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January 25, 2017

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, Second Floor
Harrisburg, PA 17120

RE: Catherine Frompovich v. PECO Energy Company
Docket No. C-2015-2474602

Dear Ms. Chiavetta:

Enclosed please find the Main Brief of PECO Energy Company.

A Certificate of Service evidencing that service is attached for filing.

Very truly yours,



Ward L. Smith
Counsel for PECO Energy Company

WS/ab
Enclosure

cc: Christopher P. Pell, ALJ
Darlene D. Heep, ALJ
Certificate of Service

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Catherine Frompovich

v.

PECO Energy Company

Docket No. C-2015-2474602

CERTIFICATE OF SERVICE

I, Ward L. Smith, hereby certify that I have this day served a copy of PECO Energy Company's letter via email to:

Catherine J. Frompovich
23 Cavendish Drive
Ambler, PA 19002

Dated at Philadelphia, Pennsylvania, January 25, 2017



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Main Brief of PECO Energy Company

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Introduction

The primary purpose of the evidentiary hearing in this matter was to provide the Complainant, Catherine Frompovich, who is a breast cancer survivor, the opportunity to present evidence to support her claim that a PECO AMI meter¹, if installed at her home, would interfere with her ability to heal and live cancer free. As the Commission stated in its April 26, 2016 Opinion and Order that remanded this matter for hearing (p. 11) (emphasis added):

Those specific allegations that we conclude warrant providing the Complainant a hearing are her status as a breast cancer survivor with concerns over smart meter emissions, who fears for her health status if a smart meter is installed, and who remains under medical care for her condition by *a physician prepared to offer his medical opinion* that the radio frequencies emitted by a smart meter installed in the Complainant's home will interfere with her ability to heal and live cancer free.

At the hearing Ms. Frompovich presented no medical testimony or medical records to support her claim. Although the presiding officers recognized Ms. Frompovich as an expert in a very limited field related to nutrition and natural healing, the testimony that she offered did not provide any medical or scientific evidence to support her claims – she simply restated her beliefs.

For its part, PECO presented extensive testimony demonstrating that its AMR meter did not cause Ms. Frompovich's cancer symptoms and that its AMR or AMI meter will not interfere with her ability to heal and live cancer free. PECO presented the testimony of two eminent experts, Dr. Christopher Davis and Dr. Mark Israel. That testimony provides a preponderance of the evidence showing that PECO's AMR and AMI meter did not, and cannot, cause the harm complained of by Ms. Frompovich.

¹ PECO's legacy meters, known as "AMR meters" (Automatic Meter Reader meters) and its new meters, known as "AMI meters" ("Advanced Meter Installation meters") both use radiofrequency transmissions to communicate meter readings back to the utility. Both types of technology are sometimes grouped together as "smart meters." In this brief, PECO typically differentiates whether it is speaking about AMR, AMI, or both.

Background and Procedural History

The Commission's April 21, 2016 Opinion and Order (pp. 2-5) contains a detailed procedural history of this proceeding through the date of that Opinion and Order. PECO adopts the Commission's discussion, and will not repeat it here.

Since April 28, 2016, the only procedural developments of consequence have been a two-day evidentiary hearing on November 2-3, 2016, and the exchange of main briefs today, January 25, 2017.

Proposed Findings of Fact

1. The Complainant is Catherine Frompovich, a retired consulting natural nutritionist with a Ph.D. in Nutrition and Holistic Sciences. Tr. 22, 25.
2. The Respondent is PECO Energy Company.
3. Complainant is currently a PECO electric customer on Cavendish Drive in Ambler, PA. Tr. 7-8.
4. The Complainant lives in a condominium townhouse in a row of eight similar buildings. Tr. 16.
5. Complainant's residence has an AMR installed on the front of the house. Tr. 58.
6. To date, PECO has not installed an AMI meter at the Complainant's home. Tr. 105.
7. As of the hearing date, PECO continued to provide electric service to the Complainant.
8. Ms. Frompovich filed her complaint because she is a breast cancer survivor and she believes that radiofrequency transmissions from an AMI meter will affect her health. Tr. 16.
9. Ms. Frompovich is concerned that "dirty electricity" from an AMI meter will harm her health. Tr. 34, 37.

10. Ms. Frompovich believes that installation of an AMI meter will counteract or adversely affect the holistic treatment that she has used for her breast cancer. Tr. 42-43, 56.

11. Ms. Frompovich will not accept any option to relocate the AMI meter to a new location because, in her opinion, an AMI meter will send dirty electricity into her house regardless of its location. Tr. 59-60, 74-75.

12. Ms. Frompovich used a "Trifield meter," which is a handheld measuring device, to measure radiofrequency fields near AMI meters in her condominium complex. When she did so, the needle "went all the way to the very end." Tr. 14.

13. Brenda Eison is a Customer Service Manager for PECO, currently working with the AMI Project to install AMI meters. Tr. 100.

14. Ms. Eison is responsible for answering questions that customers may have related to AMI installation. Tr. 101.

15. If a customer refuses an AMI meter, the customer is referred to Ms. Eison for consultation. Tr. 102.

16. Ms. Eison provides these customers with information related to AMI meters, including radiofrequency levels, the safety of the meter, and meter privacy. Tr. 103.

17. On January 23, 2014, PECO sent a 45-day letter to Ms. Frompovich advising her that its vendor would be in the neighborhood to install an AMI meter at her home. Tr. 105, PECO Exh. BE-1.

18. On February 17, 2014, PECO received correspondence from Ms. Frompovich advising that she did not want an AMI meter installed at her residence. Tr. 105, PECO Exh. BE-2.

19. On February 19, 2014, PECO sent Ms. Frompovich two letters responding to her February 17 letter. In addition, a PECO employee contacted Ms. Frompovich to verbally give her information about AMI meters, but Ms. Frompovich hung up on her. Tr. 105-06, 118-19, PECO Exh. BE-3 and BE-4.

20. On February 9, 2015, PECO sent Ms. Frompovich a letter to once again attempt to install the AMI meter. Tr. 107, PECO Exh. BE-5.

21. On February 14, 2015, Ms. Frompovich responded that she did want an AMI meter installed at her residence, and requested an “opt out” from installation. Tr. 107-08, PECO Exh. BE-5.

22. On February 20, 2015, PECO’s legal department sent a reply letter to Ms. Frompovich’s February 14 letter. Tr. 108-09, PECO Exh. BE-6.

23. On February 25, 2015, PECO received a letter from Ms. Frompovich asking 11 additional questions regarding AMI meters. Tr. 109, PECO Exh. BE-7.

24. On March 9, 2015, PECO’s legal department sent Ms. Frompovich a reply letter addressing her 11 questions. Tr. 110-111, PECO Exh. BE-8.

25. On March 16, 2015, PECO received a letter from Ms. Frompovich with about 20 pages of additional information about smart meters. This letter also attached a letter from Ms. Frompovich’s physician. Tr. 111-12, 121, PECO Exh. BE-9.

26. On March 20, 2015, PECO’s legal department sent Ms. Frompovich a reply letter acknowledging receipt of her March 16 letter and stating that PECO does not have an opt out option for AMI installation and that continued refusal to allow installation could result in service termination. Tr. 112-13, PECO Exh. BE-10.

27. On March 24, 2015, PECO received a letter from Ms. Frompovich advising it that she had filed a formal complaint with the Commission. Tr. 113, PECO Exh. B-11.

28. On March 31, 2015, PECO received official notice from the Commission that Ms. Frompovich had filed a formal complaint. Tr. 113.

29. On March 31, 2015, PECO placed the account on delay pending the results of the Commission complaint matter, meaning that the account would not be fielded for AMI installation or termination during the pendency of the complaint process. Tr. 113-14.

