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

RE:

Petition of NSTAR Electric Company d/b/a Eversource Energy for approval of its Phase II Electric Vehicle Infrastructure Program and Electric Vehicle Demand Charge Alternative Proposal	**D.P.U. 21-90**
Petition of Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid, for approval of its Phase III Electric Vehicle Market Development Program and Electric Vehicle Demand Charge Alternative Proposal.	**D.P.U 21-91**
Petition of Fitchburg Gas and Electric Light Company d/b/a Unitil for approval of its Electric Vehicle Infrastructure Program, Electric Vehicle Demand Charge Alternative Proposal, and Residential Electric Vehicle Time-of-Use Rate Proposal.	**D.P.U. 21-92**

Dear Secretary Marini:

All of the proposals from the above-captioned utility plans sound wonderful if one believes electric vehicles (EV) are the route to preventing climate disaster. However, sound environmental and public health reasons exist to stall these proposals for modification or elimination, in addition for privacy and property protection.

PROPOSED ELECTRIC VEHICLE (EV) INFRASTRUCTURE

The following, with some slight variation, describes utility proposals, which are based upon published directives for electric vehicle infrastructure in D.P.U. 20-69-A, and the rate structure for demand charges regulated by Section 29 of Chapter 383 of the Acts of 2020 (the 'Transportation Act"):

1. Financial support to provide:
   a) In public sites and workplaces, Electric Vehicle Supply Equipment (EVSE) installations, for Level 2 (L2) chargers;
   b) Direct Current Fast Charging (DCFC) in environmental justice communities or in public sites and workplaces;

c) In properties with 1-4 units and multi-unit dwellings, EVSE and at-home charging enabling;]
d) EVSE installations in light duty fleet, including school buses;

2. Pilots to support electric fleet conversion in 'environmental justice' communities;
3. Workforce development and electrician training;
4. Demand charge alternative rate structure with a sliding scale, in accordance with the Transportation Act.

RADIOFREQUENCY GUIDELINES LACK AUTHORITY

Of great import, in *Environmental Health Trust v. Federal Communications Commission,* No. 20-1025 (D.C, Cir. 2021) the court held that the FCC failed to provide a reasoned explanation for deciding its radiofrequency guidelines are safe. This decision, unusual in chastising the FCC's inquiry decision, upends any claim of safety and reliance upon FCC guidelines, and now the FCC must again review and reconsider its guidelines.

Given this court decision, the Commonwealth, department, and utilities should stall investments into EV and EV infrastructure, in addition to the smart grid, in order to limit radiofrequencies.

EVALUATE & LIMIT RADIOFREQUENCY EXPOSURES

Secondly, the scientific evidence that these exposures are harmful should be seriously evaluated, and appropriate action taken to limit exposures from existing infrastructure.

Relevant health studies can be found on the Aachen University EMF Portal or at PubMed, and in addition experts independent of industry can assist with review and considerations such as

safer options.[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] The International EMF Scientist Appeal is a good starting point for identifying and contacting credible scientists and public health doctors independent of industry, while the Institute of Building Biology is another for identifying engineers and building biology consultants who have studied remediation.

While utilities and the department can adopt the ALARA principle, 'As Low As Reasonably Achievable', radiofrequency exposures from EV infrastructure and EVs, including electric fleets, require time and study for remediation and appropriate investment.[11] [12] Hence, EV infrastructure should be delayed.

If utilities and the department proceed with electric cars and corresponding infrastructure, then powering these cars must be planned carefully. Utilities and the department can take steps to limit transients, harmonics, etc., on the power lines from EV, in addition to heavy loads that create strong fields, as well as wireless signals. Technical problems, such as ground current, ground faults, and fire hazards, which also need to be addressed, are discussed by Ken Gartner in his testimony to these dockets – he also suggests a permitting process for all EV chargers.

---

1 Ozen S (2008 Jan) Low-Frequency Transient Electric and Magnetic Fields Coupling to Child Body. Radiation Protection Dosimetry. Oxford University Press. 128(1):62-63

2 Milham S. Evidence that dirty electricity is causing the worldwide epidemics of obesity and diabetes. Electromagn Biol Med. 2014 Jan;33(1):75-8. doi: 10.3109/15368378.2013.783853. Epub 2013 Jun 19. PMID: 23781992.

