May 30, 2024

VIA ELECTRONIC DELIVERY

Administrative Law Judge Mary D. Long
Pennsylvania Public Utility Commission
Pittsburgh District Office Piatt Place, Suite 220 301 5th Street
Pittsburgh, PA 15222
malong@pa.gov

Re: Deborah Engisch-Platt and Kim Platt v. Metropolitan Edison Company
Docket No. C-2019-3013745

Dear Judge Long:

Enclosed please find the Surrebuttal Testimony Of Deborah Engisch-Platt And Kim Platt countering the Rebuttal Testimony of Mr. David R. Villao of First Energy Pennsylvania Electric Company, Met Ed.

Respectfully Submitted,

Kim Platt and Deborah Engisch-Platt
riversong3@comcast.net

CERTIFICATE OF SERVICE

Surrebuttal Testimony has been served on: James Austin Meehan
Surrebuttal Testimony has been served on: Daniel A. Garcia
Surrebuttal Testimony has been served on: Tori L. Giesler
Surrebuttal Testimony has been served on: MET ED.

jameehan@firstenergycorp.com
dagarcia@firstenergycorp.com
tgiesler@firstenergycorp.com

SURREBUTTAL

SURREBUTTAL - Page 3, Section II:

1) There is nothing in Act 129 that forcibly requires smart meters to be deployed. In fact, any reasonable person can understand by reading it, that Act 129 was intended as an opt-in-measure.

However, PUC's and Met Ed's callous determination to place an unsafe smart meter on the Platt's and other customer's homes, has shifted public perception from viewing Met Ed power company as benign entity to that of a company that disregards the health and wellbeing of their customers.

The best truthful and cogent arguments elocuting the fact that Act 129 Is not a smart meter mandate can be elucidated by the briefs of Wes Zimmerman and Holder's Reply Exceptions.
{SEE BOTH EXHIBITS OF WES ZIMMERMAN BRIEF AND HOLDER'S REPLY EXCEPTIONS}.

2) Response to page 4, last paragraph:

The only way the utility "must furnish a smart meter to customers" is by breaking the following laws:

PA TITLE 66/1501, The Federal Americans with Disabilities Act, the Fair Housing Act, Public Law

90-602 and Section 804 (b) or(f) of Title VIII of the Civil Rights Act of 1968, as amended in 1988, 42U.S.C. 3601 et.seq. See EXHIBIT: HUD SMART METER SETTLEMENT.
Given the settled science of the health dangers of smart meters, the utility companies, The PUC, Administrative Law Judges and the individual employees involved in such operations are liable for complex litigation/Toxic Tort lawsuits and this document serves as Notice of Liability of same.
It should be noted that the Commonwealth of Pennsylvania is the only state to force customers to become sick from smart meters.

3) Response to pages 6-8:

Pages 6 through 8 itemizes the questionable relationship among the utility companies, the PUC and, by logical extension, the Administrative Law Judges. The utility companies even pay one percent (1%) of their net profit to the PUC. The Commission hires the ALJ judges, pays their salaries and restricts the rights of the complainants per court rules, which shall become evident subsequently in this brief.
In its intrinsic corruption, Met Ed tries to conceal the fact that Kim and Deborah Platt won against summary judgment brought by Met Ed. In a true anomaly, ALJ Joel Cheskin possessed a moral compass.

A document in the National Review is entitled," Challenging the Excessive Rules of an Administrative Law Court." The National Review states, "At least one form of government abuse might end soon.

The US Supreme Court heard oral arguments this term for Securities and Exchange Commission v. Jarkesy, which challenges the unlawful powers wielded by Administration Law Courts. These are courts inside agencies that do not afford civilians the same protections as independent courts.

The ALC Defendants typically do not get the right to a jury trial. The judges are employed by the agency that also pays their salaries. The agency also sets the ALCs' procedural rules, has different evidence - sharing standards that favor the agency and stacks the deck against defendants in ways regular courts never could….

The Jarkesy case challenges some of these excesses. The Supreme Court already ruled unanimously against the SEC and FTC's ALC's in Axon v. FTC (2023). The 5th Circuit Court issued a 2- 1 ruling in Jarkesky's favor, asserting that the SEC's ALJ's violated three provisions of the Constitution…."