30. After the filing of the formal complaint, Ms. Eison and Ms. Frompovich did not have further communication. Tr. 114.

31. Ms. Frompovich subsequently received a call from “a young woman” from PECO (PECO counsel Ms. Lee) who wanted to send an engineer to Ms. Frompovich’s home to review the possibility of relocating her meter – but Ms. Frompovich hung up on her before the call developed. Tr. 73-74.

32. Glenn Pritchard is the manager of PECO’s Advanced Grid Operations & Technology Group. Tr. 126.

33. The term “AMR” stands for Automatic Meter Reading. Tr. 129.

34. The AMR System, also known as the Legacy System, is the system that is used by PECO to read AMR based meters. Tr. 129-31, PECO Exh. GP-1.

35. PECO began installing the AMR system in 2000 and completed installation in 2003. Tr. 131.

36. Under the AMR system, an electric meter transmits data once every five minutes throughout the day to a device called a MicroCell Controller. Tr. 129-30, PECO Exh. GP-1.

37. The AMR transmission is one-way and there is no way to communicate to the meter. PECO Exh. GP-1.

38. Once the customer's data is received by PECO's internal applications, the information is integrated with PECO's Meter Data Management System (MDMS), which data is then ultimately used to produce customer bills. PECO Exh. GP-1.

39. All PECO customers, including the Complainant, had an AMR meter. Tr. 131.

40. The AMR system operates at a frequency of 902 to 927 megahertz, and the power output during transmission is one watt. Tr. 130-31.

41. AMI stands for Advanced Metering Infrastructure. Tr. 131.

42. PECO is currently using an AMI Advanced Meter Platform to read meters. PECO Exh. GP-2.

43. AMI meters are two-way communication meters. Tr. 132.

44. The AMI meters communicate with a Tower Gateway Base Station, which is a collector that PECO has typically located in substations. Tr. 132, PECO Exh. GP-2.

45. On average, AMI meters transmit ten times a day, but can also be configured or "tuned" to transmit at a maximum of 96 times per day, or once every 15 minutes. Tr. 133.

46. PECO's AMI meters are designed so that the FlexNet communication module transmits away from the house, not towards it. Tr. 163.

47. The FlexNet communication module, which communicates from the AMI meter to the Tower Gateway Basestation, operates at a licensed frequency of 901.1 MHz. In its service territory, PECO is the sole user of its licensed spectrum. Tr. 135.

48. Most other utilities have not chosen to use a licensed spectrum approach to smart meter technology. Instead, they operate in the Industrial, Scientific, and Medical ("ISM") band, meaning that they must compete with other users to have their signals heard. Tr. 136.

49. PECO's use of a licensed spectrum eliminates signal competition and allows it to transmit signals far less frequently than technologies that use the ISM band. Tr. 136.

50. PECO's use of a licensed spectrum allows it to use a non-mesh technology. Tr. 136-37.

51. Because PECO does not use a mesh system, its AMI meters do not transmit with a daily periodicity of 9600 transmissions. Tr. 137.

52. The Zigbee radio, which communicates from the AMI meter to devices in the residence, operates at 2.4 GHz. Tr. 135.

53. PECO began installing the AMI system in 2010 in direct response to Pennsylvania Act 129 of 2008. Tr. 137.

54. Act 129 requires that AMI meters have functionalities that do not exist with the AMR system, including bidirectional communications, sampling energy usage every hour, being able to transmit information into the home (which PECO has implemented through the Zigbee radio), and remote connect/disconnect capability. Tr. 137, 168.

55. If one attempts to measure the output of an installed AMR or AMI meter in the field using a handheld measuring device, the device will measure the signal from the AMR or AMI meter and from other sources such as cell phones, wireless phones, baby monitors, garage door openers, security systems, other AMR or AMI meters in the neighborhood, and TV antennas transmitting at UHF frequencies. Tr. 137-139.

56. When using such a handheld measuring device in the real world, there is no way to isolate the AMR or AMI meter from these other sources to ensure that one is only measuring the output from the AMR or AMI. Tr. 139.

57. “Dirty electricity” is not a scientific term. It refers to the possibility of harmonic disruptions to the sinusoidal wave of electricity. Tr. 140, 198.

58. Disruptions of the sinusoidal wave occur on electricity as it goes into the American home due to, for example, the earth’s magnetic field, interruptions from the sun, and any device that is plugged into the electric system, including fluorescent lights, devices that have power supplies, computers, cell phone chargers, and refrigerators. Each of these devices can disrupt the normal sinusoidal wave of electricity. Tr. 140-41.

59. Harmonics are inevitable because nearly all of the electricity that we generate is produced by rotating machinery, which will produce higher harmonics. Tr. 199.

60. PECO AMI meters do not meaningfully contribute to harmonics and disruption of the sinusoidal wave. Tr. 142, 200,

61. A home without an AMI meter will still have significant disruption of the sinusoidal wave, even if the resident of that home has eliminated microwaves and other sources of radiofrequency fields. Tr. 142-43.

62. A home with an AMR meter will still have significant disruption of the sinusoidal wave. Tr. 171.

63. When PECO first began to install AMI meters, the question was raised as to whether a particular brand of meter was associated with fires. PECO recognized this issue, investigated, and concluded it would no longer use that brand of meter. PECO removed all such meters and replaced them with Landis + Gyr meters in 2012. Tr. 143.

64. Since the Landis + Gyr meters were installed in 2012, there have been no reports of any fires caused by the Landis + Gyr meters. Tr. 143-44.

65. The customer decides where to put the meter socket, as long as that location meets the guidelines established in PECO's Electric Service Tariff. Tr. 144-45, PECO Exh. GP-3.

66. PECO would install an AMI meter in a relocated meter socket if the Complainant chose to relocate her meter socket. Tr. 144-45.

67. An Advanced Meter Service Provider (AMSP) is a third party permitted by Section 14.1 of PECO's Electric Service Tariff to read its electric meters. Tr. 145, PECO Exh. GP-3.

68. AMSPs must be licensed by the Commission. Tr. 167, PECO Exh. GP-3.

69. Currently, there are not any licensed AMSP's on PECO's system. Tr. 145.

70. One cannot tell the activities of a resident in the home from the data collected by an AMI meter. The data simply reports how much electricity is being used over each hour period. Tr. 145.

71. PECO's AMI meters have been tested for compliance and comply with UL standards. Tr. 158, 173-75.

72. When the AMR system is retired in April 2017, the AMR meters will no longer transmit usage data to PECO. Tr. 166.

73. PECO's AMI meters do not use pulsed transmissions. Tr. 173, 200.

74. Dr. Christopher Davis is a professor of electrical and computer engineering at the University of Maryland in College Park and he studies physics, biophysics, electrical engineering, electromagnetics, radiofrequency exposure and dosimetry. Tr. 184-189.

75. Dr. Davis has studied the types of radiofrequency fields that are periodically emitted from PECO's AMR and AMI meters. Tr. 186-189.

76. The Federal Communications Commission (FCC) has indicated that maximum permissible exposure to radiofrequency fields emitted by a Smart Meter is 0.6 mW/cm^2 , calculated as an average exposure over time. Tr. 207, PECO Exh. CD-2.

77. The average exposure from PECO's AMI meters is millions of times less than the FCC maximum permissible exposure levels. Tr. 207.

78. The peak exposure from PECO's AMI meters is at least 35 times less than the FCC average-exposure standards. Tr. 209.

79. In everyday life, people are exposed to radiofrequency field levels from many sources that are much higher than the radiofrequency fields associated with PECO's AMR or AMI meters. Tr. 212-217.

80. The existing AMR meter at Ms. Frompovich's residence emits 6.4 times more radiofrequency fields than an AMI meter would. Tr. 215.

81. Dr. Davis testified, to a reasonable degree of scientific certainty, that “AMI meters are incapable of causing any biological effects, certainly no adverse biological effects, in anybody.” Tr. 216.