3 Neudorfer C, Chow CT, Boutet A, Loh A, Germann J, Elias GJ, Hutchison WD, Lozano AM. Kilohertz-frequency stimulation of the nervous system: A review of underlying mechanisms. Brain Stimul. 2021 May-Jun;14(3):513-530. doi: 10.1016/j.brs.2021.03.008. Epub 2021 Mar

4 Elferchichi M, Mercier J, Ammari M, Belguith H, Abdelmelek H, Sakly M, Lambert K. Subacute static magnetic field exposure in rat induces a pseudoanemia status with increase in MCT4 and Glut4 proteins in glycolytic muscle. Environ Sci Pollut Res Int. 2016 Jan;23(2):1265-73. doi: 10.1007/s11356-015-5336-3. Epub 2015 Sep 10. PMID: 26358208

5 Tenforde TS. Biological interactions and potential health effects of extremely-low-frequency magnetic fields from power lines and other common sources. Annu Rev Public Health. 1992;13:173-96. doi: 10.1146/annurev.pu.13.050192.001133. PMID: 1599584.

6 Drzewiecka EM, Kozlowska W, Zmijewska A, Wydorski PJ, Franczak A. Electromagnetic Field (EMF) Radiation Alters Estrogen Release from the Pig Myometrium during the Peri-Implantation Period. Int J Mol Sci. 2021 Mar 13;22(6):2920. doi: 10.3390/ijms22062920. PMID: 33805726; PMCID: PMC7999543.

7 Kiray A, Tayefi H, Kiray M, Bagriyanik HA, Pekcetin C, Ergur BU, Ozogul C. The effects of exposure to electromagnetic field on rat myocardium. Toxicol Ind Health. 2013 Jun;29(5):418-25. doi: 10.1177/0748233711434957. Epub 2012 Feb 9. PMID: 22323476.

8 Chung YH, Lee YJ, Lee HS, Chung SJ, Lim CH, Oh KW, Sohn UD, Park ES, Jeong JH. Extremely low frequency magnetic field modulates the level of neurotransmitters. Korean J Physiol Pharmacol. 2015 Jan;19(1):15-20. doi: 10.4196/kjpp.2015.19.1.15. Epub 2014 Dec 31. PMID: 25605992; PMCID: PMC4297757

9 Huss A, Peters S, Vermeulen R. Occupational exposure to extremely low-frequency magnetic fields and the risk of ALS: A systematic review and meta-analysis. Bioelectromagnetics. 2018 Feb;39(2):156-163. doi: 10.1002/bem.22104. Epub 2018 Jan 19. PMID: 29350413.

10 Belyaev I, Dean A, Eger H, Hubmann G, Jandrisovits R, Kern M, Kundi M, Moshammer H, Lercher P, Müller K, Oberfeld G, Ohnsorge P, Pelzmann P, Scheingraber C, Thill R. EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses. Rev Environ Health. 2016 Sep 1;31(3):363-97. doi: 10.1515/reveh-2016-0011. PMID: 27454111.

11 Yang L, Lu M, Lin J, Li C, Zhang C, Lai Z, Wu T. Long-Term Monitoring of Extremely Low Frequency Magnetic Fields in Electric Vehicles. Int J Environ Res Public Health. 2019 Oct 7;16(19):3765. doi: 10.3390/ijerph16193765. PMID: 31591344; PMCID: PMC6801816.

12 Niu D, Zhu F, Qiu R, Niu Q. Exposure to electromagnetic fields aboard high-speed electric multiple unit trains. J Biol Regul Homeost Agents. 2016 Jul-Sep;30(3):727-731. PMID: 27655489

As a matter of transparency and accountability, utilities should provide public information on existing radiofrequency exposures, including power quality, as well as utility remediation efforts and potential hazards.

HEALTH IMPACTS OF EV INFRASTRUCTURE

Poor power quality results when electrical lines carry extra frequencies ranging from less than 5 kHz to more than 500 kHz. **Poor power quality may cause calcium to be deposited in the heart, thereby damaging the heart, or may cause other health issues.**[13] [14] [15] [16] [17] [18] [19] EVs and EV infrastructure will compromise the power quality of electrical lines in areas serviced, including in targeted environmental justice communities, workplaces, and multi-unit dwellings.

A recent study discusses how **Direct Current Fast Chargers will cause enormous power quality problems,** but recommends a solution.[20] How much of a solution is this and is this tenable?

