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Mr. Mark D. Marini
Secretary, Department of Public Utilities
One South Station, 5th Floor
Boston, Massachusetts 02110

RE: Reply Comment from the Massachusetts Association for the Chemically Injured, Inc. to the Department of Public Utilities on D.P.U. 12-76 Investigation by the Department of Public Utilities on its own Motion into Modernization of the Electric Grid

Dear Secretary Marini:

On behalf of the members of the Massachusetts Association for the Chemically Injured (MACI), a volunteer, non-profit statewide support, education and referral organization for people with Multiple Chemical Sensitivity (MCS), I am providing a reply comment on D.P.U. 12-76. I provided written comments from our organization on D.P.U. 12-76-A in January with two attachments and as the President of the Massachusetts Association for the Chemically Injured, I participated on the health and safety hearing panel February 27, 2014 offering oral comment. These comments are already part of the record. At the hearing I submitted a number of documents as part of our organization's comment for the record. At the panel hearing I stated that I deal with real life experience, as a chemically sensitive individual myself and in my role in talking with our members and with the many people who contact our organization. It remains our position in this reply comment that the Massachusetts Association for the Chemically Injured strongly opposes a grid modernization plan based on wireless technology.

The EMR Policy Institute has given extensive testimony on D.P.U. 12-76 regarding the many inadequacies of the FCC RF safety limits and on the science and how this applies to the matter before this agency. They provided written comment, gave oral testimony before the DPU's panel hearing and submitted extensive documents into the record. MACI concurs with the EMR Policy Institute's position. We commend their strong leadership role in providing testimony and sound scientific information and documents to aid decision makers in setting policy decisions. We request that the DPU give their comments on docket 12-76 strong consideration. The EMR Policy Institute has joined the many physicians, scientists, local governments, groups and trade organizations

that filed comments with the FCC "urging much more restrictive safety limits on radiofrequency radiation (RF) exposures so that humans are actually protected from electromagnetic radiation that harms their health." (19)

Many people who suffer from multiple chemical sensitivities are concomitantly vulnerable to the effects of EMFs and radiofrequency (RFR). The combination of sensitivities is quite disabling and puts their ability to work or live in their residences at greater risk and significantly affects their quality of life. The population survey of hypersensitivity to electromagnetic fields in CA found chemical sensitivity to be an important risk factor for hypersensitivity to EMFs. Given the prevalence of chemical sensitivity documented in several population surveys that indicate while MCS appears to afflict 4 to 6 percent of the population, 15 to 30 percent of the general population perceive themselves as "especially" or "unusually" sensitive to common everyday chemicals in the population with the expanded use of smart meters, this issue will continue to grow for MCS sufferers. Also, it has been found that many people without prior sensitivity developed sensitivity to EMFs/RF following the installation of smart meters (1, 6 ,7)

During the panel hearing the evidence for electromagnetic hypersensitivity was discussed. MACI offered comment that our organization is contacted by individuals impacted by health related effects from exposure to wireless devices and technologies, and more recently, to smart meters. Several panel members including a health care practitioner, a physician, a citizen advocate from HaltMAsmartmeters.org. and myself provided comment on the life experiences of clients, patients, and individuals experiencing health effects and symptoms related to EMF/RF exposure (Thea Fournia, Dr. Lisa Nagy, and Clare Donegan). On the other hand, Dr.Peter Valberg addressed these concerns with a statement about a PubMed database search of results of studies for individuals who are perceived to be electrosensitive generally show they cannot detect the presence of these fields. He followed with…"it seems like time and time again the actual experiments to try to elicit the response in the laboratory have failed." However, basing testimony on study summaries without fully evaluating the worth of any study cited including the source of the funding for the study, the design of the study, methodologies used and potential flaws is a flawed approach to providing testimony. Dr. Rea in his submitted comment to the D.P.U. gave both his clinical experience and his research experience on EMF challenge testing at the Environmental Health Center in Dallas: "In most patients, a consistent sensitivity to certain specific frequencies can be found and quantified through objective measures of the activity of the autonomic nervous system." (20. p.4) This challenge testing is based on a technique that was developed on his 1991 double blind study of electromagnetic and radiofrequency waves in the 30Mhz to 300GHz range (RF) and their potential effects on humans. (20, p4, 21)