82. Dr. Mark Israel attended the Albert Einstein College of Medicine, had an Internship and Residency at Harvard Medical School and has studied radiofrequency fields and health effects. Tr. 254.

83. Dr. Israel began to examine the research on electromagnetic fields, including radiofrequency fields, and health effects during his tenure at the National Cancer Institute more than more than 25 years ago. He has continued to follow the research literature on this subject since that time. Tr. 255-59, 327.

84. Dr. Israel concluded that radiofrequency fields from AMR and AMI meters would not contribute to or cause either the occurrence or recurrence of Ms. Frompovich’s breast cancer. Tr. 268.

85. Dr. Israel concluded that there is no basis to consider that radiofrequency fields from AMR and AMI meters could affect the immune system. Tr. 270.

86. Dr. Israel concluded that there is no scientific basis for concluding that radiofrequency fields from AMR and AMI meters can cause, contribute to or exacerbate conditions or symptoms associated with the claim of Idiopathic Environmental Intolerance, which is also referred to as electro-hypersensitivity. Tr. 283.

87. The International Agency for Research on Cancer (“IARC”) has categorized fields from cell phones as 2B – which is a designation for substances, mixtures and exposures that are possibly carcinogenic to humans. This is a category in which the data that is available is limited and one cannot distinguish as to whether the claimed association is by chance, bias, or confounding. Tr. 42, 283.

88. The IARC designation of radio frequency fields as “possibly” carcinogenic does not apply to breast cancer. Tr. 283-84.

89. The letter written by the American Academy of Environmental Health (which was discussed by Ms. Frompovich in her testimony) advocates for a position that is not consistent with the mainstream of scientific thought on these issues. Tr. 284-285.

90. The National Toxicological Program study (which was discussed by Ms. Frompovich in her testimony) is incomplete and partial, and it is premature to have an opinion about it. Tr. 286.

91. Dr. Israel’s overall medical opinion, which he holds to a reasonable degree of medical certainty, is that exposure to radiofrequency fields from AMR and AMI meters have not been and will not be harmful to Ms. Frompovich. Tr. 294.

92. In Dr. Israel’s opinion, radiofrequency fields would not interfere with the body’s ability to heal. Tr. 323.

93. Dr. Israel concluded that there is no scientific basis for concluding that exposure to radiofrequency fields would increase stress. Tr. 325.

Summary of Argument

As the Complainant, Ms. Frompovich has the burden of proving her claim that PECO's AMI will interfere with her ability to heal and live cancer free. She did not meet that burden. She did not present any medical testimony or medical records to support her claims. Her own testimony, while recognized as expert testimony in a narrow field, established only that she believes that the AMI will harm her, but did not present any medical evidence in support of that belief. PECO, however, presented expert testimony that demonstrates:

- Radiofrequency fields from PECO's AMI meters are millions of times lower than the FCC's Maximum Permissible Exposure Limit (and also to international exposure guidelines)
- Radiofrequency fields from the new AMI meters are substantially less than the radiofrequency fields associated with the AMR meter that has been in place at Ms. Frompovich's residence for many years
- Radiofrequency fields from the new AMI meters are substantially less than those regularly encountered in everyday life
- The scientific literature does not provide a reliable medical basis to conclude that radiofrequency fields associated with AMI meters could cause, contribute to, or aggravate *any* health effects or conditions
- The scientific literature does not provide a reliable medical basis to conclude that radiofrequency fields associated with AMI meters could cause, contribute to or aggravate the specific symptoms identified by Ms. Frompovich, nor that they could or will interfere with her ability to heal and live cancer free
- PECO's meters do create "dirty electricity" or use "pulses"
- PECO's AMI meters do not cause fires

PECO' tariff allows a customer to choose the location of their meter board and socket; this provides a reasonable alternative for meter relocation. Ms. Frompovich rejected this alternative, hanging up when PECO legal counsel called her to discuss this alternative. PECO

also has a tariff provision that allows third party Advanced Meter Service Providers to offer competitive metering services, although none have currently obtained Commission licenses to do so.

Numerous other state utility commissions have reviewed the science on smart meters and health and concluded that AMI meters are safe and their use in the provision of utility service is reasonable.

Given the above, the use of AMI meters constitutes “reasonable utility service” for purposes of 66 Pa. C.S. §1501.

Argument

I. Ms. Frompovich did not meet her burden of proving, by a preponderance of the evidence, that PECO's AMR or AMI meter caused any adverse health conditions or will interfere with her healing or ability to live cancer free

A. Ms. Frompovich has the burden of proving that PECO's AMR or AMI meter caused her adverse health conditions or will interfere with her healing or ability to live cancer free

It is axiomatic in all Commission formal complaint proceedings that the Complainant has the burden of proof. *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Cmwlth. 1990), *alloc. denied*, 529 Pa. 654, 602 A.2d 863 (1992).

In the seminal Commission case allowing an AMI/health hearing – *Kreider v PECO* – the Commission made clear that this general rule applies to AMI/health proceedings, stating (Jan. 28, 2016 Order, pp. 21-23, emphasis added) that:

Holding a hearing in this case, to address Ms. Kreider's factual averments regarding the specific health effects she experienced after the smart meter was installed outside of her bedroom, will enable us to closely evaluate these claims based on a fully developed evidentiary record.

[A]s we expressed in the *September 2015 Order*, while we find that the Complainant should have the opportunity to be heard on her averments *regarding the "deleterious health symptoms" related to the smart meter, the Complainant will have the burden of proof during the proceeding to demonstrate, by a preponderance of the evidence, that PECO is responsible or accountable for the problem described in the Complaint.* 66 Pa. C.S. § 332(a); *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Cmwlth. 1990), *alloc. denied*, 529 Pa. 654, 602 A.2d 863 (1992). *In order to carry this burden of proof, the Complainant may be required to present evidence in the form of medical documentation and/or expert testimony.* The ALJ's role in the proceeding will be to determine, based on the record in this particular case, whether there is sufficient evidence to support a finding that the Complainant was adversely affected by the smart meter or whether PECO's use of a smart meter to measure this Complainant's usage will constitute unsafe or unreasonable service in violation of Section 1501 under the circumstances in this case. (emphasis added).

In its April 26, 2016 Opinion and Order remanding the *Frompovich* complaint for hearing (p.12), the Commission established this same rule, albeit stated in shorter fashion (emphasis added):

As in *Kreider* and *Paul*, Ms. Frompovich has alleged factual averments specific to her that, if proven, could implicate, under her particular circumstances, a violation of Section 1501 of the Code, a statute the Commission has jurisdiction to administer. See Complaint at 3. *We caution both parties that in granting, in part, the Complainant's Exception No. 3 regarding her individual and specific health issues, the operative words are "if proven."*

In sum, Ms. Frompovich has the burden of proving her individual and specific health claims.

PECO understands that Ms. Frompovich sincerely believes that, if an AMI meter is installed at her residence, it will interfere with her ability to live cancer free. Her belief, however, is not the issue under examination in this remand. She must prove more than her own belief - she must medically prove "that the radio frequencies emitted by a smart meter installed in the Complainant's home will interfere with her ability to heal and live cancer free." Indeed, the Commission specifically stated that a hearing in this case was warranted because Ms. Frompovich "remains under medical care for her condition by *a physician prepared to offer his medical opinion* that the radio frequencies emitted by a smart meter installed in the Complainant's home will interfere with her ability to heal and live cancer free."

PECO respectfully submits that the Commission's reference to the use of "medical documentation and/or expert testimony" in the *Kreider* Order, coupled with the remand to take evidence from "a physician prepared to offer his medical opinion" in the instant proceeding, underscores that the primary purpose of this remand is to determine whether Ms. Frompovich's

beliefs are supported *by a preponderance of medical proof*. That is what Ms. Frompovich has the burden of proving.

