra-indicated, especially in this area. The Commission's decision to accept the utility's medical evidence over that of an actual attending physician is highly questionable. We note that the federal disabilities rules expressly discount remote "records-only" evaluations.

biomarkers that have been associated with exposure to RF/EMF. For example, we use blood tests for free radicals that indicate oxidative stress damage because oxidative stress is a well-recognized mechanism of harm of RF/EMF exposure.[19]

26. Our patients' symptoms can be very severe and debilitating and for many, they significantly affect major life functions. This is so regardless of the name attached to the condition or its alleged controversial nature.

Recognition

27. US agencies have recognized the condition as a disability entitled to accommodations including: the US Access Board;[20] National Institute of Buildings Science;[21] the Department of Labor;[22] the Department of Education;[23] and the

---

[19] Many studies have shown that RF/EMF cause oxidative stress, and it is a recognized underlying mechanism for EMF-related sicknesses, including electro-sensitivity. https://bioinitiative.org/wp-content/uploads/2020/09/3-RFR-Free-Radical-Oxidative-Damage-Abstracts-2020.pdf; https://pubmed.ncbi.nlm.nih.gov/26151230/.

[20] https://childrenshealthdefense.org/wp-content/uploads/rf-accomodation-access-board.pdf#page=3.

[21] The report concludes that RF/EMF is an "access barrier" and can render buildings "inaccessible" to those with electro-sensitivity and provides accessibility guidelines. https://www.access-board.gov/research/building/indoor-environmental-quality/; https://childrenshealthdefense.org/wp-content/uploads/rf-accomodation-nibs.pdf.

[22] https://childrenshealthdefense.org/wp-content/uploads/rf-accomodation-labor.pdf.

[23] In 2011, DOE issued a memorandum regarding accommodation of people with Multiple Chemical Sensitivities ("MCS"). It included recommendations to minimize exposure to EMFs and to ensure the home environment is a "sanctuary," free from

Social Security Administration. In their publications some of these agencies explain that accommodation of those affected by RF/EMF should be removal/minimizing exposure and that their home should be a sanctuary free from EMF.

28. In the past couple of decades, and mainly in the past 10 years, the number of patients we see in our clinics who suffer greatly from RF/EMF has grown.[24] This is not surprising given the exponential increase in wireless deployment and use. The general public faces constant saturation in all public places and in the workplace.[25]

29. This sickness has been recognized by courts and by many medical and official international organizations such as the Council of Europe[26] and the

---

EMFs because they may trigger symptoms. https://childrenshealthdefense.org/wp-content/uploads/rf-accomodation-education.pdf#page=5.

[24] See statement from the American Academy of Environmental Medicine: https://www.aaemonline.org/wp-content/uploads/2020/12/AAEMEMFmedicalconditions.pdf.

[25] https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30221-3/fulltext.

[26] Resolution 1815 (2011) Section 8.1.4: "pay particular attention to "electrosensitive" people who suffer from a syndrome of intolerance to electromagnetic fields and introduce special measures to protect them, including the creation of wave-free areas not covered by the wireless network." Available at http://assembly.coe.int/nw/xml/XRef/Xref-XML2HTML-en.asp?fileid=17994&.

European Parliament which stated in a resolution that the rates of electro-sensitivity are growing "exponentially."[27]

30. In 2019, the New-Hampshire legislature voted unanimously to establish a committee to study the effects of 5G and wireless radiation. The committee was comprised of scientists, public officials, and representatives of the wireless industry (through CTIA, the wireless industry lobby association). Following a year of hearing expert testimony and reviewing the science, the committee's majority report, published in October 2020, concluded that wireless radiation can be harmful. The report acknowledged electro-sensitivity and the need to accommodate those who suffer from the condition. It emphasized the need to educate doctors.[28]

31. Indeed, doctors' awareness of RF/EMFs harms is constantly growing. The California Medical Association passed a Resolution which highlighted RF/EMF effects consistent with electro-sensitivity. In 2021, close to 200 physicians participated in a medical conference about health effects associated

---

[27] European Parliament Written declaration on the recognition of multiple chemical sensitivity and electrohypersensitivity in the International Statistical Classification of Diseases and Related Health Problems. Available at https://www.europarl.europa.eu/doceo/document/DCL-7-2012-0014_EN.pdf?redirect.

[28] http://www.gencourt.state.nh.us/statstudcomm/committees/1474/reports/5G%20final%20report.pdf.

with RF/EMF exposure.[29] Participants received continued medical education (CME) credits.

32. We have no doubt that for some of our patients, RF/EMF are the cause of their symptoms. Only those who have not had patients who are affected, have not performed direct evaluations or are ignorant of the scientific and medical literature and the operation of the human body, can doubt these patients and their suffering from pulsed RF/EMFs.

Smart Meter Specific Issues

33. The problems with smart meters arise not only from the RF signal used to wirelessly transfer the data to the utility company. A major problem is that smart meters inject pulsed RF and extremely low-frequency (ELFs) EMFs over a house's electric wiring, effectively turning the entire home into a radiating antenna. Locating the smart meter further away from the house is not an acceptable solution or reasonable accommodation because it does not eliminate this "antenna" effect.[30]

34. This problem is exacerbated because the RF/EMF that enter the electric system are intensely pulsed,[31] and pulsation has consistently been

[29] https://emfconference2021.com/.

[30] See expert engineer Erik Anderson statement which is part of the amicus brief.

[31] https://docs.cpuc.ca.gov/PublishedDocs/EFILE/BRIEF/171336.PDF.

identified as a central element in RF/EMF related injuries.[32] EMFs used for medical treatments are pulsed because the pulsation makes the signal more bioactive.[33]

35. Some of our patients reported symptom onset after a smart meter was installed on their homes. Many were not aware of the installation at the time, did not suffer from adverse effects from wireless devices and had no idea that these meters or any wireless device can cause harm. In many of the cases, the association between the meter installation and the appearance of symptoms is clear.[34]

36. However, the best evidence of the adverse effects of these meters is the changes we see almost immediately after a smart meter is removed and replaced with an analog meter. Our patients' symptoms usually disappear or at least significantly lessen.

37. Adverse reactions which are not affected by subjective perception disappear and thus the evidence is indisputable and cannot be deemed a "nocebo" effect. It establishes clear and direct causation. For example, a common symptom we see in patients from smart meters is nosebleeds, including in children. When the

---

[32] https://ecfsapi.fcc.gov/file/10709642227609/Carlo%20paper%20%20Real%20versus%20Simulated%20Mobile%20Phone%20Exposures%20in%20Experimental%20Studies.pdf.

[33] https://ecfsapi.fcc.gov/file/7520940777.pdf.

[34] https://ecfsapi.fcc.gov/file/7520958363.pdf.

family has the smart meter removed, the nosebleeds usually disappear almost overnight. Studies have explained the mechanism behind pulsed RF/EMF exposure and nosebleeds.[35]

38. We must emphasize that the question of initial causation is irrelevant. The smart meter may or may not be the source that first generates symptom onset. What is relevant is that once a person begins to react to pulsed RF/EMFs, any and all exposure must be avoided, since avoidance is the primary and only truly effective treatment. People can turn off a cell phone, but they cannot turn off the smart meter or shield themselves from its effects.

39. People with major life function impairments require accommodation, without regard to initial cause. The accommodation requirement merely allows them to better function and have some chance of a tolerable life.