Another recent study found that **magnetic fields are often dangerously high near Direct Current Fast Chargers**.[21] If installed in **environmental justice communities** as planned, how is this an environmental justice? **If these are installed near parks, where children rest and play, or adjacent to a bedroom how will the hazards be eliminated?**

---

13 Markovskaya IV. The effect of low frequency electromagnetic radiation on the morphology of dental and periodontal tissues (experimental investigation). Wiad Lek. 2019;72(5 cz 1):773-778. PMID: 31175771.

14 Kumari K, Koivisto H, Viluksela M, Paldanius KMA, Marttinen M, Hiltunen M, Naarala J, Tanila H, Juutilainen J. Behavioral testing of mice exposed to intermediate frequency magnetic fields indicates mild memory impairment. PLoS One. 2017 Dec 4;12(12):e0188880. doi: 10.1371/journal.pone.0188880. PMID: 29206232; PMCID: PMC5714647.

15 Samuel Milham (2012 Dec 6) Dirty Electricity: Electrification and the Diseases of Civilization. Second Edition. iUniverse; 11.6.2012 edition

16 Brech A, Kubinyi G, Németh Z, Bakos J, Fiocchi S, Thuróczy G. Genotoxic effects of intermediate frequency magnetic fields on blood leukocytes in vitro. Mutat Res. 2019 Sep;845:403060. doi: 10.1016/j.mrgentox.2019.05.016. Epub 2019 May 30. PMID: 31561904.

17 Shuvy M, Abedat S, Beeri R, Valitzki M, Stein Y, Meir K, Lotan C. Electromagnetic fields promote severe and unique vascular calcification in an animal model of ectopic calcification. Exp Toxicol Pathol. 2014 Sep;66(7):345-50. doi: 10.1016/j.etp.2014.05.001. Epub 2014 May 29. PMID: 24882371.

18 Plaintiff opening brief for *Environmental Health Trust v. Federal Communications Commission*, No. 20-1025 (D.C, Cir. 2021) discuss how modulation, pulsation, and peak exposures appear most important to bioactivity, which relates to power quality – the brief also neatly summarizes health effects noted from RF and EMF science that had been submitted to the dockets in question.

19 Yadegari-Dehkordi S, Sadeghi HR, Attaran-Kakhki N, Shokouhi M, Sazgarnia A. Silver nanoparticles increase cytotoxicity induced by intermediate frequency low voltages. Electromagn Biol Med. 2015;34(4):317-21. doi: 10.3109/15368378.2014.919590. Epub 2014 Jun 5. PMID: 24901460.

20 Milanés-Montero MI, Gallardo-Lozano J, Romero-Cadaval E, González-Romera E. Hall-effect based semi-fast AC on-board charging equipment for electric vehicles. Sensors (Basel). 2011;11(10):9313-26. doi: 10.3390/s111009313. Epub 2011 Sep 28. PMID: 22163697; PMCID: PMC3231284.

21 Trentadue G, Pinto R, Salvetti M, Zanni M, Pliakostathis K, Scholz H, Martini G. Assessment of Low-Frequency Magnetic Fields Emitted by DC Fast Charging Columns. Bioelectromagnetics. 2020 May;41(4):308-317. doi: 10.1002/bem.22254. Epub 2020 Feb 11. PMID: 32043629; PMCID: PMC7217217.

Future EV infrastructure may even include wireless charging, which will simultaneously lead to strong magnetic field exposures capable of disrupting medical devices.[22] [23] EVs already have wireless emissions embedded, requiring calculations of multiple sources of exposure in concert with utility equipment.[24]

Dr. Ron Kostoff, with a Ph.D. in Aerospace and Mechanical Engineering from Princeton University and who has worked for Bell Laboratories, Mitre Corporation, and the Department of Energy, has noted that he cannot find measurement devices to measure the ~24 GHz and ~77 GHz frequencies emitted as part of 'safety' sensors in modern vehicles, but he can find indications levels are directed at passengers and likely exceed thermal levels.[25]

Researchers at the University of Mainz measured brain activity of a driver who step-by-step turned on the car, the air conditioning, the cellphone connection, and the WLAN with alarming disruption evidenced.[26] Research repositories are ripe with evidence that these exposures are harmful, so why build infrastructure rife with these exposures?