B. Ms. Frompovich did not present any medical testimony or records. Her testimony, which was accepted as expert testimony within a narrowly defined field of expertise, simply stated her belief that PECO's AMI meter will interfere with her ability to heal and live cancer free, but she did not provide medical evidence to support that belief

As noted in the prior section of this brief, the Commission remanded this matter to take medical evidence from Ms. Frompovich's treating physician, stating that a hearing was warranted in part because she "remains under medical care for her condition by *a physician prepared to offer his medical opinion* that the radio frequencies emitted by a smart meter installed in the Complainant's home will interfere with her ability to heal and live cancer free."

At the evidentiary hearing, however, Ms. Frompovich's treating physician did not appear. Tr. 16-18. Ms. Frompovich stated that her doctor was not able to free time on his schedule to testify. Tr. 18.

As to medical records, Ms. Frompovich did not introduce or discuss any of her medical records. When asked whether she wished to introduce any of her medical records in support of her claim, she demurred, stating: "No, I do not. They're nobody's business." Tr. 79.

PECO respectfully submits that this dearth of medical evidence is, by itself, dispositive of this case. The case was remanded for the specific purpose of allowing Ms. Frompovich to introduce medical evidence and she produced no medical evidence of any sort. Her treating physician did not appear. She did not introduce any medical records. Consequently, the only conclusion that can be reached is that she did not meet her burden of moving forward on the presentation of medical evidence; indeed, she did not present a *prima facie* case on the remand

issue (medical proof) because she did not present one scintilla of medical evidence. This case can and should be dismissed on that basis alone.

Because of this dearth of medical evidence, Ms. Frompovich's case is entirely composed of and reliant on her own testimony. The presiding officers recognized Ms. Frompovich as an expert "in a very limited area on nutrition, natural healing, and treating cancers from that perspective." Tr. 33. As an expert, she was allowed to rely upon, refer to, and introduce several documents and studies by persons who did not appear at the hearing; PECO will address those studies shortly. More generally, however, Ms. Frompovich's actual opinion with respect to health was only sparingly stated (although the presiding officers repeatedly asked her to state that opinion). When asked by Administrative Law Judge Heep to describe what aspect of an AMI meter would adversely affect her health, Ms. Frompovich identified "dirty electricity" as the primary issue of concern to her. Tr. 33-34. When asked how dirty electricity would adversely affect her health, however, her reply, Tr. 34, was not at all illuminating:

Well, cancer is – there's a thing called nonthermal effects from microwave energy. The industry only recognizes thermal energies which means this was information they have had since the Second World War. It's not been updated because all the information that would make the microwave transmissions safe would have to be reduced greatly.

A few minutes later, Ms. Frompovich was again asked to describe how the AMI meter would adversely affect her health. ALJ Heep first established that Ms. Frompovich had utilized holistic healing methods for her breast cancer, and then asked: "And so is it correct that what you're saying here today is that installation of the Smart Meter will counteract or adversely affect such treatment?" Ms. Frompovich replied: "Yes, Your Honor. I affirm that definitely." Tr. 42-43. But this was merely an affirmation of her belief. No explanation was offered of how such an adverse effect could occur.

At the conclusion of her direct testimony, Ms. Frompovich was again asked to state her “opinion regarding the effect of the Smart Meter on your health.” Tr. 65. She replied that she has a network of people with whom she discusses AMI issues, and then stated, Tr. 66:

And this is how I am able to ascertain, come to conclusions, and deal with my specific – as a matter of fact when I was diagnosed and sent out on my network, I got all kinds of help, information, etc. So, based upon my expertise and these people across the table from me who know nothing probably about holistic health, natural nutrition, and natural healing modalities.

So I, in my opinion, feel that they are not even qualified to cross-examine me because they don’t have an expert here in that field, Your Honor. So, therefore, my conclusion is this. I rest my case.

After cross-examination was complete, Administrative Law Judge Heep attempted again to elicit a statement of Ms. Frompovich’s opinion, requesting that she “focus on how it relates to you and your health personally.” Tr. 96. Ms. Frompovich and ALJ Heep had the following discussion, Tr. 97:

Ms. Frompovich: Because I am an electromagnetic being with a brain that is the central computer of the central nervous systems, those waves will interfere with and affect my DNA, my blood cells, and entire biology and physiology; and that is unreasonable. That is also the equivalent of an experiment on me that I have not given permission to anyone.

ALJ Heep: And how is that connected to your recovery or treatment or the cancer that you had? I just need you to articulate for me the connection.

Ms. Frompovich: It will probably, if I get an AMI on, it probably will induce a recurrence which I’m not interested in having. I’ve spent a lot time, a lot of money because I’m going to tell you something. My alternative cancer treatments were not paid for by any insurance policy, and I am insured to the hilt. I had to pay out of pocket for them.

PECO respectfully submits that this testimony, taken as a whole, does not constitute substantial evidence, medical or otherwise, that PECO’s AMI meter will cause harm to Ms. Frompovich. It is obvious that Ms. Frompovich sincerely believes that her health will be harmed by an AMI – but her subjective belief is not proof. Her testimony, even if taken as true and

given full weight, only establishes that *she believes* that the AMI meter will cause her harm. That is simply insufficient evidence for the Commission to conclude that the AMI meter in fact *will* cause her harm.

Ms. Frompovich's reliance upon her documentary exhibits does not lend any greater weight to her testimony. PECO's experts gave testimony on some of those studies, and that testimony is discussed in later sections of this brief. Focusing solely on Ms. Frompovich's use of those documents, however, is also telling. As to these studies, for example, she stated that she relied upon studies without reviewing them in their entirety. Tr. 83. She stated that she did not determine the authorship of studies before relying upon them. Tr. 84. She introduced a study to support her view that radiofrequency fields cause non-thermal effects that cause cancer, even though that study stated exactly the opposite: "Evidence to support a causal relationship between exposure to RFR, radiofrequency radiation, and human cancers is scant. Our present state of knowledge about exposure, mechanisms, epidemiology, and animal studies does not identify significant cancer risks." Tr. 86-87.

PECO also notes that Ms. Frompovich materially relied upon her Exh. R-1, which was a 3-page excerpt from the BioInitiative 2012 report. This report was edited by Dr. David Carpenter. Tr. 89. Her reliance on Dr. Carpenter's work is problematic. Dr. Carpenter appeared as an expert witness before this Commission in the PPL *Susquehanna-Roseland* transmission line siting case (Docket No. A-2009-2082652). In that proceeding, the Commission rendered the following extremely negative judgement of Dr. Carpenter's scientific approach (Jan. 14, 2010 Order, pp. 111-14):

[The ALJ found that] [t]he record evidence shows that Dr. Carpenter's opinions were flawed and were not based on a reliable and objective review of the

scientific research. . . In light of this overwhelming evidence, there is no good basis to give any weight to Dr. Carpenter's extreme views.

* * *

We agree with the ALJ regarding the testimony of the SCECA witness Dr. Carpenter. When the record is viewed in its entirety it is clear that Dr. Carpenter's testimony is his largely unsubstantiated (albeit heartfelt) opinion that EMF poses a health threat at any level.

When Dr. Carpenter himself appeared before this Commission and was subjected to cross-examination, his "extreme views" were given no weight. Ms. Frompovich relied upon his scientific approach in forming her opinion. Her opinion should be given no greater weight than the Commission gave to Dr. Carpenter's opinion when he appeared in person.

Finally, PECO notes that Ms. Frompovich wrote a book, titled "The Cancer Answer," detailing the natural healing method that she used to treat her own breast cancer. Tr. 91-93, PECO Cross-Examination Exhibit 3. In that book, Ms. Frompovich discusses her core natural healing modality that involves supplements, exercise, nutrition, etc. In one chapter, she discusses additional steps that might be considered beyond those core modalities, including avoiding electromagnetic fields from cell phones, computer terminals, television screens, and other devices. The chapter is titled: "Off the Wall Stuff."