40. Forcing smart meters on our patients who are adversely affected by RF/EMF, in their homes, means exposing them 24/7 to a toxin that instigates dysfunction, tormenting pain and severe physiological injuries and reactions, some of which can be life-threatening.

41. Our patients and those like them cannot be required to endure exposure that is toxic and can be even deadly to them in their own home as a

[35] https://ecfsapi.fcc.gov/file/1091442657471/Cuban%20Embassy-Beatrice%20Golomb%20PhD-Microwave%20Attack.pdf#page=20.

condition of utility service. If they cannot have a safe environment in their homes, their condition will undoubtedly worsen and can result in death. Their home is their only refuge.

42. The main recommendation to our patients beyond avoidance is to contact professionals who specialize in EMF mitigation, to help them mitigate RF/EMF exposure and shield the home from outside exposure sources. However, no amount of shielding can protect those who are sick from the effects of smart meters, since they turn the home's electric wiring into a transmitting antenna. This is the worst-case scenario for the electro-sensitive.

Summary

43. Based on our knowledge and experience, we unequivocally determine that wireless and digital "smart" meters must not be forced on those who suffer adverse reactions from RF/EMF exposure. Those who are affected must have the choice of mechanical analog meters. Any other outcome will lead to immense suffering and even death. It would be unconscionable.

44. This accommodation is necessary, simple and reasonable. All that is required is to allow them to use the same mechanical analog utility meter that was installed for many decades on homes.

Respectfully Submitted,

Physicians Statement Signatories

Prashanthi Atluri, MD, *Cardiology*, OH

Tiffany Baer, MD, *Internal Medicine*, TX

Sunil Bhat, DO, *Family Medicine*, PA

Anthony Bianco, DO, *Family Medicine*, OH

Michael Blahut, DO, *Family Medicine*, PA

Mark Brody, MD, *Primary Care*, *Integrative Medicine*, RI

Larry Burk, MD, *Radiology*, NC

Maria Carrascal, MD, *Pediatrics*, Puerto Rico

David Calderwood, MD, Family Medicine, AL

Lora Chamberlain, DO, *Family Medicine*, IL

Jaqueline Chan, DO, *Family and Integrative Medicine*, CA

Barbara A. Crothers, DO, *Pathology*, MD

Diane Culik, MD, *Family Medicine*, MI

Paul Dart, MD, *Family Practice Physician*, OR

Sandra Denton, MD, *Family Medicine, Alternative Medicine, Emergency Medicine*, AK

Tim Dooley, MD, *Integrative Medicine*, CA

Robyn Dreibelbis, DO, *Family Medicine*, OR

Victoria Dunckley, MD, *Psychiatry*, CA

Ben Edwards, MD, *Functional Medicine*, TX

Erica Elliot, MD, *Family and Environmental Medicine*, NM

Tracy Freeman, MD, *Internal Medicine*, MD

Deborah Ginsburg, MD, *Family Medicine, Special Needs*, NJ

Melanie Gisler, DO, *Family Medicine*, CA

Sharon Goldberg, MD, *Internal and Integrative Medicine*, NM

Stephen Grable, MD, *Internal Medicine*, FL

Margaret Heinze, MD, *Family Medicine*, WI

Martha Herbert, MD PhD, *Pediatric Neurologist*, MA

Michael Hilts, MD, *Family Medicine*, NC

Jeanne Hubbuch, MD, *Family Medicine*, MA

Toril Jelter, MD, *Pediatrics*, CA

Lyn Johnson, DO, *Family Medicine*, FL

Bob Kaplan, MD, *Diagnostic Radiology*, AZ

Stacy Kuhns, MD, *Pediatrics*, PA

Christopher Lawinski, MD, *Integrative Medicine*, HI

Janet Levatin, MD, *Pediatrics*, OH

Stephanie McCarter, MD, *Internal Medicine*, TX

Lawrence McKnight, MD, *Internal Medicine*, PA

Jorge Moreno, DO, Family Medicine, CA

Leah Morton, MD, *Family Medicine*, NM

Gerald Natzke, DO, *Assistant Clinical Professor, Michigan State University, Environmental Medicine, Allergies*, MI

Raymond Oenbrink, DO, *Family Medicine*, NC

Kara Parker, MD, *Family Medicine, Functional Medicine, and Integrative Health*, MN

Jessica Peatross, MD, *Internal and Functional Medicine*, NC

Michelle Perro, MD, *Pediatrics, Integrative Medicine*, CA

Diane Powell, MD, *Psychiatry*, OR

Peter Prociuk, MD, *Internal Medicine*, PA

Kirsten Reynolds, MD, Family Medicine, WI

David G. Schwartz, MD, *Family Medicine*, VA

Jennifer Shaw, MD, *Obstetrics and Gynecology*, AZ

Pam Shervanick, DO, *Psychiatry*, ME

Frank Sievert, MD, *Family Medicine*, OR

Ana-Maria Temple, MD, *Pediatrics*, NC

Robert Turner, MD, *Neurology*, SC

Kevin Wand, DO, *Family Medicine*, MN

Jane Williams, MD, *General Surgery*, CA

Savely Yurkovsky, MD, *Cardiology, Internal Medicine, Pediatrics*, NY

James Ziobron, DO, *Family Medicine*, MI

SCIENTISTS STATEMENT

IN THE SUPREME COURT OF PENNSYLVANIA
MIDDLE DISTRICT

RE: No. 34 MAP 2021, *Povacz, M, et al. v. PUC*
Associated Case(s):
35 MAP 2021 Consolidated
36 MAP 2021 Consolidated
37 MAP 2021 Consolidated
38 MAP 2021 Consolidated
39 MAP 2021 Consolidated
40 MAP 2021 Consolidated
41 MAP 2021 Consolidated
42 MAP 2021 Consolidated
43 MAP 2021 Consolidated
44 MAP 2021 Consolidated
45 MAP 2021 Consolidated

SCIENTISTS' STATEMENT

RF/EMF & SMART METERS HARM

THE EFFECTS OF PULSED RADIOFREQUENCY AND ELECTROMAGNETIC RADIATION EMISSIONS OF SMART METERS; ESPECIALLY AS IT PERTAINS TO THOSE ADVERSELY AFFECTED

General Statement

We, the undersigned scientists, have cumulatively published hundreds of peer-reviewed papers on biological effects of pulsed electromagnetic fields (EMFs) and radiofrequency (RF) radiation and reviewed thousands more. For all of us the study of the effects of pulsed RF/EMFs is one of our main areas of study; for some, it is the main one. (A short bio for each of the undersigned is attached.)

We are filing this statement to clarify the state of the current science regarding RF/EMF-based wireless technology adverse health effect and to explain why smart meters can be harmful, at least to some people. Pulsed RF/EMF-based wireless technology harms are not hypothetical. They are scientifically established, and a significant number of people have already been seriously injured. Therefore, we cannot stand by and allow the science to be misrepresented, especially in a case of such importance involving public safety, where lives are at stake, the harms are irreparable, and people are injured and could die.