Assumptions need to be challenged. For example, as part of 'Equity pilots' in environmental justice communities, Eversource proposes a car-sharing program that may cost more or less than $2,000,000 and also proposes to establish electric fleets such as for buses and community transport that may cost more or less that $3,000,000.[27] Establishing these programs in environmental justice communities ironically causes harm, misleading consumers, while simultaneously charging for the opportunity.

Many questions exist, and the department and utilities need to find answers and share these with the public. For example, what are the measurements of power quality, power frequency fields, and radio-frequencies from Electric Vehicle Supply Equipment and other types of installations? Are there wireless components within the infrastructure and, if so, can these be proven safe or eliminated? Are there hazard zones?[28] Can hazard zones be fenced? Is wildlife

---

22 Tell RA, Kavet R, Bailey JR, Halliwell J. Very-low-frequency and low-frequency electric and magnetic fields associated with electric shuttle bus wireless charging. Radiat Prot Dosimetry. 2014 Jan;158(2):123-34. doi: 10.1093/rpd/nct208. Epub 2013 Sep 15. PMID: 24043876

23 M. Clemens, M. Zang, M. Alsayegh and B. Schmuelling, "High Resolution Modeling of Magnetic Field Exposure Scenarios in the Vicinity of Inductive Wireless Power Transfer Systems.," 2018 IEEE International Magnetics Conference (INTERMAG), 2018, pp. 1-1, doi: 10.1109/INTMAG.2018.8508403.

24 Z. Psenakova, D. Gombárska and M. Smetana, "Electromagnetic Field Measurement inside the Car with Modern Embedded Wireless Technologies," 2020 IEEE 21st International Conference on Computational Problems of Electrical Engineering (CPEE), 2020, pp. 1-4, doi: 10.1109/CPEE50798.2020.9238731.

25 Kostoff, Ron (2018 Sep 16) Dr. Ronald N. Kostoff on Automotive Radar and Electromagnetic Field Exposure in Cars. Environmental Health Trust. Available 4 September 2021 at https://ehtrust.org/dr-ronald-n-kostoff-on-automotive-radar-and-electromagnetic-field-exposure-in-cars/

26 Jürgen Kupferschmid Unter Strom: Autoelektronik versetzt Gehirn in Stress und Muskulatur unter Spannung. SalusMed. Available 3 September 2021 at https://salusmed.ch/unter-strom-autoelektronik-versetzt-gehirn-in-stress-und-muskulatur-unter-spannung/ ~ note a version of this in English can be found at the Environmental Health Trust

27 14 July 2021. Direct Pre-filed testimony of Kevin Boughan D.P.U. 21-90 on behalf of NSTAR Electric Company d/b/a Eversource EXHIBIT ES-KB-1 https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/13758159

28 Hosseini M, Monazzam MR, Farhang Matin L, Khosroabadi H. Hazard zoning around electric substations of petrochemical industries by stimulation of extremely low-frequency magnetic fields. Environ Monit Assess. 2015 May;187(5):258. doi: 10.1007/s10661-015-4449-y. Epub 2015 Apr 16. PMID: 25877640.

at risk? What is the cost of remediation? Are there differences between public, corporate, and occupational exposures?

ENVIRONMENTAL IMPACTS OF EV INFRASTRUCTURE

Wireless, electromagnetic noise, and strong fields from electricity are known to disturb flora and fauna, such as by sickening trees, disorienting birds, and interfering with hunting and nesting.[29] [30] [31] [32] Fostering wireless also threatens climate by contributing to global warming, because radiofrequencies contribute to heat.[33] Dielectric heating from wireless also harms insects like bees.[34] [35]

The entire purpose of moving towards EVs is protecting our environment by reducing carbon emissions, but needs to be assured rather than assumed. EVs can have greater carbon emissions than gas-powered vehicles when relying fossil fuels.[36] The biomass industry is also agitating hard to be allowed into the federal renewable energy standard, yet consumes mature trees at a pace faster than regeneration, contributing to carbon emissions through hauling, fuel burning, and loss of carbon sinks.[37] [38]

29 Shepherd et al., Extremely Low Frequency Electromagnetic Fields impair the Cognitive and Motor Abilities of Honey Bees, Scientific Reports volume 8, Article number: 7932 (2018)

30 Waldmann-Selsam, C., et al. "Radiofrequency radiation injures trees around mobile phone base stations." Science of the Total Environment 572 (2016): 554-69.