In sum, Ms. Frompovich's testimony, even if taken as true, does not provide a substantial medical evidentiary basis for finding that PECO's AMI meters interfere with her ability to heal and to live cancer free because it only articulates her belief, not medical evidence to support that belief. That evidentiary defect is not resolved by her reliance on documents as described above.

II. PECO presented substantial, persuasive expert testimony that demonstrates that its AMI meters will not interfere with Mr. Frompovich's ability to heal or live cancer free

As noted above, the Commission has already ruled in this proceeding that Ms.

Frompovich has the burden of proof. When her limited testimony is viewed in the context of the evidence adduced by PECO, it is absolutely clear that Ms. Frompovich failed to demonstrate, by a preponderance of the evidence, that PECO's AMI meter would interfere with her healing or ability to live cancer free (or that its AMR meter caused or contributed to her breast cancer).

On these issues, PECO sponsored the testimony of two eminent scientists – Dr. Christopher Davis, and Dr. Mark Israel – and of a PECO engineer with expertise in the design and operation of the advanced meter system, Mr. Glenn Pritchard.

A. Dr. Christopher Davis is a physicist and engineer and is an expert in physics, biophysics, electrical engineering, electromagnetics and radio frequency exposure and dosimetry

Dr. Christopher Davis is a Professor of Electrical and Computer Engineering at the University of Maryland. Tr. 184. He has a PhD in physics from the University of Manchester (England). Tr. 184. He regularly teaches electromagnetics, including issues to do with radiofrequency waves. Tr. 185. He has conducted research on electromagnetics, including radio frequency phenomena and devices, Tr. 186, and has published hundreds of papers and presentations presenting the results of his research. Tr. 187. He has been elected as a fellow of the Institute of Electrical & Electronics Engineers ("IEEE"), and as a fellow of the Institute of Physics. Tr. 186. In his work with IEEE, he served as a member of the Committee on Man and Radiation ("COMAR"), and was chair of the COMAR subcommittee on radio frequency fields. Tr. 187-88. He regularly acts as a peer reviewer for journals on issues related to

electromagnetics. Tr. 188. He has served as a consultant on radiofrequency fields to the United States Institutes of Health, the U.S. Food and Drug Administration, and United Kingdom Health Protection Agency. Tr. 189. At the hearing, he was recognized, without objection, as an expert in physics, biophysics, electrical engineering, electromagnetics and radiofrequency exposure and dosimetry. Tr. 189.

1. Dr. Davis demonstrated that the radiofrequency fields from PECO's AMI meter are well below the radiofrequency exposure guidelines of the U.S. Federal Communications Commission and the International Commission on Non-Ionizing Radiation Protection

Dr. Davis testified, Tr. 135-36, that the Federal Communications Commission ("FCC") has established a "Maximum Permissible Exposure," or "MPE," for radiofrequency fields from AMI meters. Tr. 201. The limit is 0.6 mW/cm^2 , or "milliwatts per square centimeter." Tr. 207, PECO Exh. CD-2. The FCC standard was set on the following basis: there is one generally accepted mechanism by which radiofrequency fields can cause harm to humans – by being high enough to heat tissues. Tr. 202-03. The FCC determined the lowest level of radiofrequency exposure at which animals have been observed to detect that they are feeling a little bit warm in a radiofrequency field. Tr. 203. The FCC then set the radiofrequency exposure standard at a level 50 times below that thermal threshold. Tr. 203. In establishing and maintaining these standards, the FCC consults closely with the Food and Drug Administration, the Occupational Safety and Health Administration, and the National Institutes of Occupational Safety and Health. Tr. 203.

Dr. Davis testified that the average exposure from an AMI meter is "incredibly small" – many millions of times less -- compared to the FCC standards. Tr. 207. Even at *peak* exposure, the radiofrequency fields from an AMI meter are over 35 times smaller than the FCC *average-exposure* standards. Tr. 209.

Dr. Davis also testified that, internationally, the radiofrequency exposure guideline are set at levels somewhat lower than the FCC Maximum Permissible Exposure levels. These guidelines were issued by the International Committee on Non-Ionizing Radiation Protection, or “ICNIRP.” Tr. 211. Dr. Davis testified that radiofrequency exposure from an average PECO AMI meter are millions of times smaller than allowed under the international standards. Tr. 211.

2. Dr. Davis demonstrated that PECO’s legacy AMR meters, which have been in place since the early 2000s, have radiofrequency fields that are substantially higher than AMI meters

PECO’s existing meter system, which uses AMR meters, also communicates using radiofrequency transmissions. Dr. Davis compared the radiofrequency exposure from the existing AMR meters to the radiofrequency exposure from the new AMI meters. Tr. 215, PECO Exh. CD-7. He concluded that the AMR meter, which Ms. Frompovich currently has, provides 6.4 times more radiofrequency exposure than would be the case if the AMI were installed. Tr. 215.

3. Dr. Davis demonstrated that radiofrequency exposure from PECO’s AMI meter is far less than people experience from other sources in everyday life

Dr. Davis also compared the radiofrequency exposures from PECO’s AMI meters to the radiofrequency exposures that people experience in their everyday life. Tr. 212-217, PECO Exh. CD-5. He stated that “we live in a wireless world these days. There’s all sorts of radiofrequency radiation. It’s an inevitable part of modern living.” Tr. 212. Dr. Davis began by noting that the limits for allowable leakage from a microwave oven ($5\text{mW}/\text{cm}^2$) are nearly 300,000 times the exposure from a PECO AMI meter. Tr. 212, PECO Exh. CD-5. Exposure when using a cell phone is millions of times higher than from an AMI meter. Tr. 213. Dr. Davis discussed typical

exposure from standing 30 feet away from someone else using a cell phone, and noted that even this common experience results in exposure that is 5,700 times greater than from an AMI meter.

Tr. 212. Television broadcasters continue to broadcast using radiofrequency fields, and at Ms. Frompovich's home, the background radiofrequency fields from UHF television broadcasting are 998 times larger than the average exposure from an AMI meter. Tr. 214. Although Ms. Frompovich has reduced her cell phone usage to only about 10 minutes per month, her cell phone usage over the last six months exposed her to more radiofrequency fields than she will be exposed to from an AMI meter in over 900 years. Tr. 215.

Based on all of his testimony, Dr. Davis concluded, to a reasonable degree of scientific certainty, that "AMI meters are incapable of causing any biological effects, certainly no adverse biological effects, in anybody." Tr. 216.

4. Dr. Davis and Mr. Pritchard established that PECO's AMI meters do not create "dirty" electricity or use pulsed communication

As noted in earlier in this brief, Ms. Frompovich expressed concern that PECO's AMI meters will create "dirty" electricity. She expressed a similar concern that the system uses "pulses" to communicate.

Both Dr. Davis and Mr. Pritchard² addressed these concerns. They stated that "dirty" electricity is not a scientific term. Tr. 140, 198. The concept, however, refers to the fact that "harmonics" exist on the electric system. These harmonics can be thought of as disruptions to the normal sinusoidal 60 Hz wave form of electricity. Tr. 140, 198. Disruptive harmonics are inevitable because nearly all of the electricity that we generate is produced by rotating machinery, which introduces disruptive harmonics. Tr. 199. In addition, harmonics are created

² Mr. Pritchard's qualifications are discussed in a later section of this Brief.

by the earth's magnetic field, interruptions from the sun, and any device that is plugged into electric system, including fluorescent lights, devices that have power supplies, computers, cell phone chargers, and refrigerators. Tr. 140-41.

The AMI meter, however, is an extremely light user of electricity and therefore an AMI either produces no harmonics or harmonics of such small magnitude that they do not meaningfully contribute to the overall harmonics and disruption of the sinusoidal wave. Tr. 142, 200.