RF Basics

1. Wireless technology uses electromagnetic waves to carry information.1 A wave "frequency" is the number of wave cycles per second. Each cycle per second equals a "Hertz" ("Hz").2 Example: A 60 Hz frequency used for home electricity has 60 wave cycles per second. The smart meter antenna that

---

[1] An electromagnetic field (EMF") is created by electric and magnetic components emitted by moving charges and propagated through "waves" at the speed of light. The interaction between the electric and magnetic fields "radiates" energy ("radiation"). The electromagnetic spectrum is divided into classes: Extremely Low Frequencies (ELFs), radio frequencies (microwaves are a subgroup of RFs), infrared, visible light, ultraviolet, X-rays and gamma rays. RFs have a wave-cycle between 3 kilohertz and 300 gigahertz

[2] 1,000 Hz is a kilohertz ("KHz"). 1,000,000 Hz is a megahertz ("MHz"). 1,000,000,000 Hz is a gigahertz ("GHz").

transmits the usage data uses frequencies around 900 MHz, or about 900 million wave cycles per second.

2. The Radio-Frequency ("RF") "signal" is the "carrier wave." But communications require carrier wave manipulation to "encode" the data. Two main techniques are used: "pulsation" and "modulation." Modulation places additional "mini"-waves on the RF. Pulsation injects "bursts" or turns the signal on/off. Different technologies have their own protocols or "code." Two devices using the same code can "communicate" and exchange information.

3. Smart meters operate in the same way. They contain an RF antenna that wirelessly transmits the usage data to the utility company. The antenna's carrier wave is around 900 MHz, but the data usage is transferred by modulating the carrier wave. Furthermore, the communications occur every few seconds, so the transmissions alternate between "silent" and "active." This leads to an intensely pulsed signal that has a jarring "on/off" effect on the body.

4. RFs emit "non-ionizing" radiation. Non-ionizing radiation does not have sufficient energy to directly pull electrons from atoms and molecules to create "ionization." The FCC guidelines assume that non-ionizing radiation is not harmful, unless it has high intensity power that causes tissue to heat as it absorbs the radiated energy. This is called the "thermal effect." The FCC's regulations

acknowledge only thermal effects. Considering many thousands of studies have proven non-thermal effects, this assumption cannot be defended.

CHD v. FCC and FCC Admission of Harm

5. On August 13, 2021, in a case amici Children's Health Defense brought against the FCC, the US Court of Appeals for the DC Circuit ruled that the FCC failed to adequately consider and address the scientific and medical evidence showing that its 1996 thermally-based guidelines do not sufficiently protect the public. The Court held the FCC did not fully consider non-thermal harms other than cancer effects, and as a result failed to engage in reasoned decision making.[3]

6. The FCC will have a hard time sticking to its current "no non-thermal harm" construct on remand since it recently admitted there are neurological harms from RF exposures, at least in the range between 3 Hz and 10 MHz.[4] The FCC noted "[a]dverse neural stimulation effects …such as perception of tingling, shock, pain, or altered behavior due to excitation of tissue in the body's peripheral nervous system." It also admitted that these harms occur *instantaneously*, which

[3] *Envtl. Health Tr., et al v. FCC*, Nos. 20-1025, 20-1138, 2021 U.S. App. LEXIS 24138 (D.C. Cir. Aug. 13, 2021).

[4] *Proposed Changes in the Commission's Rule Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communication Commission Radiofrequency Exposure Limits and Policies*, ¶¶122-124 & nn. 322-335, 34 FCC Rcd 11687, 11743-11745 (2019).

means the FCC's current method of averaging exposure levels over 30 minutes – which completely obscures pulsation effects – is entirely inappropriate.[5]

The Scientific Consensus of Non-Thermal Harms

7. Some of the scientists who signed below published the evidence presented in the DC Circuit court case, including the BioInitiative Report (BioInitiative).[6] The Bioinitiative is the most comprehensive scientific review on the biological and health effects of Electromagnetic Fields (EMF) and RF-based wireless technology by independent scientists (those with no conflict of interests). The Bioinitiative concluded that bioeffects are established and can occur within minutes of exposure to even very low levels of RF, including those emitted by smart meters. With chronic exposures the biological effects can become adverse effects and result in illness.[7]

8. Humans are bioelectrical beings. Our bodies use internally-generated non-thermal EMFs to function. Our physiology is dependent on very sensitive bioelectric systems, especially the heart, brain, nervous system, and intercellular

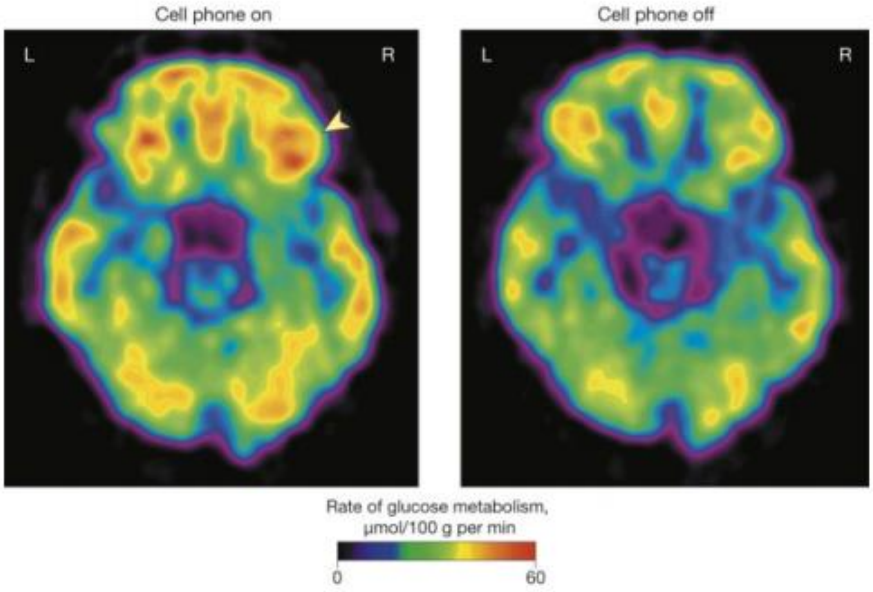
[5] The Engineer's Report attached to the amicus brief reveals that smart meters pulse RF frequencies within this range (3 kHz – 50 KHz). The utility's evidence below relied in part on the FCC's 30-minute averaging as the basis to deny any negative pulsation effects.

[6] https://bioinitiative.org/participants/.

[7] https://bioinitiative.org/conclusions/.

communication.[8] As the FCC stated in its admission, externally generated EMF interferes with humans' internal electrical communications system, and evokes internal biological responses. These responses have nothing to do with power level or tissue heating. The direct effect of pulsed RF/EMFs on humans' physiology are indisputable.

9. A 2011 National Institutes of Health ("NIH") study[9] is sufficient by itself to destroy any denial of RF biological effects. Brain scans of 47 human participants revealed that pulsed non-thermal RF radiation induced biological brain glucose metabolism changes in every subject. See image below.



[8] https://childrenshealthdefense.org/wp-content/uploads/rf-martin-blank.pdf.

[9] https://pubmed.ncbi.nlm.nih.gov/21343580/.

10. Denial of biological effects of RF/EMFs cannot co-exist with the fact that physicians routinely use FDA-approved, non-thermal pulsed EMF devices to treat diseases, bone fractures10 and chronic pain,[11] or that RF/EMF is used to treat cancer.[12]

11. The only question is whether the biological responses can be adverse. Numerous studies show indisputable evidence of adverse responses to pulsed RF/EMF exposure on various bodily functions, especially when the RF exposure is chronic and pulsed (like the exposure to smart meters).