Judges possess immunity unless they are out of their jurisdiction.
See Stump v. Sparkman 98 S. Ct. 1099(1978). It should be self-evident that---given the aforementioned excessive powers and abuses of ALCs as well as US Supreme Court rulings, any Administrative Law Judge making decisions about a complainant's grave health consequences from a forced smart meter is out of her jurisdiction----thereby lacking immunity and potentially liable for a toxic tort action.

Response to page 9:

There are 20,000 studies proving that smart meters emit dangerous levels of radiation as well as damaging levels of conducted emissions. Some of these scientific studies shall be included in this document. The smart meter described by David Villao is an AMI mesh meter, which is particularly dangerous---though as previously stated, all models of smart meters are damaging to health.

Further response to page 9:

Notwithstanding its questionable relationship with the Commission, Met Ed feigns that the order from the Commission is legally binding, when in reality any such order is violating PA Title 66/1501, the Americans with Disabilities Act, The Fair Housing Act, Public Law 90-602 and Section 804 (b) or (F) of Title VIII of the Civil Rights Act of 1968, as amended in 1988, 42 U.S.C. 3601 et.seq.

Since there is a questionable relationship between The PUC The ALJ, and Met Ed it is obvious that the Platts will end up having to appeal at the federal level. The Platts know first-hand how dangerous smart meters are; they are tenacious and assiduous and are fully willing to end up in federal court.

Continuing with David Villao's mendacious testimony, Met Ed pretends it is a burden to comply with PUC's ersatz "legally binding" agreement. When in reality, Met Ed gets to fire analog meter readers, so it does not have to pay them, thereby saving money in their quest for record profits', and deploying smart meters with no consideration for the health and safety of their customers

Response to page 10:

This is a bastardization of the interpretation of Act 129. See. Wes Zimmerman Brief and Holder's Reply exceptions. David Villao acts as if an ersatz law to sicken people is some lofty imperative. Slavery was the law. The inability for women to be judges and lawyers was the law. Barring women from voting was the law. No doubt, if these laws were in existence today, David Villao would champion their enforcement at the expense of suffering humans. It should be noted that the Commonwealth Court initially ruled that Act 129 was NOT a mandate. The PUC and utility companies didn't like the outcome, so they appealed to the Supreme Court.

Of significance is the fact that even the Supreme Court allowed for accommodations for people who did not want a smart meter, and these are evident on page 7, page 62 and page 63 of the PA Supreme Court ruling. It has already been established that the PUC and Met Ed are violating laws: toxic tort regulations, The Americans with Disabilities Act, The Fair Housing Act, Public Law 90-602 and section 804 (B) or (F) of Title VIII of the Civil Rights Act of 1968, as amended in 1988,42 U. S. C. 3601 et.seq.

Response to page 11 regarding termination:

One would expect nothing less from the heartless PUC and Met Ed.

Response to pages 11 and 12 Safety Section number V:

David Villao clearly knows the fact that the FCC lost in Federal Court against the Environmental Health Trust and the Children's Defense Fund in 2021.

In fact, The Environmental Health Trust and Children's Defense Fund submitted into evidence 11 (ELEVEN) VOLUMES of scientific and medical data proving the dangers of electromagnetic radiation, including from smart meters.

FCC must comply with the 2021 court order requiring the agency to consider thousands of scientific studies and update the outdated wireless radiation exposure guidelines, which have not been updated in over 28 years.

See exhibits 081321-DC Circuit case EHT v. FCC. 081321 26. See also Digital Equity FCC NOI Comments 5-16-22.

David Villao knows full well there are 20,000 studies of settled science proving that radiation and conducted emissions from devices such as smart meters are harmful and dangerous to health. Some of these studies are included in this surrebuttal. Studies documenting the dangers of smart meters Include but are not limited to:

The Naval Medical Research study, The Collegium Ramazzini study which authenticated cellular damage and malignancies at much lower levels of radiation than previously believed, The Santa Cruz study, The American Pediatric Society study, The Lamech study which is included in this brief, and the Bill Bathgate study of a fellow Bucks County residence, which registered huge amounts of radiation and conducted emissions from a neighbor's smart meter 75 feet away, which we have included in this brief. Also see Ecology T Mobile Study included in this brief. Other documentation has already been referenced previously in response to page 11 and page 12.

David Villao would have read the extensive, painstaking study of a local smart meter in Mr. Platt's county, conducted by renowned electrical engineer Bill Bathgate. This was submitted previously in a prior communication and we will submit it again, should it be requested (Exhibit: Roy Cummings report.)