I offered a response at the hearing and will reiterate it here that in the experience of our organization from MACI members and the public, that one needs to look at more than an abstract or the conclusion statement offered on results of studies in this area to draw a valid conclusion. I have followed the literature on chemical sensitivity for over 23 years, reviewing the literature offered from two state-sponsored Reports on chemical sensitivity (Ashford and Miller 1989, 1991; Bascom 1989 - New Jersey and Maryland) and that from 3 national

workshops/conferences (Ashford and Miller 1998 Chapter 7 Recent Developments: NRC 1992, AOEC 1992, ATSDR 1994) and a specific workshop addressing research design (Experimental Approaches to Chemical Sensitivity; Environmental Health Perspectives Supplements, Volume 105, Supplement 2, March 1997) in the 1990's. Drs. Ashford and Miller are the authors of the New Jersey study and have been involved as researchers and experts at these conferences and published a highly regarded book Chemical Exposures: Low Levels, High Stakes, which is still considered *the* textbook on chemical sensitivity. In their book Chapter 8, Key Research Findings since the First Edition, they address the issue of Exposure Challenge Studies. Their review of studies, the flaws, and what is needed to answer important questions in the area of low level chemical exposure has relevance for researchers and scientists who would investigate and attempt to conduct studies on low level exposure to EMFs/RF and the resulting symptoms described by individuals expressing electromagnetic hypersensitivity. On page 218 the authors stated that since the first edition ***"few controlled studies and no adequately designed studies involving provocative challenges have been conducted***..."(2, p. 218) The authors gave examples of studies that report false negative and false positive results if not properly designed. The authors summarized some of the major flaws: "To date, few exposure studies involving MCS patients have been conducted. Flaws in these studies as described above include: failure to ensure that patients are at baseline (unmasked) prior to challenge; failure to demonstrate that relevant active challenge substances at relevant concentrations are used; failure to demonstrate that masking agents, filter media, and/or other incidental exposures do not provoke symptoms; failure to consider effects of spacing challenges too closely together (causing acclimation or habituation); referral biases affecting the makeup of the study population; and failure to provide essential methodologic details in papers." (2, p. 222)

Dr. Nagy's comment on psychological symptoms: "some of us will look manic or hypomanic or anxious or whatever you want to call it, and some don't. But nevertheless, they're not psych patients; they're environmentally ill with psychiatric features which improve with treatment." Drs. Ashford and Miller expound on this issue and they stated:... "Davidoff and Fogarty (1994) pointed out the frequently overlooked fact that psychological symptoms are not necessarily psychogenic: 'According to the consensus within the American Psychiatric Association, psychiatric diagnoses are descriptive entities that subsume signs and symptoms without explaining them. In other words, psychiatric symptoms and diagnoses are "nonspecific" in terms of etiology; these phenomena may have diverse causes.'" (2, p. 255) Ashford and Miller also state "The papers published since the first edition of this book that purport to "prove" psychological causes either simply document psychological symptoms (which are not necessarily psychogenic) in some, but not all, MCS patients (Simon et al. 1990, 1993), make unsupported claims concerning the efficacy of psychological interventions (Staudenmayer et al. 1993b) ...or are, for the most part, recycled opinion (Staudenmayer 1996, 1997; Gots 1995;1996)." (2, p.281)

The literature looking at exposure studies and symptoms reported due to EMF/RF exposure do indicate mixed results. However, negative study results do not negate the studies that have found positive responses to EMF/RF exposure. An unbiased reviewer giving expert

testimony should examine the design of the study and any limitations that may have been a factor in studies of such a complex nature. The review noted in the Public Utility Commission of Texas Report did not adequately or fairly address the literature on EHS and presented incomplete as well as biased conclusions regarding provocation studies.