12. Biological and even positive effects can become adverse effects. RF signals affect living tissue and stimulate biochemical and bioelectrical changes, which can generate biological effects which then, with chronic exposure, can become adverse effects and cause various symptoms and may lead to sickness.[13] A good example of this mixed effect comes from the immune system: "short-term exposure… may temporarily stimulate certain humoral or cellular immune functions, while prolonged irradiation inhibits the same functions."[14]

---

[10] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3441225/.

[11] https://www.accessdata.fda.gov/cdrh_docs/pdf19/K190251.pdf "the application of electromagnetic energy to non-thermally treat pain."

[12] https://childrenshealthdefense.org/wp-content/uploads/rf-medical-treat-cancer.pdf.

[13] https://bioinitiative.org/conclusions/.

[14] https://www.sciencedirect.com/science/article/abs/pii/S0048969713003276.

Scientific Consensus

13. Numerous scientists,[15] doctors, and medical and scientific organizations from the US and around the world have warned of the negative non-thermal effects of RF/EMF and the growing sickness it has been causing. They include the EMF Scientist organization (250 scientists who combined published over 2,000 peer-reviewed papers on the effects of RF/EMF);[16] the American Academy of Pediatrics; [17] the Austrian Medical Association;[18] and doctors' appeals from the US;[19] Belgium;[20] and Germany.[21] In 2021, close to 200 physicians participated in a medical conference about RF/EMF effects, for which they received medical continuing education credits.[22]

---

[15] https://childrenshealthdefense.org/wp-content/uploads/rf-2017-expert-letters-compilation.pdf.

[16] https://www.emfscientist.org;https://ecfsapi.fcc.gov/file/10916233196437/International_EMF_Scientist-Appeal%208-25-2019.pdf.

[17] https://childrenshealthdefense.org/wp-content/uploads/rf-2013-american-academy-of-pediatrics.pdf.

[18] https://childrenshealthdefense.org/wp-content/uploads/rf-2011-austrian-medical-association-guidelines.pdf.

[19] Baby Safe Project: https://www.babysafeproject.org/joint-statement.

[20] Appeal of 539 Belgium Doctors: https://en.hippocrates-electrosmog-appeal.be/medical.

[21] Appeal of 1,000 German doctors http://freiburger-appell-2012.info/media/International_Doctors_Appeal_2012_Nov.pdf.

[22] https://emfconference2021.com/faculty/.

14. A California Medical Association resolution[23] concludes that the peer-reviewed research demonstrates wireless RF/EMF adverse effects, including "single and double stranded DNA breaks, creation of reactive oxygen species, immune dysfunction, cognitive processing effects, stress protein synthesis in the brain, altered brain development, sleep and memory disturbances, ADHD, abnormal behavior, sperm dysfunction, and brain tumors."

15. Causal mechanisms of harms have been established. Oxidative Stress is one such mechanism. Over 90% of studies on RF and oxidative stress[24, 25] have established that indeed exposure to RF/EMFs induces an increase in free radicals, and chronic exposure causes oxidative stress which leads to several adverse health effects: disease, dysfunction, including electro-sensitivity, cancer, and DNA damage.

16. Even though RF does not have the energy to directly break chemical bonds (the way ionizing radiation does), there is strong scientific evidence that this energy can indirectly cause DNA damage.[26] Dr. Ron Melnick PhD, a retired

---

[23] https://childrenshealthdefense.org/wp-content/uploads/rf-2014-ca-medical-association-resolution.pdf.

[24] https://bioinitiative.org/wp-content/uploads/2020/09/3-RFR-Free-Radical-Oxidative-Damage-Abstracts-2020.pdf.

[25] https://childrenshealthdefense.org/wp-content/uploads/rf-2015-yakymenko-oxidative-stress.pdf.

[26] https://bioinitiative.org/wp-content/uploads/2020/09/10.-Comet-Assay-Studies-Percent-Comparison-2020.pdf.

National Institute of Environmental Health Science (NIEHS) scientist, was the Senior Toxicologist and Director of Special Programs in the National Toxicology Program (NTP).[27] He stated that the old notion that non-ionizing RF cannot break DNA "should [be] put to rest."[28]

17. Many thousands of studies, including US government and military studies and reports, show the biological and adverse effects of pulsed RF/EMFs.[29] In 2014 the US Department of Interior concluded that the FCC's thermally-based guidelines are "nearly 30 years out of date and inapplicable today."[30]

18. The clear majority of studies show adverse effects.[31] For example, 244 of the 335 total studies (73%) published on neurological effects of RF Radiation between 2007 and 2020 found effects.[32] Of the 261 total studies on RF radiation

---

[27] https://emfconference2021.com/speaker/ronald-l-melnick-phd/.

[28] https://microwavenews.com/news-center/ntp-comet-assay.

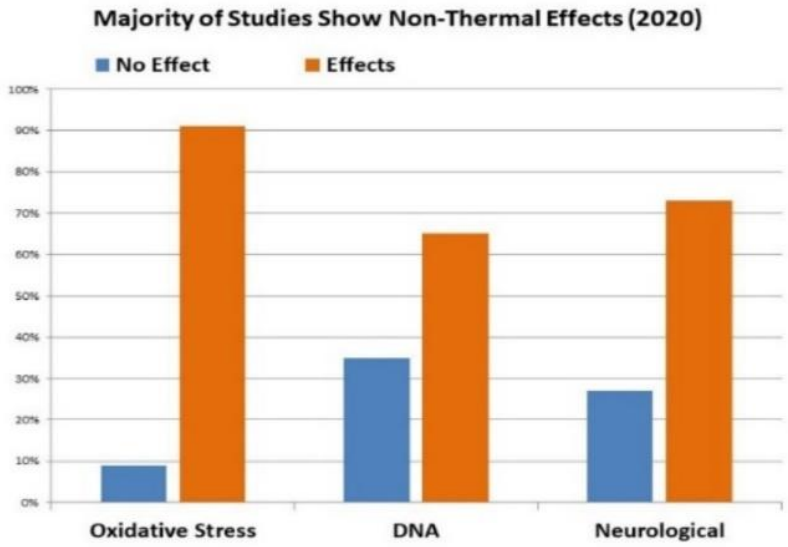
[29] Navy report includes 2,300 studies. Pages 10-14 list the RF effects found. https://childrenshealthdefense.org/wp-content/uploads/rf-1971-navy-2300-studies.pdf; Air-Force: https://electroplague.files.wordpress.com/2014/09/rf-microwave-radiation-biological-effects-rome-labs.pdf; NASA https://www.orsaa.org/uploads/6/7/7/9/67791943/_____nasa_emf_field_interactions_-_observed_effects___theories_1981.pdf.

[30] https://drive.google.com/file/d/1XqbMLFUkVNUZIB5AFJAjr6KWqL6vK8ud/view.

[31] https://bioinitiative.org/research-summaries/.

[32] https://bioinitiative.org/wp-content/uploads/2020/10/13-Neurological-Effects-Studies-Percent-Comparison-2020.pdf.

and oxidative stress, 240 (91%) show effects.[33] 224 of 346 total studies (65%) show DNA damage. See image below.[34, 35]



19. The evidence is getting even stronger. Since 2016, when the evidentiary record in this case was generated, hundreds more published peer-reviewed studies, including by the US government, have established RF/EMF effects.[36]

---

[33] https://bioinitiative.org/wp-content/uploads/2020/09/9.-Free-Radical-Studies-Percent-Comparison-2020.pdf.