20,000 scientific studies, some of which are included in this brief, refute Villao's mendacious and outrageous contention as to the safety of smart meters. Smart meters are not safe!! Villao's mendacious rebuttal is fueled by acquisitive avarice, as smart meters are big money For Met Ed and the PUC.

David Villao is aware of Mr. Platt's extreme and dangerous reactions to smart meter exposure. However, in Villao's moral turpitude, he conveniently and deviously elides any mention of the danger installing a smart meter would pose to Mr. Platt's health.

In their previous amended motion of 2024, the Platts stated their daughter has Misophonia; Kim Platt stated in the previous amended motion that she has more irritability and agitation when exposed to electromagnetic frequencies.

David Villao is aware of the health damage posed by smart meter exposure for Mr. Platt. This is evidenced by the fact that Villao's rebuttal is a rebuttal to the amended motion which articulates the health damages Mr. Platt suffers and has suffered when exposed to a smart meter. Villao is asked "Do you have any reason to believe based on your experience and the direct testimony submitted by Ms. Engisch and Mr. Platt, that the smart meters being installed by the company are unsafe?"
Villao answers "No" and references the FCC, which already lost in DC Federal Court for failure to update the wireless radiation exposure guidelines! This has already been covered in this surrebuttal along with relevant court documents.

The following section reiterates the severe reaction suffered by Mr. Platt upon smart meter exposure, taken from the Platts Amended Motion of 2024.

As already stated, David Villao had this in his possession because he rebutted it.

KIM PLATT HAS SEVERE HEALTH REACTIONS WHEN EXPOSED TO A SMART METER. ON OR AROUND OCTOBER 19, 2019, MR. PLATT WAS SITTING IN THE HOUSE OF A NEIGHBOR FOR UNDER AN HOUR.(IT SHOULD BE NOTED THAT MR. PLATT AVOIDS USING A CELL PHONE BECAUSE IT ELICITS SICKENING REACTIONS AS WELL- ESPECIALLY THE SEARING PAIN AND RINGING IN HIS EARS - ALTHOUGH NOT AS SEVERE AS A SMART METER).

MR. PLATT'S EARS STARTED TO BURN WITH TERRIBLE PAIN AND RINGING. HE BEGAN TO FEEL DIZZY. HIS EYELIDS AND LIPS FELT A TERRIBLE BURNING SENSATION. HIS HEART STARTED TO POUND AND SKIP BEATS WITH STABBING PAIN IN HIS CHEST. HE LEFT THE NEIGHBOR'S HOUSE BECAUSE HE WAS BECOMING SICKER. HE BEGAN TO WALK TOWARDS HIS HOME, FEELING DIZZY, BUT REALIZED HIS LEGS WERE GIVING WAY AND HE WAS VERY WEAK. HE LAY FOR PROBABLY TWO HOURS ON THE GROUND, CONTINUING TO FEEL THE PAIN OF BURNING SENSATIONS IN HIS EARS, LIPS AND EYELIDS AND EAR RINGING. AFTER APPROXIMATELY TWO HOURS, KIM'S WIFE DEBORAH FOUND HIM OUTSIDE AND HAD TO ASSIST HIM INTO THE HOUSE! (A SECOND UNFORTUNATE ENCOUNTER WITH A SMART METER AT THE HOUSE OF A RELATIVE EVOKED THE SAME REACTION, THOUGH MR. PLATT LEFT IN A HURRY SO AS TO MINIMIZE THE DAMAGE).

AFTER MR. PLATT'S DANGEROUS EXPOSURE TO HIS NEIGHBOR'S SMART METER, HE WAS UNABLE TO WORK FOR TWO DAYS.

On or around May 14th, 2024, Mr. Platt did some work at a neighbor's house. Since he was not sitting directly in front of the placement on the other side of the wall of the smart meter, as he had been in October 2019----where he had to lie on the ground, post-exposure for two hours, unable to get up-----Mr. Platt thought that since he was farther away from the smart meter at this neighbors' house, he would be able to tolerate the smart meter. However, Mr. Platt had an extremely dangerous reaction to this neighbor's smart meter. He was hardly able to finish the job. He experienced tachycardia and arrhythmia, with stabbing pains in his chest and shortness of breath. Mr. Platt is very fit. His general pulse is around 62 beats a minute, but in this instance with exposure to the smart meter, his pulse rate shot up to 88 beats a minute. Again, he experienced the burning sensations on his eyelids and lips, along with dizziness and weakness. For four days, he could feel a sensation as if his pulse were beating in his ears. The ear ringing and pain in his ears became unbearable. He became weak and dizzy and had difficulty walking.