The *Bioinitiative Report*, on the other hand, looked at all of the literature and did find that there was evidence in the scientific literature for electrohypersensitivity: "What is evident is that a growing number of people world-wide have serious and debilitating symptoms that key to various types of EMF and RFR exposure. Of this there is little doubt."(4) MACI referenced the *Bioinitiative Report* and included quotes from this Report in our prior written comment and in the oral comment and submitted into the record at the panel hearing the *Bioinitiative Report* Sections pertaining to evidence for electrohypersensitivity as well as two of the more recent exposure studies showing biological responses to EMF/RF exposure.(4, 11, 15)

The document by Attorney Frank Mead for the Arizona Safer Utilities Network: "Comments on the Public Utility Commission of Texas Report" was submitted by MACI at the hearing and needs to be reviewed regarding rebuttal on the EHS issue and on the PUC of Texas Report in general.(16) The MA D.P.U. offered the PUC Texas Report as one of three published reports in their drawing a conclusion of "unlikely to harm health". The peer-reviewed Genuis Review: "Electromagnetic hypersensitivity: Fact or fiction?" submitted by MACI at the hearing gave background information and historical milestones related to EHS and in 6.1 Response to challenges relating to the EHS diagnosis *explanatory points* were addressed under the designated headings:

- Lack of Clinical Response to EMR in some Research
- Fluctuating Clinical Responses to EMR in some Research
- Delayed Clinical Response to EMR in some Research
- Differing Clinical Outcomes in Different Individuals
- Psychogenic Etiology
- Lack of Objective Evidence
- EHS Defies Experience and Doesn't Make Sense
- Conflict of Interest Issues
- Historical Precedent
- Knowledge Translation. (9, p.110)

In addition to the first hand life experiences of the panel members, the epidemiological studies that look at prevalence of chemical sensitivity and EHS in the population and the individual studies reported in the scientific literature documenting health effects to EMFs/RF several questionnaire surveys have been conducted and reported on regarding smart meters and health effects. Observations, by the individual and/or by physicians, scientists and researchers are part of the scientific process and can assist with recognition and advancing an issue. The use of questionnaire surveys with data collection is very useful in documenting and gathering information in the scientific process.

Dr. Karl Maret whose comment to the CCST was submitted into the DPU docket record was a presenter at the National Institute for Science, Law & Public Policy interdisciplinary program "The High Road to a True Smart Grid" at the Commonwealth Club, January 28, 2014. The title of his presentation was "EMF Health Concerns associated with RF Metering in California's Smart Grid". You may view his full presentation and download the pdf of his slides.
(http://gettingsmarteraboutthesmartgrid.org/the_high_road_to_a_true_smart_grid_video). Dr. Maret cites data from the EMF Safety Network questionnaire survey "Wireless Utility Safety Impacts Survey". The stated objectives of the survey "were to investigate reported public health and safety complaints about wireless utility meters; to evaluate the impacts on health and safety due to wireless utility meters and to determine whether further study is warranted."(10) In answer to the question "Are you, or is a member of your household, EMF sensitive? (EMF sensitivity is also called electrical sensitivity, or electrohypersensitivity) 439 respondents answered Yes 48.7%=214, No 11.2%=49, I don't know 40.1%=176. (10) One slide in Dr. Maret's presentation shows the top 5 health issues the respondents identified- new or worsened symptoms - after smart meters were installed

- Sleep Issues= 49%
- Stress, anxiety, irritability = 43%
- Headaches=40%
- Ringing in Ears= 38%
- Heart Problems/palpitations=26%. (14)

(The full study can be found through a link within the intro to the survey at http://emfsafetynetwork.org/surevy-results-wireless-meters-impact-health-and-safety/)

Another survey, "SMART METER HEALTH EFFECTS SURVEY" was written by Richard Conrad, Ph.D. (conradbiologic.com) and Ed. Friedman (Maine Coalition to Stop Smart Meters) and was submitted in testimony as Exhibit D, Pre-Filed Testimony of Richard Conrad, Ph.D.; MPUC Docket No. 2011-00262. In testimony Dr. Conrad's response to the question What is the purpose of the Smart Meter Health Effects Survey? is: "The purpose was to develop reliable data much more solid than ordinary anecdotal evidence, about possible smart meter health effects, and their time-line (development of symptoms in relation to installation of smart meter in relation to knowledge of meter's presence)." "The survey was designed to discover if the health effects/symptoms that many persons have been attributing to smart meter exposures were really caused by those exposures or not." Two of the key questions to be answered were: "1. do smart meters initiate electrical sensitivities in previously normal persons, and 2. do smart meters worsen the electrical sensitivities in persons who were already electrically sensitive."(6, p.8) In response to What are the conclusions of the SmartMeter Health Effects Survey? Dr. Conrad responded: "The survey results provide very strong evidence that smart meters are causing painful and debilitating new symptoms in many previously normal healthy people, and causing them to become electrically sensitive to a whole range of electronic devices including Wi-Fi, cell phones and computers. Because of exposure to smart meters, people are becoming electrically sensitive at an unprecedented rate. Many of these people had previously lived with Wi-Fi in their homes on 24/7, worked in offices with Wi-Fi and many computers all