[34] https://bioinitiative.org/wp-content/uploads/2020/09/11-Genetics-Percent-Graphic-Sept-1-2020.pdf.

[35] https://bioinitiative.org/wp-content/uploads/2020/09/10.-Comet-Assay-Studies-Percent-Comparison-2020.pdf.

[36] Abstract of over 700 papers (positive and negative published 2016-2019) https://childrenshealthdefense.org/wp-content/uploads/rf-jmm-2016-2019-studies.pdf; US Government NTP DNA Study https://onlinelibrary.wiley.com/doi/full/10.1002/em.22343.

20. For example, in 2021 the Swiss government expert advisory group on electromagnetic fields and non-ionizing radiation, BERENIS,[37] evaluated the scientific literature on non-thermal RF/EMF.[38] The committee published a preliminary paper which concludes that exposure could cause or worsen several chronic illnesses, and that children, the elderly and people with immune deficiencies or diseases are especially at risk. It also acknowledged that oxidative stress is the underlying causal mechanism of harm.

21. In 2019, the New-Hampshire (NH) legislature voted unanimously to establish a committee to learn the effects of 5G and wireless radiation. The committee included scientists, public representatives, and representatives of the wireless industry (through CTIA, the wireless industry lobby association). After a year of hearing experts on both sides and reviewing the science, in October 2020, the committee's report was published. It concluded that wireless radiation non-thermal harms are established. The committee recognized Electro-sensitivity and the right for accommodation of those who suffer and emphasized the need to

---

[37] https://www.bafu.admin.ch/bafu/en/home/topics/electrosmog/newsletter-of-the-swiss-expert-group-on-electromagnetic-fields-a/beratende-expertengruppe-nis-berenis.html.

[38] https://childrenshealthdefense.org/wp-content/uploads/rf-swiss-berenis-2021-report.pdf.

educate doctors. NH is the only state in the US that has conducted an independent full-scale investigation as to the harms of these technologies.

22. Former senior experts from government agencies responsible for this issue are also part of the consensus on non-thermal harms. In addition to Dr. Melnick, they also include: *Dr. Linda Birnbaum*, the former director (2009-2019) of the National Institute of Environmental and Health Sciences (NIEHS); [39] *Dr. Christopher Portier*, [40] former director of the National Center for Environment Health at the Centers for Disease Control and Prevention (CDC), who also carried various senior positions in the NIEHS, including Associate Director of the National Toxicology Program (NTP). He wrote: "Most scientists consider non-thermal effects as well established;"[41,] *Dr. Carl Blackman*,[42] a biophysicist who worked as a research scientist for the EPA from 1970 until his recent retirement. Dr. Blackman's research on RF/EMF resulted in several discoveries including

[39] https://childrenshealthdefense.org/wp-content/uploads/sandri-birnbaum-amicus-motion-and-brief-correct-final-8-6-2020.pdf#page=20.

[40] https://www.iarc.who.int/wp-content/uploads/2018/07/PORTIER_Bio.pdf; https://pubmed.ncbi.nlm.nih.gov/27656641/.

[41] https://childrenshealthdefense.org/wp-content/uploads/rf-2016-portier-consensus.pdf#page=1.

[42] http://www.icems.eu/docs/Bios_Blackman.pdf.

multiple pulsation effects[43] and treatment using RF/EMF.[44] He is part of the BioInitiative Working Group and wrote the 2007 Report's section on pulsation and modulation;[45] *Dr. Alan Frey*,[46] a US navy funded scientist was the first to show non-thermal auditory effects and blood-brain barrier leakage. His studies tie pulsation to the aggravating effects of RF signals.

Electro-Sensitivity

23. Electro-sensitivity is the earliest reported and likely the most direct manifestation of RF/EMF-induced sickness. The condition, described by the appearance of mostly neurological symptoms caused by RF/EMF exposure, has been documented in the scientific literature for many decades, including by many US government and military studies and reports.[47] Many hundreds of studies

---

[43] https://www.emfanalysis.com/wp-content/uploads/2015/06/blackman-modulation-2009.pdf.

[44] https://pubmed.ncbi.nlm.nih.gov/28930547/.

[45] https://bioinitiative.org/wp-content/uploads/pdfs/sec15_2007_Modulation_Blackman.pdf.

[46] https://www.cellphonetaskforce.org/the-work-of-allan-h-frey/.

[47] https://childrenshealthdefense.org/rf-1971-navy-2300-studies/; https://electroplague.files.wordpress.com/2014/09/rf-microwave-radiation-biological-effects-rome-labs.pdf; https://www.orsaa.org/uploads/6/7/7/9/67791943/_____nasa_emf_field_interactions_-_observed_effects___theories_1981.pdf.

confirm the neurological effects and other symptoms[48] reported by those who suffer from the condition, and they have identified a genetic predisposition.[49]

24. The understanding of etiology, mechanisms and underlying injuries involved with this condition has significantly progressed since 2016. New diagnosis guidelines by leading EMF scientists and medical doctors have been developed and published [50,51] There are more known biomarkers for diagnosis.[52]

25. Professor Beatrice Golomb, MD PhD was to the first to show compelling evidence in a 2018 paper that the "mystery illness" (aka "Havana Syndrome") suffered by some US diplomats in Cuba and China was likely caused by pulsed RF/EMF.[53] She concluded that the diplomats suffer from Electro-sensitivity, which she refers to as Microwave Illness.[54]

---

[48] https://childrenshealthdefense.org/wp-content/uploads/rf-2018-neurological-lai-book-chapter.pdf.

[49] https://pubmed.ncbi.nlm.nih.gov/24812443/.

[50] https://www.degruyter.com/document/doi/10.1515/reveh-2016-0011/html.

[51] https://www.womenscollegehospital.ca/assets/pdf/environmental/Preliminary%20Clinical%20Guidelines%20%20for%20EHS.pdf.

[52] https://emf-experts.news/wp-content/uploads/2020/09/Belpomme-EHSdiagnosis-Study2020.pdf.

[53] https://pubmed.ncbi.nlm.nih.gov/30183509/.

[54] "Microwave" is a subclass of RF, and generally comprises frequencies between 300 MHz and 300 GHz. From an FCC nomenclature perspective, the "microwave" portion is anything above 890 MHz.

26. The US State Department asked the National Academy of Sciences, Engineering and Medicine (NAS) to analyze and provide input on the diplomats' "mystery illness." Prof. Golomb was invited to present to the committee.[55] In December 2020, The NAS report was published. [56] It concluded that many of the observed symptoms are consistent with the scientific literature on the effects of pulsed RF exposure, and that it is likely the cause of the diplomats' sickness.

27. Not all the diplomats became ill, only some, similar to Electro-sensitivity in the general population. Human physiology varies, and as with other stressors, some people get sick sooner than others or at lower levels of exposure than others, and some will never become ill.