This begs the question of what would befall Mr. Platt, if he were exposed to a smart meter every day for 24 hours a day! Complainants also reserve the right to supplement Mr. Platt's physician's report at a later date.

The complete abrogation of any rights or humanity concerning Mr. Platt's severe and dangerous reactions to a smart meter ------and the relentless evil of Met Ed and PUC in attempting to install a smart meter on the Platt's home-----are the same paradigm that ensued in Nazi Germany. In Nazi Germany, individuals who were not considered to exemplify the Aryan ideal by being handicapped or disabled were unceremoniously killed. In complete disregard of the Americans with Disabilities Act, other aforementioned laws and the basic dignity of Mr. Platt's life and health, Met Ed and PUC are resolute in their morally dissolute goal of endangering Mr. Platt's life.

In Nazi Germany, anyone who was 'behindern', to use the German word, was "in the way'" and for whom all legal rights as a citizen were ignored. In similar fashion Mr. Platt is" in the way" of Met Ed and PUC's relentless effort to ignore his civil rights. Again, smart meters are big business. Keeping in mind that The Commonwealth of Pennsylvania is the only state that disallows opt out, Met Ed and PUC are more than happy to use their handiwork—the smart meter---to destroy and endanger Mr. Platt's health and life.

It should be noted that Deborah Engisch- Platt suffers from chronic Post Traumatic Stress Disorder and the threat of a smart meter is a source of continuing duress for her.

This document serves as a Notice of Liability to individual operatives Involved in any way in the deviant goal of trying to install a smart meter on the Platt's house. The individuals who are liable for toxic tort lawsuits and other federal lawsuits for violations of the A.D.A., Section 804, (b) or (f) Title VIII of the Civil Rights Act of 1968 as amended in 1988, 42 U. S. C. 3601 et.seq., the Fair Housing Act and Public law 90-602 include but are not limited to Tori Geisler, Lauren Lepkowski, James Austin Meehan, David Villao, and operatives of PUC Stephen de Frank, Rosemary Chiavetta and Kimberly Barrow. Neither Lloyds of London nor Swiss Re will cover any liability from electromagnetic/smart meter damages and this document serves as NOTICE OF LIABILITY.

Think Love Canal. Think mesothelioma. Think Camp Lejeune.

Response to pages 12 and 13 Privacy and security sections:

It is plangently disingenuous For Met Ed to laud its ersatz "privacy" policies, and at the same time extirpate the privacy of the Platts to use their private autonomy to choose an electric service that is not dangerous to their health.

The Transatlantic Consumer Dialogue, a coalition of consumer groups in Europe and North America wrote in their annual meeting in Brussels, Belgium per the Smart Meter White Paper, warning that "The dramatic increase in the granularity of data available and frequency of collection of household energy consumption means that the smallest detail of household life can be revealed."

Former CIA director James Woolsey says the hacking vulnerabilities of the smart meter grid render it “a really, really stupid grid”.

Cyber security expert David Chalk says,” There is not a power meter or device on the grid that is protected from hacking if not already infected with some kind of Trojan horse that can cause the grid to be shot down or completely annihilated.” {Sources EMF Safety Network}.

Response to page 14 penultimate question:

The company has violated toxic tort regulations, The Americans with Disabilities Act, The Fair Housing Act, Public Law 90-602 and Section 804 (b) or (f) of the Civil Rights Act of 1968, as amended in 1988, 42 U. S. C. 3601 et.seq. See HUD Smart Meter Settlement where the plaintiffs won against smart meters per the Civil Rights Act.

The fact that Met Ed and PUC continue to violate the Complainants rights may force the Platts’ to undertake a toxic tort lawsuit with legal representation, against Met Ed, PUC and individual operatives, as already stated.

Response to page 14, final question.**:**

This concludes the surrebuttal of Kim E. Platt and Deborah Engisch-Platt to the rebuttal testimony of David Villao.

We verify all the aforementioned facts to the best of our ability

These digital signatures serve as true signatures.