day long, and had used cell phones, all without symptoms. This includes professionals from all walks of life: doctors, dentists, nurses, teachers, realtors, salesmen and many who absolutely needed their computers for their work and had loved electronic devices: computer programmers, electronic engineers, accountants and graphic artists." (6, p.10) Dr. Conrad further testified "the study results show that in:

1. 210 survey respondents,
2. the majority well-educated (9 PhDs, 1 MD, 1 DDS, 42 MS or MA, 70 BS or BA),
3. many initially healthy and normal, without sensitivities, using WiFi, computers and cell phones without symptoms,
4. many had no prior knowledge of electrical sensitivities and had not cared one way or another about smart meters,
5. all began to develop painful symptoms very typical of electrical sensitivities (including loud tinnitus, heart palpations or arrhythmias, burning skin, severe headaches, neuropathies, difficulty concentrating, sleep problems and more) soon after their smart meters were installed,
6. where 42% of them were not even aware that a smart meter had been installed on their home until after they developed symptoms (a double-blind "experiment"), and 16% did not develop symptoms until weeks or months later (if they were going to have psychosomatic symptoms, these would have developed in minutes, hours or days, not 2 weeks or months), and
7. when they were able to have the smart meters removed, their symptoms lessened usually immediately, sometimes completely, and usually leaving them with electrical sensitivities where they no longer can use their electronic office equipment at all, or only for very short periods of time." (6, pp.12-13)

In addition to the chemically and electrically sensitive subgroup of the population who are most vulnerable to the biological effects of EMS/RF exposure, the D.P.U. must also consider the other segments of the population who are among those most vulnerable to the health effects of such exposures and noted in the scientific literature. The Sage Associates Report *Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters* summarized that "People who are afforded special protection under the federal Americans with Disabilities Act are not sufficiently acknowledged or protected. People who have medical and or metal implants or other conditions rendering them vulnerable to health risks at lower levels than FCC RF limits may be particularly at risk. This holds true for other subgroups like children and people who are ill or taking medication, or are elderly, for they have different reactions to pulsed RF…The elderly and those on some medications respond more acutely to some RF exposures." (10 p. 8)

I also offered comment at the panel hearing about "toxicology" and what we are discovering in science and medicine today from a published article by Drs. Ashford and Miller titled: "Low-Level Chemical Exposures: A Challenge for Science and Policy". (3) This prophetic commentary has familiar notes of exposures linked to adverse biological effects put forth in the *Bioinitiative Report* only the article was published, nine and fourteen years, respectively, before the two *Bioinitiative Reports*. This article also speaks to the testimony Janet Newton offered at the hearing on Late Lessons and Early Warnings published in *Pathophysiology* by

David Gee. (8) Some of Drs. Ashford and Miller's points were:

- "Once thought to be safe, there is mounting evidence that human exposure to chemicals at low levels can be harmful. The exposures are linked with adverse biological effects, including endocrine disruption (1), chemical sensitivity (2), and cancer (3).
- We are just beginning to recognize the link between chemicals and new public health problems that challenge the tenets of traditional toxicology and medicine.
- We must therefore consider adoption of the Precautionary Principal (acting preventively in the face of uncertainty), erring on the side of caution.
- Often, early warnings warranted heeding. Predictions were in the right direction, if not understated. Unfortunately, although precautionary actions were justified, too much time elapsed before they were implemented, and harm occurred.
- Potentially harmful chemicals should be regulated when scientific evidence, although imperfect, is compelling." (3)