31 Červený Jaroslav, Begall Sabine, Koubek Petr, Nováková Petra and Burda Hynek . (2011) Directional preference may enhance hunting accuracy in foraging foxes. Biol. Lett.7355–357 http://doi.org/10.1098/rsbl.2010.1145

32 Levitt BB, Lai HC, Manville AM. Effects of non-ionizing electromagnetic fields on flora and fauna, part 1. Rising ambient EMF levels in the environment. Rev Environ Health. 2021 May 27. doi: 10.1515/reveh-2021-0026. Epub ahead of print. PMID: 34047144.

33 According to Dr. Livio Guiliani, PhD, Director of Research for the Italian Health National Service and spokesperson for ICEMS (dot edu), in a 6 April 2020 CHE-EMF email discussion to prevent heating of climate "**we need interim exposure limits based on PP - 0,1 W/sqm as in some Countries of Europe and in Russia, or less** - and **interim quality standards based on ALARA** - 1 mW/sqm, as in the Resolution of Salzburg (2000), or less- and i**nterim limits for occasional exposures** (not valid for earth cover from sky) deduced from the thermal threshold, having applied a safety factor equal to 100 (as in IRPA Guidelines 1989, instead 50 as in IEEE, 1992, or ICNIRP, 1998, standards), recognizing the thermal threshold at 2 W/Kg."

34 Thielens et al., "Exposure of Insects to Radio-Frequency Electromagnetic Fields from 2 to 120 GHz" Scientific Reports volume 8, Article number: 3924 (2018)

35 Thielens, A., Greco, M.K., Verloock, L. et al. Radio-Frequency Electromagnetic Field Exposure of Western Honey Bees. Sci Rep 10, 461 (2020). https://doi.org/10.1038/s41598-019-56948-0

36 Holzman DC. When it comes to electric vehicle emissions, location matters. Environ Health Perspect. 2012;120(6):A230-A231. doi:10.1289/ehp.120-a230a

37 Depro, Brooks M. Brian C. Murray, Ralph J. Alig, Alyssa Shanks. 2008. Public Land, Timber Harvests, and Climate Mitigation: Quantifying Carbon Sequestration Potential on U.S. Public Timberlands. Forest Ecology and Management 255 (2008) 1122–1134 http://naldc.nal.usda.gov/download/21039/PDF

38 Hudiburg, Tara W., Beverly E. Law, William R Moomaw, Mark E. Harmon, and Jeffrey E. Stenzel. 2019. Meeting GHG Reduction Targets Requires Accounting for All Forest Sector Emissions. Environ. Res. Lett. 14 (2019) 095005. https://doi.org/10.1088/1748-9326/ab28bb

Modern EV infrastructure resource demands have not been factored into energy-use calculations.[39] [40] For Level 2 chargers along streets alone, as expressed by Unitil, requirements include replacement of street pole, installation of underground electricity service, 3 pole-mounted transformers, a weather resistant cabinet, excavation, concrete footing, grading, utility meters, distribution panels, conduits, and breakers.[41] [42] Loss of energy and equipment damage is a known effect of poor power quality, which results from EV infrastructure – this also needs to be factored into energy calculations. [43] [44] [45] [46] [47] Katie Singer has also referenced reports that EVs will require more energy consumption than gas-powered automobiles, while adding to E-waste and contaminating water – these reports deserve investigation.[48]

A cradle-to-grave environmental evaluation of electric vehicles and infrastructure is needed that is fully funded, *independen*t of industry influence, and which evaluates energy footprint, resource consumption, service life, end-of-life removal costs, and environmental toxicity in addition to alternatives.

Independent evaluation is needed to compare electric cars to other investments, such as alternative fuels like hydrogen, different transportation systems, energy saving strategies,

39 Elgowainy A, Han J, Ward J, Joseck F, Gohlke D, Lindauer A, Ramsden T, Biddy M, Alexander M, Barnhart S, Sutherland I, Verduzco L, Wallington TJ. Current and Future United States Light-Duty Vehicle Pathways: Cradle-to-Grave Lifecycle Greenhouse Gas Emissions and Economic Assessment. Environ Sci Technol. 2018 Feb 20;52(4):2392-2399. doi: 10.1021/acs.est.7b06006. Epub 2018 Feb 8. PMID: 29298387.

40 Zhu L, Chen M. Research on Spent LiFePO4 Electric Vehicle Battery Disposal and Its Life Cycle Inventory Collection in China. Int J Environ Res Public Health. 2020 Nov 27;17(23):8828. doi: 10.3390/ijerph17238828. PMID: 33261047; PMCID: PMC7730360.