___Kim Platt_____ __Deborah Engisch-Platt__

Kim Platt Deborah Engisch-Platt

IN THE SUPREME COURT OF PENNSYLVANIA

Docket Nos. 34-36 MAP 2021

37-39 MAP 2021

40-45 MAP 2021

MARIA POVACZ
LAURA SUNSTEIN MURPHY
CYNTHIA RANDALL AND PAUL ALBRECHT

v.

PENNSYLVANIA PUBLIC UTILITY COMMISSION

BRIEF FOR AMICUS CURIAE BY MR. WES ZIMMERMAN IN SUPPORT OF MARIA POVACZ, LAURA SUNSTEIN MURPHY, AND CYNTHIA RANDALL AND PAUL ALBRECHT

Brief of Amicus Curiae Supporting Maria Povacz, Laura Sunstein Murphy, and Cynthia Randall and Paul Albrecht's Appeal from the Commonwealth Court's October8, 2020 Order at Docket Nos. 492 C.D. 2019, 606 C.D. 2019, and 607 C.D. 2019, which affirmed in part, reversed and remanded in part, and vacated and remanded in part the Pennsylvania Public Utility Commission's Opinion and Orders entered at Docket Nos. C-2015-2475023, C-2015-2475726, and C-2016-2537666

Wes Zimmerman
69 Goat Hill Road
Boyertown, PA 19512

Date: September 1, 2021

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Table of Authorities

Pennsylvania Administrative Agency Decisions

- *Frompovich v. PECO Energy Co, Docket No.* C-2015-2474602
- *Smart Meter Procurement and Installation (Implementation Order),* Docket No. M-2009-2092655
- *Joint Petition of Met-Ed, Penelec, and Penn Power for Approval of Smart Meter Technology Procurement and Installation Plan,* Docket No. M-2009-2123950 (PUC Public Meeting 4/15/10)
- *Monica Smith & Mike Williams v. Met-Ed,* Docket No. C-2018-3000222
- *Met-Ed Smart Meter Deployment Plan,* Docket No. M-2013-2341990
- *2021 Total Resource Cost (TRC) Test,* Docket No. M-2019-3006868

Pennsylvania General Assembly Legislative Journals & Legislative History

- Pennsylvania House Journals, February 11, 2008, pages 386-403 and February 12, 2008, pages 430-432
- Pennsylvania Senate Journal, October 8, 2008, pages 2626-2631
- House Bill No. 2200 of 2008, Printer's No. 3218
- House Bill No. 2200 of 2008, Printer's No. 3233
- House Bill No. 2200 of 2008, Printer's No. 4429
- House Bill No. 2200 of 2008, Printer's No. 4526

PA Statutes, Regulations, and Rules

- 66 Pa. C.S. §2807(f)(2)
- 66 Pa. C.S. §2807(f)(6)
- 66 Pa. C.S. §2807(f)(7)
- 66 Pa. C.S. §1703(a) & (b)

Federal Statutes, Regulations, and Rules (including definitions)

- 26 U.S.C. §167 – Depreciation
- 26 C.F.R. §1.167(a)-1 – Depreciation in General
- 65 FR 47666. IV Discussion.
- 18 CFR 101. Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act, Definition No. 12

Other Authorities

- Black's Law Dictionary Free Online Legal Dictionary 2nd Ed.

I. Statement of Interest

I am a Pro Se plaintiff in a PA PUC (PUC) administrative court case against Metropolitan Edison Company (Met-Ed).[1] My case was stayed due to the instant case. I have shared my analysis with many other Pro Se complainants needing assistance on what the law means, and many of those cases are currently stayed at the Commonwealth Court and PA PUC administrative court, ready to be argued and appealed.

The term "depreciation" and what it means is key to any analysis seeking to define PA C.S. §2807(f)(2)(iii). I am uniquely qualified to provide this analysis. I am a Special Agent with a federal law enforcement agency. I investigate criminal violations of federal tax laws and other related criminal statutes, such as money laundering, wire fraud, mail fraud, bank fraud, conspiracy and more. Prior to my position as a Special Agent, I was a Revenue Agent and Subject Matter Expert with the Internal Revenue Service's Large Business and International Division for approximately 8 years. In those roles, I conducted technical tax examinations of large and international businesses that dealt with intricacies of tax law, regulations, various rulings, technical advice memorandums, and judicial precedent, as well as advising examination teams nationwide. In these positions, I have analyzed and interpreted the meaning of many different statutes, especially those involving

[1] V. Wes Zimmerman v. Metropolitan Edison Company, Docket No. C-2019-3007568

federal tax law. Through this experience, I am uniquely qualified to opine on PA C.S. §2807(f)(2), especially §2807(f)(2)(iii). The analysis I provide in this Amicus Brief is my own personal analysis and is not the analysis or opinion of my employer. Additionally, no other person or entity paid for the writing of this Amicus Brief.