With an additional 1800 studies referenced in the *BioInitiative Report 2012* the evidence mounts for a vast array of possible health effects resulting from chronic exposures to extremely low frequency (ELF) and/or radiofrequency radiation (RFR). Findings most pertinent to people living with MCS indicate that "EMF acts on the body like other environmental toxicants do (heavy metals, organic chemicals and pesticides). Both toxic chemicals and EMF may generate free radicals, produce stress proteins and cause indirect damage to DNA. Where there is combined exposure the damages may add or even synergistically interact, and result in worse damage to genes." (4, Conclusions Table 1-1, EMF and RFR Make Chemical Toxins More Harmful). For those with MCS already adversely affected by toxic environmental exposures there is the possibility of *increased* risk of a number of cancers (breast and leukemia amongst them), neurodegenerative diseases, "altered immune function including increased allergic and inflammatory responses, miscarriage and some cardiovascular effects. Insomnia (sleep disruption) is reported in studies of people living in very low-intensity RFR environments with WI-FI and cell tower-level exposures. Short-term effects on cognition, memory and learning, behavior, reaction time, attention and concentration, and altered brainwave activity (altered EEG) are also reported in the scientific literature." (4: Editors Notes, "Do We Know Enough to Take Action?") Many of these are health effects the MCS sufferers experience on a daily basis. Studies on RFR exposures indicate these symptoms could be exacerbated or escalate to a disease state such as cancer requiring treatment that the MCS sufferer may not tolerate well due to hypersensitivity to chemicals.

In the "Guest Editorial: WHO recognizes electromagnetic dangers: let us declare human health rights," Sage and Huttunen stated: "It is well documented that RFR exposures in daily life alter homeostasis (homeodynamics) in human beings. ... In every society the basic rights of citizens must be safeguarded. Adoption of a Human Health Rights Declaration is necessary to protect all life and our living environment from harmful exposures that have run out of control and ahead of the scientific warnings." (24, pp.1-2) Another slide from

Dr. Maret's presentation previously mentioned was based on the 2008 Review Article by Stephen J. Genuis "Fielding a current idea: exploring the public health impact of electromagnetic radiation". The slide read:

- 2008 review article surveying 112 peer reviewed studies
- Concludes that there is strong epidemiological evidence of considerable potential for injury and affliction as a result of non-ionizing radiation exposure from EMFs.
- Evidence for reproductive dysfunction, cancer and CNS dysfunction
- Describes industrial vested interests that biased scientific research, promote doubt and uncertainty to minimize potential harm of EMFs (14)

Regarding the Bench question on research, studies and public health agencies a number of panel members contributed information. Janet Newton addressed studies and replication of studies and the need to read the whole study and did the study follow the same protocol. Several spoke about funding issues and lack of funds for US studies and most of the studies are not done in the US. Dr Nagy contributed information on funding of studies especially on issues that have been termed "controversial" and the difficulty in competing for limited funding. The last point in Dr. Maret's slide above concurs with the vested industry input and funds in creating the picture of "doubt" or "controversy".

A few public health agencies have been asked to weigh in on the issue. Clare spoke about the inadequate report that the Worcester Department of Health produced with the use of a selective study and a selective conclusion. A report by Poki Stewart Namkung, M.D., MPH, the Health Officer for the County of Santa Cruz, weighed in on the Health Risks associated with smart meters and concluded:

> "In summary, there is no scientific data to determine if there is a safe RF exposure level regarding its non-thermal effects. The question for governmental agencies is that given the uncertainty of safety, the evidence of existing and potential harm, should we err on the side of safety and take the precautionary avoidance measures? The two unique features of SmartMeter exposure are: 1) universal exposure thus far because of mandatory installation ensuring that virtually every household is exposed; 2) involuntary exposure whether one has a SmartMeter on their home or not due to the already ubiquitous saturation of installation in Santa Cruz County. Governmental agencies for protecting public health and safety should be much more vigilant towards involuntary environmental exposures because governmental agencies are the only defense against such involuntary exposure." (17, p.5)