41 Unitil DPU 21-92 Exhibit CSVG-5 https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/13758181

42 To support complex metering including for electric vehicle chargers, National Grid has even sought to build its own personal communications network, including fiberoptic cable and wireless.

43 Ding Zejun, Zhu Yongqiang and Xu Yu, "Economic loss evaluation and selective treatment of power quality," 2010 5th International Conference on Critical Infrastructure (CRIS), 2010, pp. 1-4, doi: 10.1109/CRIS.2010.5617490.

44 IEC 61921 (2003). Power capacitors – Low voltage power factor correction banks.

45 A. Sharma, B.S. Rajpurohit, S.N. Singh, A review on economics of power quality: Impact, assessment and mitigation, Renewable and Sustainable Energy Reviews, Volume 88, 2018, Pages 363-372, ISSN 1364-0321, https://doi.org/10.1016/j.rser.2018.02.011.

46 M. Al-dabbagh , H Askarian , Rana Abdul , Jabbar Khan. (2001 Jan) Power quality and energy loss reduction in power systems. Available 7 September 2021 at https://www.researchgate.net/publication/254582980_POWER_QUALITY_AND_ENERGY_LOSS_REDUCTION_IN_POWER_SYSTEMS

47 Kola Sampangi Sambaiah, Thangavelu Jayabarathi (2020 Feb) Loss minimization techniques for optimal operation and planning of distribution systems: A review of different methodologies. International Transactions on Electrical Energy Systems. Volume30, Issue2. E12230 https://doi.org/10.1002/2050-7038.12230

48 Singer, Katie. (3 November 2020) Proposing Cradle-to-Grave Evaluations for All Vehicles. Wall St. International Magazine. https://wsimag.com/science-and-technology/63818-proposing-cradle-to-grave-evaluations-for-all-vehicles

infrastructure efficiency, life-style adjustments, and urban planning impacts.[49] [50] [51] [52] For example, quarantine led to significant carbon emission reductions in China.[53] Climate quarantines can cause disparate economic harm, but investments in alternative economies and urban planning can respectfully reduce automobile reliance.

PROPERTY DAMAGE FROM EV INFRASTRUCTURE

EV infrastructure presents significant potential for property loss, and this needs to be factored into budget projections and comparisons to alternative solutions.

Poor power quality can damage property, causing equipment deterioration, shutdowns, and misoperation at home and work.[54] [55] [56] [57] A 2008 in-depth European Power Quality study found industrial loss to be 4% of turnover rate, even exempting data centers, and in excess of 135 billion Euro within Europe.[58] A 2001 study found a 2-second power quality interuption cost industry $37.03/kW.[59]

49 Stephens-Romero S, Carreras-Sospedra M, Brouwer J, Dabdub D, Samuelsen S. Determining air quality and greenhouse gas impacts of hydrogen infrastructure and fuel cell vehicles. Environ Sci Technol. 2009 Dec 1;43(23):9022-9. doi: 10.1021/es901515y. PMID: 19943683

50 Frey HC, Zhai H, Rouphail NM. Regional on-road vehicle running emissions modeling and evaluation for conventional and alternative vehicle technologies. Environ Sci Technol. 2009 Nov 1;43(21):8449-55. doi: 10.1021/es900535s. PMID: 19924983.

51 Zhou C, Li S, Wang S. Examining the Impacts of Urban Form on Air Pollution in Developing Countries: A Case Study of China's Megacities. Int J Environ Res Public Health. 2018 Jul 24;15(8):1565. doi: 10.3390/ijerph15081565. PMID: 30042324; PMCID: PMC6121357

52 Jones SJ. If electric cars are the answer, what was the question? Br Med Bull. 2019 Mar 1;129(1):13-23. doi: 10.1093/bmb/ldy044. PMID: 30615073.

53 Wang Q, Su M. A preliminary assessment of the impact of COVID-19 on environment - A case study of China. Sci Total Environ. 2020 Aug 1;728:138915. doi: 10.1016/j.scitotenv.2020.138915. Epub 2020 Apr 22. PMID: 32348946; PMCID: PMC7195154.

54 A. Sharma, B.S. Rajpurohit, S.N. Singh, A review on economics of power quality: Impact, assessment and mitigation, Renewable and Sustainable Energy Reviews, Volume 88, 2018, Pages 363-372, ISSN 1364-0321, https://doi.org/10.1016/j.rser.2018.02.011.