II. Summary – Act 129 Does NOT Mandate Smart Meters

The case at hand concerns the appeals of the PUC, PECO Energy Company (PECO), and customer complainants Maria Povacz, Laura Sunstein Murphy, and Cynthia Randall and Paul Albrecht ("Complainants") challenging the Commonwealth Court's decision in *Povacz v. Pa. PUC*, 241 A.3d 481 (Pa. Cmwlth. 2020) ("*Povacz*"). In *Povacz*, the Commonwealth Court held, among other things, that Act 129 of 2008 (the Act) does not mandate that electric distribution companies (EDCs), like PECO, install smart meters, and remanded the case back to the PUC for consideration of customers' requests for accommodations, if any are appropriate, given the court's decision that the Act does not mandate smart meters.

The Commonwealth Court was correct in its finding that the Act does not mandate the installation of a smart meter, however, the Court did not base its conclusion on a complete analysis of the relevant portion of the Act. A complete analysis is the topic of this brief. The court also erred in remanding back to the

PUC for accommodations. Because the Act does not mandate smart meters, which as you will see, it does not, there is no accommodation or state-wide opt-out needed.

The relevant part of the Act to be analyzed is PA C.S. §2807(f)(2), **IN ITS ENTIRETY**. PA C.S. §2807(f)(2) states:

(f)(2) Electric distribution companies shall furnish smart meter technology as follows:

(i) Upon request from a customer that agrees to pay the cost of the smart meter at the time of request.

(ii) In new building construction.

(iii) In accordance with a depreciation schedule not to exceed 15 years.

The Commonwealth Court focused its analysis on the word "furnish" at §2807(f)(2), and, in summary, and in conjunction with other areas of the Act, concluded that the word "furnish" does not require a customer to avail himself of every aspect of smart meter technology, thereby concluding that smart meters are not mandatory. The Energy Association of Pennsylvania in its Amicus Brief focused its analysis on the word "shall," stating that it means "must", or creates a mandate. Notably, neither of these analyses discusses §2807(f)(2)(i), (ii), and (iii) in its entirety, or fully analyzes what each means. Both miss the point entirely. My analysis will focus on what the plain language of §2807(f)(2)(i), (ii), and,

especially, (iii) means. As you will see, there is no system-wide mandate.

§2807(f)(2)(i) and (ii) require no detailed analysis. EDCs shall furnish smart meter technology upon request from a customer that agrees to pay for the cost of the meter at the time of request (§2807(f)(2)(i)), and EDCs shall furnish smart meter technology in new building construction (§2807(f)(2)(ii)). What will be shown in this analysis is that §2807(f)(2)(iii) defines the maximum service life of smart meter technology and creates a requirement that such technology be replaced at least every 15 years.

III. Analysis

A. The PUC Misrepresents the Plain Language of PA C.S. § 2807(f)(2)(iii)

As can be demonstrated by the PUC's own Implementation Order of June 2009,[2] Met-Ed's Smart Meter Deployment Plan,[3] Pennsylvania's legislative history and various accounting and tax authorities and definitions, the PUC does not interpret the plain language of PA C.S. §2807(f)(2) correctly.

The PUC Implementation Order of June 2009[4] on page 14 states, "The Commission believes that it was the intent of the General Assembly to require all

[2] Docket No. M-2009-2092655
[3] Docket No. M-2013-2341990; Met-Ed's Smart Meter Deployment Plan is a joint deployment plan with Pennsylvania Electric Company (Docket No. M-2013-2341994), Pennsylvania Power Company (Docket No. 2013-2341993) and West Penn Power Company (Docket No. 2013-2341991). For purposes of this document, it will be referred to as Met-Ed's Deployment Plan.
[4] Docket No. M-2009-2092655 (see Appendix E)

covered EDCs to deploy smart meters system-wide when it included a requirement for smart meter deployment in accordance with a depreciation schedule not to exceed 15 years."