28. Prof. Golomb's paper shows Electro-sensitivity can occur as the byproduct of wireless technology, whether the result of an intentional assault through a pulsed RF/EMF weapon or by commercial wireless technology. The harm caused by these weapons comes primarily from the pulsation, not the intensity of the RF/EMF. Indeed, it would be possible for RF/EMF weapons to operate entirely within FCC guidelines and still cause harm from pulsation. Pulsation is also a driver of the harm flowing from commercial RF/EMF-emitting

---

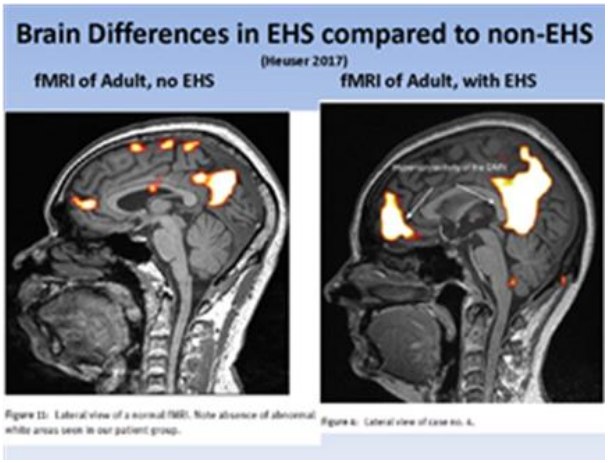
[55] https://childrenshealthdefense.org/wp-content/uploads/rf-2018-golomb-diplomats-3.pdf; https://childrenshealthdefense.org/wp-content/uploads/rf-nas-golumb-email.pdf.

[56] https://www.nap.edu/read/25889/chapter/1.

technology, including smart meters. Nevertheless, FCC rules regarding wireless technology ignore their effects.

29. Electro-sensitivity is not a mere "sensitivity." Studies have shown that the symptoms indicate severe physiological injuries associated with exposure to RF/EMF.[57]

30. A 2017 functional MRI study observed brain injury in persons with Electro-sensitivity.[58] The scans for each of the 10 subjects had similar abnormalities, all resembling those flowing from traumatic brain injury. The diplomats had the same abnormalities. This injury indicates impaired blood flow in certain regions of the brain.



[57] https://pubmed.ncbi.nlm.nih.gov/26613326/.

[58] https://pubmed.ncbi.nlm.nih.gov/28678737/.

31. A 2020[59] and a 2015[60] papers confirm the blood flow effects and show additional injuries. They are based on a study of 700 people with electro-sensitivity showing the subjects suffered from permeability of the blood-brain barrier, depressed melatonin levels, oxidative stress and aggravated auto-immune response. These effects were shown to be connected to RF exposure[61]. In CHD's case against the FCC, the court specifically mentioned that the FCC failed to respond to the evidence showing these effects.[62]

32. Those who want to propagate this technology have consistently generated perceived "controversy" as a method to deny Electro-sensitivity. They do so by funding negative subjective-perception provocation studies so they can claim that it is psychological or fear-induced (the "nocebo effect"). These studies suffer from numerous fatal design flaws.[63]

33. The most ironic design flaw in these studies is that they do not control for the nocebo effect, which is a prerequisite to the validity of any provocation

---

[59] https://emf-experts.news/wp-content/uploads/2020/09/Belpomme-EHSdiagnosis-Study2020.pdf.

[60] https://pubmed.ncbi.nlm.nih.gov/26613326/.

[61] https://bioinitiative.org/wp-content/uploads/pdfs/sec01_2012_summary_for_public.pdf#page=10; https://bioinitiative.org/table-of-contents/.

[62] *Envtl. Health Tr. v. FCC*, Nos. 20-1025, 20-1138, 2021 U.S. App. LEXIS 24138, at *12-*16 (D.C. Cir. Aug. 13, 2021).

[63] Many of those provocation studies were heavily funded by mobile phone carriers and led by James Rubin PhD, a psychologist (not EMF expert).

study. Then they conclude that the symptoms are likely a result of a nocebo effect.[64]

34. Another primary flaw in these studies is the illogical assumption that all people with Electro-sensitivity should be able to immediately "detect" when the RF signal is on/off. But those affected do not typically "sense" radiation. They develop symptoms that take time to appear and subside. There are many other flaws. Nevertheless, properly conducted studies without predetermined agenda show that some sufferers can detect the signal.[65]

35. Subjective-perception provocation studies are considered the worst science because they can be easily manipulated.[66] Industry uses these studies to produce the required results to divert attention from hundreds of high-quality peer-reviewed credible studies that do not depend on subjective-perception and confirm the symptoms people develop, the corresponding physiological injuries and established causal mechanisms.[67, 68]

---

[64] https://www.bmj.com/content/bmj/332/7546/886.full.pdf.

[65] For example, a large scale study by the Dutch government, known as the TNO study: https://childrenshealthdefense.org/wp-content/uploads/rf-electrosensitivity-provocation-tno.pdf.

[66] https://ecfsapi.fcc.gov/file/7520940903.pdf#page=25.

[67] https://childrenshealthdefense.org/rf-2018-Golomb-Diplomats-2/#page=9.

[68] https://childrenshealthdefense.org/rf-2014-electrosensitivity-dr-blythe/.

36. It is important to emphasize that while widely quoted and used to deny Electro- sensitivity, subjective-provocation studies are not used to diagnose any condition and are definitely "not suitable to disprove causality."[69] A person's inability to detect the pathogen that causes the reaction does not mean the individual is unaffected by the pathogen. "Human RF-detector" is not a mandatory symptom for Electro-sensitivity.

Smart Meters' Effects

37. Beyond individual predisposition, the appearance of adverse effects can depend on signal intensity, exposure duration; specific frequencies involved; exposure to multiple frequencies and sources which create high exposure variability; on-off pulsation and sharp "peaks and valleys."

38. Expert smart meter testing indicates there are three primary RF exposure issues.[70, 71, 72,73] First, the RF antennas within the meter send usage data and communicate with other meters and smart devices. They wirelessly emit

---

[69] https://childrenshealthdefense.org/wp-content/uploads/rf-2016-europaem-guidelines.pdf #page=11.

[70] https://childrenshealthdefense.org/wp-content/uploads/pa-amicus-sage-smart-meters.pdf.

[71] https://childrenshealthdefense.org/wp-content/uploads/rf-pa-amicus-engineer-expert-erik-anderson-report.pdf.

[72] https://childrenshealthdefense.org/wp-content/uploads/pa-amicus-isotrope.pdf.

[73] https://childrenshealthdefense.org/wp-content/uploads/pa-amicus-bathgate-pa-smart-meters.pdf.

intensely pulsed RF/EMF. Second, these antennas' RF emissions also conduct over the home electric wiring,[74] transforming the entire house into a "repeater" antenna.

39. Finally, the switch mode power supply (SMPS) creates RF frequencies as a byproduct of the AC/DC conversion process. The traditional analog meters used for decades do not have SMPS and do not create these emissions. SMPS-generated emissions are typically in the range of 2-150 KHz. They enter the house's electric wiring and then radiate RF in various parts of the house. Digital meters also use SMPS; therefore, they too create RF frequencies, even though they do not have transmitting RF antennas.

40. As noted, the FCC admitted there are neurological effects from non-thermal RF emissions[75] and its admission applies to frequencies in the kilohertz range created by the SMPS. The symptoms the FCC recites are similar to those reported by those who assert adverse effects from smart meters including tingling, shock, pain, or altered behavior due to excitation of tissue in the body's peripheral nervous system.[76] The FCC explained that the presence of these frequencies outside the body induce "internal electric fields" within the human body.