55 Shih-An Yin, Chun-Lien Su and Rung-Fang Chang, "Assessment of power quality cost for high-tech industry," 2006 IEEE Power India Conference, 2006, pp. 6 pp.-, doi: 10.1109/POWERI.2006.1632616

56 Ding Zejun, Zhu Yongqiang and Xu Yu, "Economic loss evaluation and selective treatment of power quality," 2010 5th International Conference on Critical Infrastructure (CRIS), 2010, pp. 1-4, doi: 10.1109/CRIS.2010.5617490.

57 J. G. Dougherty and W. L. Stebbins, "Power quality: a utility and industry perspective," 1997 IEEE Annual Textile, Fiber and Film Industry Technical Conference, 1997, pp. 5. 10 pp.-, doi: 10.1109/TEXCON.1997.598528.

58 Targosz, Roman, Jonathan Manson. European Power Quality Survey Report. LPQI, 2008. https://idoc.pub/documents/european-power-quality-survey-report-zpnxke9qwy4v

59 Y. Shih-An, S. Chun-Lien, C. Rung-Fang. Assessment of PQ cost for high-tech industry. Power India Conference, 2006 IEEE, 2006.

Cyberattack on EV chargers could damage home or community power distribution, service, and hardware; hacks may disable or command a single vehicle or a fleet; access home WiFi or a mobile App, and steal data for identify theft. [60] [61] [62] [63]

Who bears liability for dangerous and poor investments? Filings in the above-captioned and other D.P.U. dockets by numerous parties are warnings based upon peer-reviewed science, likelihood of lawsuit, and potential for a court ruling that makes smart grid investments obsolete.[64] [65] [66] [67] [68] Liability may exist for infringements on constitutional privacy, property rights, and health.

RECONSIDER EV INVESTMENTS

In light of the foregoing, EV costs and investments need to be reconsidered. Total EV infrastructure spending forecast is estimated as $469.7 million in total from National Grid and Eversource, while Unitil lists $1.01 million.[69] These investments should be set aside and remediated or reconsidered. Why not instead invest in a car-free future, like Barcelona?

Utilities have a conflict of interest which may explain their drive even when new technologies fail to live up to marketing expectations. Investor-owned utilities can earn a profit, a Return On Equity invested (ROE) into distribution infrastructure:

---

60 S. Acharya, Y. Dvorkin, H. Pandžić and R. Karri, "Cybersecurity of Smart Electric Vehicle Charging: A Power Grid Perspective," in IEEE Access, vol. 8, pp. 214434-214453, 2020, doi: 10.1109/ACCESS.2020.3041074

61 Cyber Security Issues of Internet with Electric Vehicles. Pouted. Available 14 September 2021 at https://www.pouted.com/cyber-security-issues-of-internet-with-electric-vehicles/

62 Barney Carlson & Ken Rhode (2018 Sept 12) Cybersecurity of DC Fast Charging: Potential Impacts to the Electric Grid. Idaho National Laboratory. INL/MIS-18-5128. Available 7 September 2021 at https://avt.inl.gov/sites/default/files/pdf/presentations/INLCyberSecurityDCFC.pdf

63 Kim M, Park K, Yu S, Lee J, Park Y, Lee SW, Chung B. A Secure Charging System for Electric Vehicles Based on Blockchain. Sensors (Basel). 2019 Jul 9;19(13):3028. doi: 10.3390/s19133028. PMID: 31324058; PMCID: PMC6651179.

64 Ed Friedman v. Central Main Power Company. ORDER ON DEFENDANT'S MOTION TO DISMISS. No. 2:20-cv-00237-JDL (1st Cir. 2021) Available at https://ehtrust.org/wp-content/uploads/R.-Doc.-26-Friedman-ADA-Order-Denying-CMP-MTD-3-31-21.pdf

65 Emily Cohen (2020 Nov 11) Court ruling throws Pennsylvania smart-meter plan into turmoil. The Philadelphia Inquirer. Available 7 September 2021 at https://www.inquirer.com/business/peco-puc-pennsylvania-commonwealth-court-smart-meter-decision-20201111.html

66 Consolidated brain cancer from cellphone cases currently winding through courts including Michael Patrick Murray, et al., v. Motorola, Inc., et al.," Case No. 2001 CA 008479 B in the Superior Court for the District of Columbia