The PUC provided no analysis of how it arrived at the conclusion above. This is the equivalent of saying "it means this because I said so." The PUC forced the plain language of §2807(f)(2)(iii) into a mandatory smart-meter narrative which has caused most EDCs to force smart meters on all customers, even over customer objections. The PUC arrives at the incorrect conclusion that Act 129 creates a state-wide mandate of smart meters by covered EDCs by misrepresenting unambiguous legislative intent and misconstruing plain legislative language that leaves no room for ambiguity.

The PUC claims the language of furnishing of smart meters "in accordance with a depreciation schedule not to exceed 15 years" to mean covered EDCs must force smart meters on all customers within 15 years. In addition, the PUC conflates furnishing smart meters with removal of analog meters, when, in fact, the Act is silent on currently deployed analog meters.

The following discussion focuses on subparagraph (f)(2)(iii) of the Act: **"Electric distribution companies shall furnish smart meter technology as follows …in accordance with a depreciation schedule not to exceed 15 years."**

Interpreting this as a mandatory roll-out of smart meters within 15 years lacks not only common sense, but also ignores a key term found in the law – "depreciation." Since "depreciation" is an accounting or tax term, it is necessary to consider how applicable authorities define the term "depreciation."

B. The PUC Uses the Term "Depreciation" Deceptively

Internal Revenue Code[5] (IRC) §167(a) and Treasury Regulation (Treas. Reg.) §1.167(a)-1(a) define depreciation as an allowance (deduction) for the exhaustion, wear and tear, and obsolescence of property used in a trade or business or property held for the production of income. Treas. Reg. §1.167(a)-1(a) goes on to dictate that depreciation deductions are allocated over an asset's useful life.

Black's Law Dictionary[6] mirrors this definition of depreciation as a decrease in the potential of an asset over its lifetime. Various financial accounting authorities have the same or similar definitions, such as the Federal Energy Regulatory Commission (FERC).[7] These definitions show that the terms "wear and tear", "exhaustion", or "obsolescence" are synonymous with the term depreciation. A depreciation schedule (or wear and tear schedule, exhaustion schedule, obsolescence schedule) is a schedule that ultimately defines an asset's

[5] Internal Revenue Code of 1986, as amended; see Appendix B and C
[6] https://thelawdictionary.org/depreciation/; see Appendix A
[7] FERC is an agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also administers accounting and financial reporting regulations of its regulated companies.

useful life (typically in terms of years) and for accounting and tax purposes - allocates the asset's cost over its useful life. In fact, Treas. Reg. §1.167(a)-1(b) defines useful life as the period over which an asset may reasonably be expected to be useful in a trade or business or for the production of income.

FERC, when it comes to defining the term "depreciation", mirrors what has already been presented above. In establishing standards for depreciation for accounting purposes, FERC wanted to ensure that electric utilities charge proper amounts of depreciation to expense in each financial reporting period for the purpose of allocating in a systematic and rational manner the cost of utility property to the periods which the property is used in utility operations, i.e. over its estimated useful service life.[8] The definition of depreciation according to FERC's Uniform System of Accounts for electric utilities is "the loss of an asset's service value not restored by current maintenance."[9] Once again, depreciation means wear and tear, obsolescence, or exhaustion of an asset – an asset like a smart meter. FERC does not somehow make the term "depreciation" mean deployment, nor does any other authority. "Deprecation" never means "deployment."

Based on the definition of "depreciation" and "useful life" as used in legal and accounting contexts, the plain statutory language of §2807(f)(2)(iii) must be

[8] 65 FR 47664 and 65 FR 47666; see Appendix D
[9] 18 CFR 101. Definition No. 12; see Appendix D

interpreted as follows – using terms synonymous with depreciation to aid in interpretation:

> **Electric distribution companies shall furnish smart meter technology as follows … in accordance with a wear and tear, exhaustion, or obsolescence schedule not to exceed 15 years.**

In other words, §2807(f)(2)(iii) establishes the maximum service life of smart meters. This paragraph of the Act makes no reference to a mandatory roll-out of smart meters by all EDCs (regardless of their number of customers). It does not say nor can it be inferred in any way, that there is a required system-wide deployment of smart meters on a schedule of no longer than 15 years, as stated in the PUC's 2009 Implementation Order. This section of the Act does not refer to replacing analog meters (in fact, no section does). Rather it plainly spells out that AMI (smart meters) are to have a service period not to exceed 15 years, and Met-Ed's Smart Meter Deployment Plan (discussed later) confirms this.