A home that does not have an AMI meter will still have significant disruption of the sinusoidal wave, even if the resident of that home has eliminated microwaves and other sources of radiofrequency fields. Tr. 142-43. Similarly, a home with an AMR meter will have significant disruption of the sinusoidal wave. Tr. 171. The bottom line is that, while harmonics exist on the electric system at all times, the type of meter being used at the home – AMI, AMR, or even analog – is not a material contributor to the amount of harmonic distortion. Changing the meter type will not change the amount of harmonic distortion.

Ms. Frompovich also expressed concern that the PECO system uses “pulses” or “pulsed communication,” which she believes is particularly dangerous. Both Dr. Davis and Mr. Pritchard stated that PECO's AMI meters do not use pulsed transmissions. Tr. 173, 200.

B. Dr. Mark Israel is a medical doctor and is an expert in whether there is a relationship between electromagnetic fields, and particularly radiofrequency fields, and health effects

Dr. Mark Israel is a medical doctor who was educated at Albert Einstein College of Medicine and trained at Harvard Medical School. Tr. 254. He is licensed to practice medicine, Tr. 254, and treats patients. Tr. 255. He has taught medical students, interns, and medical residents for more than 25 years. Tr. 256. He has worked over the years at the National

Institutes of Health (at both the National Institute of Allergy and Infectious Disease and the Molecular Genetics Section of the National Cancer Institute) and at the University of California Medical School in San Francisco. Tr. 255.

He has held positions as Professor of Genetics and Pediatrics at Dartmouth Medical School. He also has been the Director of the Dartmouth Cancer Center, teaches medical school at Dartmouth, has a research laboratory at Dartmouth, and has been the chief administrator of the cancer center. Tr. 255. He has published more than 200 scientific papers reporting the results of his research. Tr. 257. He first became interested in studies regarding exposure to electromagnetic fields and health more than 25 years ago when, as a practicing pediatric oncologist, parents raised questions regarding exposure of their children to electromagnetic fields from power lines. He has remained interested in, and followed, the field since that time. Tr. 258. Dr. Israel is an elected member of the American Association for the Advancement of Science and American Society of Clinical Investigation. Tr. 257. He has received the C. Everett Koop Medal of Courage for work in evidence-based medicine, and has been awarded the United States Public Health Service Commendation Medal. Dr. Israel was recognized, without objection, as an expert in the fields of medicine and medical research, including cancer, and the possible health effects of electromagnetic fields including power frequency fields and radiofrequency fields. Tr. 259-60.

- 1. Dr. Israel reviewed the scientific literature on radiofrequency fields and health and concluded that there is no reliable medical basis to conclude that radiofrequency fields associated with AMI devices could cause, contribute to or aggravate any health effects**

Dr. Israel stated that he conducted a medical evaluation of whether radiofrequency fields cause, contribute to, or could exacerbate the conditions that Ms. Frompovich identified in this

case. Tr. 260. Dr. Israel conducted that evaluation in the same manner as he would routinely do an evaluation in his medical practice – that is, he searched databases to identify the relevant studies and then examined those studies; and also considered reviews of the research by public health agencies. Tr. 260-61. In doing that review, he considered both the studies that showed an effect and the studies that did not show an effect, because a reliable medical evaluation requires review of all the studies. Tr. 261. He also identified and reviewed reports by various public health agencies, primarily to determine whether he had missed any key research and to determine whether there a consensus opinion that contradicted his own views. Tr. 262.

Dr. Israel noted that, in reviewing this research, he differentiated between claimed reports of a biological effect – which is any response to an exposure – and a health response, which is when a biological effect leads to injury or illness. Tr. 262. His review included studies that have much higher exposure than one would expect from smart meters because if one does not see a response at a high exposure, one would not expect to see it at a lower exposure, which is known as dose-response. Tr. 263. He reviewed epidemiological studies (reviews of human populations), cellular or “in vitro” studies, and animal or “in vivo” studies. Tr. 264-65. He reviewed the studies both for effects and consistency of reported effects, because it is important that an effect be reproducible in multiple studies in order to accept its validity. Tr. 265.

Dr. Israel’s review of the scientific research on claimed health effects such as breast cancer is discussed in the next section of this brief. However, in addition to that symptom-specific review, he also reviewed the overall conclusions of public health agencies.

In his review of public health agencies, Dr. Israel first addressed reports on smart meters issued by state health agencies. A 2014 a report from the Arizona Department of Health, Office of Environmental Health concluded that: “Exposure to electric meters, AMI or AMR, is not

likely to harm the health of the public.” Tr. 288. Similarly, in 2010, the Maine Center for Disease Control found: “In conclusion, our review of these agency assessments and studies do not indicate any consistent and convincing evidence to support a concern for health effects related to the use of radio frequency and the range of frequencies and power used by Smart Meters.” Tr. 289. In 2015, the North Carolina Department of Health and Human Services concluded: “Health effects evaluated included cancer, reproductive effects, cellular effects, neurological behavioral effects and electromagnetic sensitivity. This is insufficient evidence to link RF exposures to adverse health outcomes.” Tr. 289-90. In 2012, the Vermont Department of Health similarly concluded: “After extensive review of the scientific literature available to date and current FCC regulatory health protection standards, we agree with the opinion of experts: (1) the thermal health effects of radio frequency are well understood and are the current basis for regulatory exposure limits. These limits are sufficient to prevent thermal health effects; and (2) non-thermal health effects have been widely studied, but they are still theoretical and have not been recognized by experts as a basis for changing regulatory exposure limits. The Department of Health in Vermont has concluded that the current regulatory standards for radio frequency from fields from Smart Meters are sufficient to protect the public health.” Tr. 290-91.

Dr. Israel then reviewed the publications of international public health agencies. The World Health Organization, in a 2014 Report, stated that: “A large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse health effects have been established as being caused by mobile phone use.” Tr. 291. A 2013 Report of the Royal Society of Canada Expert Panel concluded: “The panel concluded that the balance of evidence at this time does not indicate negative health effects from exposure to RF energy below the limits recommended by the safety code.” Tr. 292. A 2012

report of the Independent Advisory Group of the United Kingdom Health Protection Agency concluded: “In summary, although a substantial amount of research has been conducted in this area, there is no convincing evidence that RF field exposure below guideline levels causes health effects in adults or children.” Tr. 292. A 2012 report from the Norwegian Institute of Public Health concluded: “The large total number of studies provides no evidence that exposure to weak RF fields causes adverse health effects.” Tr. 292-3. A 2015 report of the New Zealand Ministry of Health concluded that: “While a great deal of research has been carried out to investigate the potential effects of exposures to radio frequency fields on health, particularly exposures associated with cell phone use, there are still no clear indications of health effects caused by exposures that comply with the limits in the New Zealand RF field exposure standard.” Tr. 293.

Based on his overall review, including both the public health agency publications and the research on specific health outcomes further discussed in the next section of this brief, Dr. Israel concluded: “My overall medical opinion is that exposure to radiofrequency fields from PECO’s instruments, either the AMR or the AMI meters, have not [been] and will not be harmful to Ms. Frompovich.” Tr. 294.

- 2. Dr. Israel reviewed the scientific studies on radiofrequency fields and health and concluded that there is no reliable medical basis to conclude that radiofrequency fields associated with AMI devices could cause, contribute to, or aggravate the specific health effects Ms. Frompovich testified were of concern to her, including breast cancer**

Dr. Israel began his review of specific claimed health issues with an evaluation of the studies of whether exposure to radiofrequency fields can cause the occurrence or recurrence of breast cancer. He discussed large animal studies in which no association or enhanced occurrence of breast cancer was found after radiofrequency exposure. Tr. 266. He discussed several large epidemiology studies, one of which looked at 420,000 subjects and another of which looked at

700,000 subjects, which did not find any association between radiofrequency field exposure and breast cancer. Tr. 267. He concluded that exposure to radiofrequency fields from either AMR or AMI meters would not contribute to or cause the occurrence or recurrence of Ms. Frompovich's breast cancer. Tr. 268. On further examination by Administrative Law Judge Heep, Dr. Israel stated that radiofrequency fields would not interfere with the body's ability to heal. Tr. 323.