67 See dockets 13-83, 20-69, 16-28, 17-53, 21-80, 21-81,18-28, 21-82, 21-90, 12-76 ALL critical submissions and attachments including but not limited to that of Dr. Lisa Nagy, joint comments, Ken Gartner, Einar Olsen, Helen Walker, Kirstin Beatty, MACI, Dr. William Maykel and Patricia Burke, Dr. Beatrice Golomb, Reply comments by Patricia Burke, Kirstin Beatty, Kirstin Beatty, Jean Lemiux, Dr. William Bruno, Sandra Chianfoni and Laura Catullo, Exhibit 3 by Kirstin Beatty, Thea Fornier Wireless Technology Health Effects, Dr. Robert Gilmore Pontius Jr, PhD, EMR Policy Institute, Dr. William Rea, Dr. Carpenter, EMR Policy Institute, and many more in all the dockets far too numerous to list here.

68 Ken Gartner observes, in his 21-90 to 92 testimony that the utilities offer to sell EV charging installations to municipalities and that municipalities not only are poorly suited to manage such installations but will will be left liable. What also is the cost of removing and recycling such installations? Reference: Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid D.P.U. 21-91 Exhibit NG-EVPP-1 (July 14, 2021) pp. 50-51

69 See Notice of Public Hearing filed in each respective docket for the utilities.

> *Utilities profit primarily by buying new equipment ("smart" meters, power lines, transformers), charging ratepayers interest on this investment and paying less taxes as the equipment depreciates over time. The higher the investment risk, the higher the rate of return. The rate of return decreases each year. Once the rate of return reaches zero, the utility operates and maintains the equipment with no profit.*[70]

Eversource reported an increase of 34% in profits for 2021 – this is an enormous profit.[71]

The utility profit model needs to be redesigned to encourage saving money, energy, health, nature, and existing investments.

In sum, here are the final recommendations for the department and utilities:

- Stall EV infrastructure plans;
- Adopt the ALARA principle;
- Establish policies to regularly monitor and share with the public electromagnetic measurements from the grid, including before and after corrective measures.
- Based upon a full accounting, examine whether EV infrastructure and EVs saves or costs resources and energy;
- Examine how EV infrastructure can be modified to respect privacy and protect reliability and security;
- Identify if liability remains, for whom liability exists;
- If EV infrastructure is a net environmental positive and health can be protected, prepare an adjusted budget and timeline to reflect new expenditures to fix problems;
- If remediation is not possible or problematic, lobby the legislature to halt EVs and attendant infrastructure.

Sincerely, on this __ day of September 2021, signed by all parties here listed:

Kirstin Beatty
Director, Last Tree Laws
149 Central Pk Dr
Holyoke, MA 01040

Patricia Burke
Stop Smart Meters MA
Halt MA Smart Meters
Scientific Alliance for Education
8 Eden Street
Leslie Saffer

Worcester Info Team for Health (WITH)
392 Mill Street
Worcester, MA 01602

Laura Josephs
7 Conway Dr. #2
Greenfield MA 01301

Virginia Bradley Hines, PA, LMHC
Director, The EMR Network
Member, Concord Safe Technology [MA]

70 Singer, Katie. (3 Feb 2020) Basic needs, electrified: What we expect from electricity. Wall St. International Magazine. https://wsimag.com/economy-and-politics/64758-what-we-expect-from-electricity

71 Crowley, B (21 Feb 2021) Strong Revenues in Connecticut Boost $1.2 Billion Profit for Eversource, CT Examiner. https://ctexaminer.com/2021/02/21/strong-revenues-in-connecticut-boost-1-2-profit-for-eversource/

Liberty Goodwin, Director
Toxics Information Project (TIP)
P.O. Box 40572, Providence, RI 02940

Alexia McKnight, DVM, DACVR
258 Heyburn Rd.
Chadds Ford, PA 19317Nikki Florio
Founder/Director of Bee Heroic
7823 W 38th Ave.
Wheat Ridge Colorado 80033

Eugene J. Bazan, Ph.D.
Secretary, PA Smart Meter Work Group
PO Box 24
Lemont, PA 16851

Lisa Lovelady
Stop 5GJax
4249 Ortega Place,
Jacksonville, Florida 32210

Cynthia Franklin, Director
Consumers for Safe Cell Phones
829 Briar Rd.
Bellingham, WA 98225