---

[74] https://childrenshealthdefense.org/wp-content/uploads/pa-amicus-isotrope.pdf.

[75] *Proposed Changes in the Commission's Rule Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communication Commission Radiofrequency Exposure Limits and Policies*, ¶¶122-124 & nn. 322-335, 34 FCC Rcd 11687, 11743-11745 (2019).

[76] FN. 328, p.58.

41. A single smart meter antenna can emit up to 190,000 short but intense RF pulses (bursts/spikes) each day to transmit the usage data to the utility. These bursts can be two and a half times above the FCC's limits, if you do not apply the 30-minute "averaging" used in the FCC testing. The D.C. Circuit questioned[77] this averaging and the FCC proposes to abandon it, at least in part.[78] Depending on how close the meter is to occupied space within a home, a smart meter can cause very high intensity RF/EMF exposures.

42. People in proximity to a smart meter are at risk of significantly high aggregate whole-body exposure to RF/EMF. This is especially true regarding people living near multiple meters mounted together in an apartment complex or those who have a utility collector meter installed on their home which relays RF signals of up to 5,000 homes.[79] The cumulative 24/7 exposure is never measured but undoubtedly harmful, at least to some.

43. Studies have consistently shown that the pulsing is a major element in the creation and/or aggravation of effects from RF exposure. It is possibly more

---

[77] *Envtl. Health Tr. v. FCC*, Nos. 20-1025, 20-1138, 2021 U.S. App. LEXIS 24138, at *12 (D.C. Cir. Aug. 13, 2021).

[78] *Proposed Changes in the Commission's Rule Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communication Commission Radiofrequency Exposure Limits and Policies*, ¶¶122-124 & nn. 322-335, 34 FCC Rcd 11687, 11743-11745 (2019).

[79] https://childrenshealthdefense.org/pa-amicus-sage-smart-meters/#page=3.

important than the radiation levels.[80] EMF-based medical treatments, for example, recognize the higher bio-active nature of pulsation; they purposefully pulse the signal to obtain a higher biological response.

44. The effects of continuous exposure and the on/off pulsation effects were shown in a 2011 study.[81] The study tested a physician with Electro-sensitivity. She developed temporal pain, headache, muscle twitching, and skipped heartbeats within 100 seconds after each signal exposure. The study showed that the symptoms appeared in response to the on-off pulsing of the signal rather than the presence of a continuous EMF field or its intensity. "EMF hypersensitivity can occur as a bona fide environmentally inducible neurological syndrome."

45. The energy emitted by the RF antennas and from the operation of the SMPS enters the wiring system through "high variability" spikes in various RF frequencies. This has an on/off effect on the body. Studies have shown that the body is especially sensitive to "high variability" emissions.[82]

---

[80] https://bioinitiative.org/wp-content/uploads/pdfs/sec15_2007_Modulation_Blackman.pdf; https://bioinitiative.org/wp-content/uploads/pdfs/sec15_2012_Evidence_Disruption_Modulation.pdf.

[81] https://www.stopumts.nl/pdf/McCarty%20Marino%202011%20EMF%20ES%20&%20neurological%20syndrome%20Int%20J%20Neurosci%20July.pdf.

[82] https://childrenshealthdefense.org/wp-content/uploads/rf-2015-Panagopoulos-variability-effects.pdf.

Conclusion

46. Anyone who claims smart meters cannot produce the symptoms described by the customers is ignorant of the FCC's recent admission. They either do not understand or are misrepresenting the science on biological and adverse effects from pulsed RF/EMF. Many have reported getting ill following the installation of these smart meters. Considering the way smart meters operate and the multitude of complex emissions they create, it is no wonder. Forcing these meters on people who have become affected by RF/EMF is unconscionable. Those with Electro-sensitivity and others who are affected by RF/EMF must be allowed to secure analog meters because it is the only type of meter that does not cause or worsen their condition.

Respectfully Submitted,

Scientists Statement Signatories

Professor David O. Carpenter, MD, Professor of Environmental Health Sciences, and Director, Institute for Health and the Environment at the University of Albany, a collaborating center for the World Health Organization (WHO). Dr. Carpenter is a Harvard trained public health expert who focuses on the study of environmental causes of human disease with expertise in electrophysiology, low-frequency electromagnetic field and radiofrequency (RF) radiation bioeffects. He was Chairman of the Neurobiology Department of

Armed Forces Radiobiology Research Institute at the Defense Nuclear Agency in Washington DC; the Director of Wadsworth Center for Laboratories and Research of the New York State Department of Health; and Executive Secretary of the NY State Power Line Project regarding health effects associated with exposure to EMFs. After the project concluded, he became spokesperson for NY state on all matters associated with EMFs. He is the Co-Editor of the BioInitiative: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields. Dr. Carpenter has authored more than 400 scientific papers.

Professor Igor Belyaev, DSc, Head, Department of Radiobiology; Cancer Research Institute, Biomedical Research Center, Slovak Republic. He has an MSc. Degree in Radiation Physics and Dosimetry; PhD in Radiobiology; and DSc. degree in Genetics. He was an Associate Professor of Toxicological Genetics at the Stockholm University, Sweden, as well as a senior research scientist and group leader in the departments of Radiobiology, Molecular Genome Research, Genetic and Cellular Toxicology, Genetics, Toxicology and Microbiology. He is now or formerly a member of: The Working Group of the International EMF Project of the World Health Organization; the Working Group for the evaluation of RF carcinogenicity of the International Agency on Research in Cancer (IARC); the Swedish National Committee for Radio-Science; the Russian National Committee on Non-Ionizing Radiation Protection; the EMF Working Group of the European Academy for Environmental Medicine (EUROPAEM). He serves as Associate Editor for the International Journal of Radiation Biology and on the Editorial Board of Electromagnetic Biology and Medicine. He published over 100 scientific papers and was awarded by the Bioelectromagnetics Society for the most influential

paper in Bioelectromagnetics 2006-2010. He is a member of the BioInitiative Working Group and authored the BioInitiative's 2012 Section on the effects of Pulsation and Modulation.

Professor Beatrice Golomb, MD, PhD, Professor of Medicine at the University of California, San Diego. She also leads a research group which focuses on the relation of oxidative stress and mitochondrial function to health, aging, behavior, illness, environmental and medication effects, nutrition, and bioenergetics. She served as a primary care doctor of veteran patients for over 15 years. She is known for her work on Gulf War Illness, statins and placebos and for her 2018 paper "*Diplomats' Mystery Illness and Pulsed Radiofrequency/Microwave Radiation*" which concludes, "Reported facts appear consistent with pulsed RF/MW as the source of injury in affected diplomats." She was invited to present to the National Academy of Sciences about these findings. She has published 136 scientific papers.

Professor Reba Goodman, PhD, Professor Emeritus in Clinical Pathology at Columbia University. Dr. Goodman received an MA and a PhD in Developmental Genetics from Columbia University. She has authored a great many studies, including at least 76 studies on effects of electromagnetic fields. Early on, in her paper in Science entitled "*Pulsed electromagnetic fields induce cellular transcription*," (1983), she showed how even weak, pulsing electromagnetic fields could modify biological processes.