With respect to cancer, Dr. Israel also discussed the International Agency for Research in Cancer ("IARC"), which Ms. Frompovich discussed in her testimony. The IARC has designated radiofrequency fields as a class 2B "possible" carcinogen. Dr. Israel explained the meaning of that classification: "That's a category in which the data that's available is limited and one cannot distinguish as to whether the data claiming an association is determined, and this is a quote [from the IARC publications], 'by chance, bias or confounding.'" Tr. 283. Dr. Israel also noted the "2B" classification only applies to specific brain tumors, and does not apply to breast cancer. Tr. 283.

Dr. Israel also reviewed a letter from the American Association of Environmental Medicine that Ms. Frompovich discussed in her testimony. He concluded that the letter "advocates for an opinion that is not consistent with the mainstream of thought in this area." Tr. 285.

Finally as to cancer, Dr. Israel reviewed information from the National Toxicological Program that was discussed in Ms. Frompovich's testimony. He stated that he is aware of this program and its ongoing research, but that the research "is incomplete, partial, [and it is] premature to have an opinion on it." Tr. 286.

Dr. Israel also reviewed the scientific research on radiofrequency fields and the immune system, looking at both animal and human studies. Tr. 268-69. He concluded that there is no basis to consider that radiofrequency fields could affect the immune system. Tr. 269-70.

Dr. Israel also reviewed the research on claims of electromagnetic hypersensitivity (“EHS”), which is also known as “Idiopathic Environmental Intolerance” (“IEI”). Tr. 271-74. He reviewed studies known as “provocation” studies, in which a subject is asked to determine, in a controlled laboratory setting, whether they are being exposed to radiofrequency fields – and researchers consistently find that the subjects cannot determine whether they are in a radiofrequency field, or not. Tr. 275-78. He then reviewed the findings of numerous public health agencies, including the World Health Organization, the United Kingdom Health Protection Agency, the Royal Society of Canada, the New Zealand Ministry of Health, and the European Community’s Scientific Committee on Emerging and Newly Identified Health Risks, all of which concluded that exposure to radiofrequency fields does not cause EHS or IEI. Tr. 278-282. Based on this review, he concluded that there is no scientific basis for concluding that radiofrequency fields from PECO’s AMR or AMI meters can cause, contribute to, or exacerbate the conditions or symptoms associated with claims of electrical hypersensitivity. Tr. 283.

Dr. Israel also testified that there is no scientific basis for concluding that exposure to radiofrequency fields would increase stress. Tr. 325.

C. Glenn Pritchard is an electrical engineer and an expert in the design, operation, and technology of advanced grid installations

Glenn Pritchard is PECO’s Manager of Advanced Grid Operations and Technology Group. Tr. 93. Before that he was the principal engineer of PECO’s Smart Grid Project. Tr. 126. For the past eight years, he has focused on AMI technology, and he selected the technology that was ultimately deployed by PECO. Tr. 126. He has a degree in electrical engineering, and

is a licensed professional engineer. Tr. 125. He has been invited to make presentations about AMI meters by the Institute of Electrical & Electronics Engineers, the Edison Electric Institute, and the Electric Power Research Institute. Tr. 126-27. He has spoken about AMI meters on behalf of the United States Trade & Development Agency, giving invited presentations in South Africa, Vietnam, and Turkey, amongst others. Tr. 127-28. He was recognized, without objection, as an expert in the design, operation, and technology of advanced grid installations. Tr. 128-29.

1. Mr. Pritchard testified that PECO's AMI Landis + Gyr meters have not caused fires

During the hearing, Ms. Frompovich stated that she had read reports that AMI meters had caused fires, and expressed concern that this would happen at her home. This was addressed by Mr. Pritchard. He stated that when PECO first began to install AMI meters, the question was raised as to whether a particular brand of meter was associated with fires. PECO recognized this issue, investigated, and concluded that it would no longer use that brand of meters. Tr. 143. PECO removed all such meters and replaced them with Landis + Gyr meters in 2012. Tr. 143. There have been no reports of fires caused by the Landis + Gyr meters. Tr. 143-44.

Mr. Pritchard also demonstrated, at some length, the method that PECO used to ensure that its AMI meters comply with Underwriters' Laboratory standards. Tr. 158, 173-75.

III. PECO offers its customers, including Ms. Frompovich, reasonable alternatives regarding AMI meter installation

In remanding these AMI/health cases for hearings, the Commission has raised the question of whether PECO can offer some accommodation or alternative to customers, such as Ms. Frompovich, who have concerns about AMI meters. In its January 28, 2016 *Kreider* Order,

the Commission elaborated on the kinds of accommodations or alternatives that might be possible, stating (p. 23) that: “It may be possible, for example, for the Respondent to install the smart meter in a different location other than outside of the Complainant’s bedroom or to use a different type of smart meter at this Complainant’s home.”

As to installation of the smart meter in a different location, Mr. Pritchard testified that under PECO’s Tariff, Rules 3.2 and 3.4, PECO Exh. GP-3, Tr. 111-12, the customer has the option of relocating the meter to a different location. This is because, while PECO chooses the type of meter, *the customer chooses the location of the meter board and socket*. Tr. 144-45, PECO Exh. GP-3. If the customer would like a different location for the AMI meter, they can hire an electrician to move the meter board/socket to a new location on their property. This will, in some situations, require work on the PECO system as well to extend its conductors to the new meter board location. PECO would view such changes to its system to be “for the accommodation of the customer” and thus, under PECO’s Tariff Rule 6.2, the customer would be responsible for the cost of the changes to the PECO system. But those changes are all within the control of the customer and, once they are made, PECO would install the AMI meter at the new, customer-chosen, location.

Prior to hearing, PECO’s counsel phoned Ms. Frompovich to discuss this option, but Ms. Frompovich hung up on her. Tr. 73-74. This option was investigated again at the hearing, but Ms. Frompovich will not accept any option to relocate the AMI meter to a new location because, in her opinion, an AMI meter will send dirty electricity into her house regardless of its location. Tr. 59-60, 74-75.

PECO notes that this option remains open and, if Ms. Frompovich wishes to explore this option, PECO will field one of its engineers to review whether alternative locations are available.

As to installing a “different type of smart meter,” PECO’s Tariff has a provision that allows third parties to come onto its system and provide such technology, on a competitive basis. Rule 14.1 allows for an Advanced Meter Services Provider (“AMSP”) to provide Advanced Metering Services, which presumably may, in the future, include “different types of smart meters.” Tr. 145, 167, PECO Exh. GP-3. Currently, no AMSPs are licensed by the Commission to do business. Tr. 145. However, if the market develops and makes such meters available, then PECO’s Tariff already contains a provision that allows for such meters to be deployed, subject to the third party being licensed by the Commission, the meters meeting the requirements of Act 129, and the AMSP’s services being properly integrated into PECO’s computer systems.

At the end of the day, however, it is clear that the only accommodation that will satisfy Mr. Frompovich is to not have a smart meter at all. And that option is not available. As Your Honors wrote in your April 5, 2016 *Order Granting in Part and Denying in Part Respondent’s Preliminary Objections* in *Tucker v. PECO*, C-2015-2515592 (p. 5):

Relief sought by the [Complainants] includes an “opt out” of installation of a smart meter. The Commission has stated that there is no provision in the Code, the Commission’s Regulations or Orders that allow a PECO customer to “opt out” of smart meter installation.