The EMR Policy Institute submitted into the DPU 12-76 record their "Open Letter to Dr. Harry Chen MD, Commissioner of the Vermont Department of Health on the deficiencies in the Vermont Department of Health's February 10, 2012 Smart Meter Report and requests that VDH revise its findings. During the panel hearing Dr. Valberg suggested that perhaps the DPU should look at the study that the Department of Public Services in Vermont did. The EMR Policy Institute's letter points out flaws in the data collection in the study. (18)

David Carpenter, MD, a public health physician submitted comment on DPU 12-76. The D.P.U. should review the peer review article "Public health implications of wireless technologies" by Cindy Sage and David Carpenter (23) Thea Fournia submitted a list of doctors or scientists calling for stricter regulation or a moratorium on the wireless technology. In our organization's earlier January comment we quoted from Section 24 of the *BioInitiative Report* "Key Scientific Evidence and Public Health Policy Recommendations" and I feel it warrants repeating here:

> "There is better understanding of the important physical and biological factors that make ELF-EMF and RFR potent disruptors of living tissues and basic metabolic processes. … The exposure levels causing effects are documented to be much lower than in the past. The epidemiological evidence is now showing risks for a variety of adverse health outcomes. All this should be taken seriously by governments, and translated quickly into more protective safety standards, and in the interim, into strong preventative actions, warnings and substitution of safer technologies and redesigned devices. …This is not a weak or reckless judgment made with few facts. It should be a strong warning to governments to reconsider their safety standards, particularly in light of the billions of people at potential risk from new wireless technologies." (4)

Written comments and documents offered before the D.P.U. by members of the public, organizations, scientists, physicians and physician groups have repeatedly mentioned the need to adopt the Precautionary Principle and a preventative approach to moving forward with a grid modernization plan. At the panel hearing on health and safety five of the six panel members addressed the need for the D.P.U. to heed the growing body of scientific literature in setting policy. Dr.Valberg's position on non-ionizing radiation was centered on the thermal effects – "the only kind of interaction it can have with matter is heating it, and it can heat it to various degrees." This position plays well for industry and industry groups. The D.P.U. has been given a great deal of information on the growing body of science looking at non-thermal biological effects with health consequences for human beings which challenges this old dogma. New guidelines on radiofrequency radiation exposures are needed for what we are exposed to today and decisions that have wide public health implications must be based on today's science. In the face of uncertainty our decision makers on issues that will have such a large public heath impact must take a precautionary approach in their setting of policy.

While an opt-out provision is vital, it is only a partial solution because radiation does cross property boundaries. Any mandate of a smart meter installation plan is a mandate for involuntary exposure to wireless technology. The disabled should have the right to protect their health and safety fairly and without monthly fees. As such, any proposed monthly fees/tariff would violate the special protections under ADA. The disabled who are afforded special protection under the federal Americans with Disabilities Act are not acknowledged or protected in the D.P.U.'s plan.

I believe the D.P.U. received a listing from the EMR Policy Institute of possible experts and scientists that the D.P.U. could contact and it was also mentioned at the panel hearing that many of the scientists such as Dr. Martin Blank, Dr. Magda Havas, Dr. De-Kun Li could be contacted. Some of the experts in the field such as Dr. Carpenter submitted comment on DPU 12-76 and could be contacted for a more in-depth expert opinion report. Given the time devoted in the working group and developing the straw proposal for the Commonwealth's plan of grid modernization, a three hour panel hearing on the health and safety issue is not sufficient time to address this very important issue for the residents of Massachusetts.

It is imperative that the D.P.U. as the regulatory agency and a decision maker in setting policy for the Commonwealth of Massachusetts base decisions and direction on the best science and on the most current body of the evidence. The D.P.U. must put a grid modernization program forward that is not just the easiest one available, but the one that is the safest for the general population.

The Massachusetts Association for the Chemically Injured requests that the DPU:

- Place on hold (a moratorium) the rollout of "smart meters" and wireless network infrastructures which are specific to serve smart meter technology needs,
- Investigate safer technologies and,
- Require implementation of safer technology approaches which are available in a grid modernization plan for the Commonwealth of Massachusetts

Respectfully submitted,
Jean A. Lemieux
President

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