Professor Lennart Hardell, MD, PhD, is a retired Professor of Oncology and Cancer Epidemiology, from Örebro University Hospital in Sweden. Dr. Hardell continues his work through his involvement with the Environment and Cancer Research Foundation. His research focus has been the environmental

risk factors for cancer. Prof. Hardell has been awarded several scientific prizes for his research. In recent decades his research focused on the effects of RFR exposure, especially on mobile phones and the risk of brain tumours. The research by the Hardell group influenced IARC's 2011 classification of radiofrequency radiation as a possible 2B carcinogen. Dr. Hardell was also a member of IARC's evaluating group. He has published more than 350 peer-reviewed scientific papers, including many on the biological effects of electromagnetic radiation.

Professor Paul Héroux, PhD, Director of the Occupational Health Program, Faculty of Medicine, McGill University, Canada. Dr. Heroux is a toxicologist with a PhD in Physics. He teaches courses at McGill University about the adverse health effects of EMFs. He has published 42 scientific papers, 27 of them on the effects of EMFs. He also authored several text books. His most recent paper is "*Adverse health effects of 5G mobile networking technology under real-life conditions*." (Toxicol. Let 2020). He is a member of the BioInitiative Working Group and was a member of the committee appointed by the New Hampshire legislature to review the effects of 5g and wireless technologies.

Professor Olle Johansson, PhD, retired associate professor at the Karolinska Institute, Department of Neuroscience, and head of The Experimental Dermatology Unit from the Karolinska Institute, and the Royal Institute of Technology, Stockholm, Sweden. He has published more than 800 papers, conference reports, book chapters, commentaries, and debate articles. His main focus was basic and applied neuroscience. Starting in 1977, his research focused on the adverse health and biological effects of man-made pulsed RF-

based wireless technologies. He has published more than 330 papers in that field, many with a focus on the effects on the skin.

Professor Anthony B. Miller, MD, CM, FRCP, FRCP(C), Professor Emeritus, Dalla Lana School of Public Health, University of Toronto. He was the Director, Epidemiology Unit, National Cancer Institute of Canada; Professor, and Chair of the Department of Preventive Medicine and Biostatistics, University of Toronto; Special Expert in the Division of Cancer Prevention, US National Cancer Institute; Senior Epidemiologist, International Agency for Research on Cancer; Head, Division of Epidemiology, German Cancer Research Centre; Associate Director Research, Dalla Lana School of Public Health, University of Toronto. In 2019 he was elected a Member of the Order of Canada for his work on Cancer Control. He has published 354 peer-reviewed papers. In the past few years he has focused on RF/EMF effects. He has published six papers on the topic of RF/EMF and has presented in many conferences on this issue.

Professor Martin Pall, PhD, Professor Emeritus of Biochemistry and Basic Medical Sciences at Washington State University. Dr. Pall is a published and widely cited scientist on the biological effects of electromagnetic fields and speaks internationally on this topic. His expertise includes how RF/EMF impacts the electrical systems in our bodies with a focus on the VGCC injury mechanism. He published seven papers showing that pulsed RF/EMF interferes with the operation of the voltage-gated calcium channel, a sensor that is responsible for the entry of calcium into our cells.

Alfonso Balmori, BSc, M.S.Ed, is a world renowned biologist, with a master in environmental education. He has published more than 50 scientific papers published in peer-reviewed journals on environment, ecology, and biodiversity conservation issues. He is known worldwide for his work on the effects of electromagnetic RF radiation on animals and plants, mainly on the effects of cell towers. His papers were quoted in the US Department of the Interior 2014 letter concluding that cell towers harm migratory birds and that the FCC guidelines are 30 years out of date. This letter was referenced by the Court in the Remand Guidelines decision.

Professor Kent Chamberlin, PhD, Past Chair and Professor Emeritus, Department of Electrical and Computer Engineering, University of New Hampshire. The focus of his research has been Computational Electromagnetics. He also investigated the interaction of electromagnetic fields and the human body, which resulted in seven publications. He was appointed by the Chancellor to the New Hampshire Commission to Study the Environmental and Health Effects of Evolving 5G Technology, which concluded that 5G and pulsed RF-based wireless technologies are harmful to health.

Dr. Priyanka Bandara, PhD, is a scientist with a PhD in Biochemistry and Molecular Genetics. She served as senior manager of a research team and a clinical team at Westmead Children's Hospital, Australia. She then became involved in environmental health and disease prevention. Her current focus is the impact of pulsed RF-based wireless technologies on health. Dr. Bandara has published 13 papers on the effects of electromagnetic radiation in international scientific journals, and has presented at major conferences and academic institutions. She serves as Associate Editor of the Journal of the Australasian

College of Nutritional and Environmental Medicine and as peer-reviewer for several international medical journals.

Dr. Frédéric Greco, MD, is a practitioner in the neuro-intensive care unit at the University Hospital of Montpellier, France, and teaches at the university's Faculty of Medicine. He is a member of the working group set up by the French government's health department to implement national recommendations for the medical care of electrosensitive people. He is the principal investigator of the ongoing clinical study "*Migraine in Electrohypersensitive Patients.*"

Dr. Yael Stein, ***MD,*** is head of the Electromagnetic Radiation Research Clinic at Hadassah Medical Center, Jerusalem, Israel, focusing on electro-sensitivity diagnosis and treatment. She is a certified Anesthesiologist at Hadassah Medical Center and researcher at the Hebrew University Medical School. She also specializes in Pain Medicine and is currently completing an MPH at the Hebrew University School of Public Health. She has extensive experience in research on the health effects of electromagnetic fields on humans from the epidemiologic and biological/medical points of view, and has worked in this field since 2007.

Cindy Sage, MA, is an environmental sciences consultant and researcher on electromagnetic fields and radiofrequency radiation. She is the founder of the international BioInitiative Working Group, and the co-editor of the BioInitiative Reports (2007 and 2012). Ms. Sage has provided expert testimony and scientific testimony on non-ionizing radiation to the Federal Communications Commission, the US Food and Drug Administration, the California Public Utility Commission, the European Commission's Directorate of Public Health - Scientific Committee on Emerging and Newly Identified Health Risks

(SCENIHR). She has advised numerous state and federal agencies on wireless health risks, smart meter emissions and safety limit inadequacies. She has published 24 peer-reviewed papers on the evidence of health risks from electromagnetic fields and radiofrequency radiation, and she studies the effects of smart meters.

Dr. Cindy Russell, MD, is a surgeon and Executive Director of Physicians for Safe Technology. Since 1995, she has been a member of the Santa Clara County Medical Association Environmental Health Committee. Dr. Russell has published several peer-reviewed papers on the impacts of wireless technology on human health and the environment with hundreds of scientific references. Her focus continues to be disease prevention and environmental health through toxics reduction.

Dr. Mary Redmayne, PhD, is a researcher, educator and consultant with Adjunct Research Fellowships at Victoria University of Wellington and at Monash University, Melbourne. Her research interests and experience include children's use of wireless devices and their effect on health and well-being. She has many peer-reviewed papers, with at least 22 on health and electromagnetic fields and RF radiation. She lectures on these issues both in New Zealand and internationally. Dr. Redmayne is a Participating Member of Standards Australia Committee on Human Exposure to Electromagnetic Fields, a technical committee responsible for standards settings. She is a scientific advisor for the Oceania Radiofrequency Scientific Advisory Association, and for the Building Biology and Ecology Institute, NZ.