In sum, PECO has offered reasonable alternatives for location and alternative providers of metering technology.

IV. State public utility commissions that have examined whether AMI meters cause or contribute to health effects have concluded that AMI meters are safe and that their use is reasonable

This is one of a series of seminal cases in Pennsylvania that allow an evidentiary examination of whether radio frequency fields from AMI meters cause or contribute to adverse

health effects. PECO notes, however, that there have been numerous evidentiary investigations into that or similar issues conducted by state utility commissions in the United States. Those other state commission investigations variously concluded that radiofrequency fields from smart meters fall well under established guidelines, are not a threat to human health, and do not warrant additional state utility commission regulation – in other words, that the use of such meters is reasonable. Specifically, PECO is aware of the following investigations and conclusions from other state commissions:

- California Public Utilities Commission, Application of EMF Safety Network for Modification of D.06-07-027 and D.09-03-026, December 6, 2010: "In summary, the RF emissions produced by Smart Meters is extremely small in comparison to the RF emissions from many other commonly used devices and far below emission standards set by the FCC, which licenses or certifies the Smart Meters used by PG&E. Since the Commission generally does not delve into technical matters which fall within the expertise of another agency, in this case we defer to the FCC, which possesses extensive expertise on its staff for evaluating and licensing or certifying Smart Meter devices that operate via the use of wireless technology."
- District of Columbia Public Service Commission, Investigation Into PEPCO's Smart Meters. September 20, 2013: "... the Commission has found no credible, scientific evidence to show that the level of RF emissions from the Pepco smart meters is a threat to human health."
- Florida Public Service Commission, Smart Meter Briefing Sheet (undated): "The Commission concluded that health standards for smart meter RF emissions are set by the FCC, that smart meters operate within established authorized standards, and that the State would not implement any additional standards for smart meter RF emissions."
- Maine Public Utilities Commission, Request for Commission Investigation into Smart Meters and Smart Meter Opt-Out, Docket No. 2011-00262, March 25, 2014: "For the reasons discussed in this Order, we conclude that Advanced Metering Infrastructure (AMI), including the use of "smart meters," as implemented and operated by Central Maine Power Company (CMP or the Company), is a safe, reasonable, and adequate utility service as required by statute." [The reasons discussed in the Order include the following.]

- i. "There are no credible, peer-reviewed scientific studies in the record that demonstrate, or even purport to demonstrate, a direct human health risk specifically from smart meter RF emissions;"
 - ii. "CMP's installation and operation of its smart meter system is consistent with federal and state energy policy and is a generally accepted utility practice throughout the country."
- Maine Public Utilities Commission, Request for Investigation Into Smart Meters and Smart Meter Opt-Out; Request for Commission Investigation into Central Maine Power Company and Smart Meters, December 19, 2014: "As discussed in this Order, we find that Advanced Metering Infrastructure (AMI), including the use of "smart meters," as implemented and operated by Central Maine Power Company (CMP or the Company), does not present a credible threat to the health and safety of CM P's customers and, based on the record of this proceeding is, therefore, safe."
- Massachusetts Department of Public Utilities, Investigation by the Department of Public Utilities on its Own Motion into Modernization of the Electric Grid, June 12, 2014: "[A]fter thorough review and consideration of the issue, the Department is unaware of any credible, peer-reviewed scientific studies that demonstrate a direct human health risk from exposure to the low-level RF signals from advanced meters."
- Michigan Public Service Commission, U-17000 Report to the Commission, June 29, 2012: "After careful review of the available literature and studies, the Staff has determined that the health risk from the installation and operation of metering systems using radio transmitters is insignificant. In addition, the appropriate federal health and safety regulations provide assurance that smart meters represent a safe technology"
- Nevada Public Utilities Commission, February 9, 2012: "Smart meters meet the FCC emission standards and the RF emissions from smart meters are far lower than the FCC guidelines The FCC has taken a very conservative approach to RF exposure compliance for low-power network devices such as smart meters. The FCC 'is continually monitoring the issue of RF exposure and related health and safety concerns, both in general terms of the continuing propriety of its regulations, and in individual cases where substantive concerns are raised."
- New Hampshire Public Utilities Commission, Joan Wirth Request for Hearing on Installation of Smart Meters, Order Denying Hearing Request, September 6, 2012. "Based on this product information, we find that the NHEC basic, or standard, smart meters meet applicable FCC RF exposure limits. Having determined that the NHEC basic, or standard, smart meters meet FCC limits for exposure to RF radiation, we must consider whether we need to accept the FCC limits on

exposure to RF radiation or seek other guidance on the health and safety of the Elster Type R2S meters."

"Having determined that NHEC's meters meet the FCC RF emissions limits, we will not explore a separate state standard for RF emissions because we find that the FCC limits pre-empt a separate and potentially conflicting state standard."

- Public Utility Commission of Texas, Report on Health and Radiofrequency Electromagnetic Fields from Advanced Meters: September 6, 2012: "Staff has determined that the large body of scientific research reveals no definite or proven biological effects from exposure to low-level RF signals. Further, Staff found no credible evidence to suggest that advanced meters emit harmful amounts of EMF."
- Vermont Department of Public Service, An Evaluation of Radio Frequency Fields Produced by Smart Meters Deployed in Vermont, January 14, 2013: "The FCC MPE values were derived with the inclusion of a safety factor of 50 below the actual threshold of hazard from prolonged exposure. When the above estimated RF field exposures for GMP and BED meters at the closest distance of one foot are considered in this light, this means that the most conservative estimates of potential exposure range between approximately 75,000 and 156,000 times less than the hazard threshold respectively."

"Using the highest indicated results from the measurements performed in this study, potential exposure of individuals to the RF fields associated with the currently deployed smart meters in the GMP and BED service territories is small when compared to the limits set by the FCC. It is concluded that any potential exposure to the investigated smart meters will comply with the FCC exposure rules by a wide margin."

V. Conclusion

PECO respectfully submits that, on the record evidence in this proceeding, the Commission should follow the lead of the other state commissions and conclude that there is no reliable medical basis to conclude that radio frequency fields associated with AMI devices could cause, contribute to any health effects or exacerbate any symptoms, including Ms. Frompovich's breast cancer. PECO therefore submits that the Commission should conclude that the use of an AMI meter to provide service to Ms. Frompovich is reasonable utility service for purposes of 66 Pa. C.S. §1501.

Proposed Conclusions of Law

1. The Commission has jurisdiction over the parties and the subject matter of this proceeding. 66 Pa.C.S. § 701.
2. The Complainant must establish her case by a preponderance of the evidence. *Samuel J. Lansberry, Inc. v. Pa. Pub. Util. Comm'n*, 578 A.2d 600 (Pa. Cmwlth. 1990), alloc. den., 602 A.2d 863 (Pa. 1992).
3. The complainant has not met her burden of proof of establishing an offense in violation of the Public Utility Code, the Commission's regulations or an outstanding order of the Commission. 66 Pa.C.S. § 701.
4. PECO did not provide unsafe or unreasonable service in violation of 66 Pa.C.S. § 1501.
5. A utility may issue written notification of termination to a customer if a customer does not permit access to meters, service connections or other property of the public utility for the purpose of replacement, maintenance, repair or meter reading, including the installation of AMI meter. 52 Pa.Code § 56.81(3).

Conclusion and Proposed Ordering Paragraphs

For the reasons set forth above, PECO respectfully requests that the Commission issue an Order in this proceeding that states:

1. That the Complaint is dismissed;
2. That PECO may install an AMI meter at the Frompovich residence; and
3. That if Ms. Frompovich denies access for the purpose of installing an AMI meter, or subsequently removes or modifies the AMI meter, PECO may after appropriate notice terminate electric service to her residence.

Respectfully submitted,



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