The General Assembly previously enacted laws regarding the term "depreciation" as part of the Public Utility Consolidated Statutes. Section 1703 of Title 66 states in part:

> §1703. Depreciation accounts; reports.
>
> (a) Accounts.--<u>Every public utility shall carry on its books or records of account, proper and reasonable sums</u>

representing the annual depreciation on its property used or useful in the public service, which sums shall be based upon the average estimated life of each of the several units or classes of depreciable property. The commission, by appropriate order, after hearing, shall, except where found to be inappropriate, establish for each class of public utilities, the units of depreciable property, the loss upon the retirement of which shall be charged to the depreciation reserve. (underlining added)

66 Pa. C.S. 1703(a).

66 PA C.S. §1703 (b) states:

(b) Statements.--Every public utility shall file with the commission, at such times and in such form as the commission may prescribe, statements setting forth the details supporting its computation of annual depreciation, as recorded on the books or records of accounts of the public utility. If the commission, upon review of such statements, is of the opinion that the amount of annual depreciation so recorded by any public utility is not reasonable and proper, it may, after hearing, require that

> provision be made for annual depreciation in such sums as may be found by it to be reasonable and proper. In making its findings, the commission shall give consideration to the experience of the public utility, and the predecessors of the public utility in accumulating depreciation reserves, the retirements actually made, and such other factors as may be deemed relevant.
> (underlining added)

Clearly the General Assembly was familiar with the term "depreciation" when it made a policy decision to specify the "useful life" of smart meters. That decision is consistent with Section 1703.

There is evidence elsewhere in the Act showing that the General Assembly knows the meaning of the word "depreciation." §2807(f)(7) says "an electric distribution company may recover reasonable and prudent costs of providing smart meter technology under paragraph (2)(ii) and (iii),[10] as determined by the commission. §2807(f)(7) says these costs include "annual depreciation and capital costs over the life of the smart meter technology and the cost of any system upgrades that the electric distribution company may require to enable the use of smart meter technology….."

[10] Specifically, this is referring to 2807(f)(2)(ii) and (iii).

Yet again – the General Assembly correctly applies the term "depreciation" in the context of the Act. In §2807(f)(7) the General Assembly knew that depreciation is a cost allocating the wear and tear of a smart meter over its useful life. Depreciation means the same thing here as it does in §2807(f)(2)(iii). Depreciation means depreciation (also known as wear and tear, obsolescence, or exhaustion). Depreciation does not mean deployment.

§2807(f)(2) in its entirety as written by the General Assembly means that the only way homeowners would be furnished their first smart meter was to request one and pay for its cost at time of such request (if living in existing construction). In new construction, smart meters "shall be furnished." Thereafter, the smart meter that was furnished must be replaced with a new smart meter over a period not to exceed 15 years.[11]

The PUC incorrectly interprets (f)(2)(iii) as a requirement for system-wide smart meter deployment within 15 years with no exceptions. The PUC has substituted "deployment and installation schedule" for "depreciation schedule." Nowhere does any authority define or use the terms "deployment" or "installation" as synonymous with the term "depreciation."

[11] It should be noted, there does not appear to be any prohibition from an EDC asking a customer if they consent to the installation of a smart meter if a customer would not fall under 2807(f)(2)(i) or (ii). Instead, covered EDCs have been forcing smart meters on customers not falling under 2807(f)(2)(i) or (ii).

§2807(f)(2) of the Act says EDCs shall furnish smart meter technology under three conditions only, and none of those conditions means a system-wide mandatory deployment.

§2807(f)(6) of the Act states that subsection (f) does not apply to EDCs with 100,000 or fewer customers. This does not mean that customers of all EDCs with 100,001 or more customers must accept a smart meter, rather it means that (f)(2)(i), (f)(2)(ii), and (f)(2)(iii) do not apply to EDCs with 100,000 or fewer customers. Therefore, EDCs with 100,000 or fewer customers do not have to furnish a smart meter upon request from a customer and nor do they have to furnish a smart meter in new construction. It does not mandate smart meters on customers of EDCs with 100,001 or more customers.

§2807(g) of Act 129 does include definitions of smart meter technology, including that it shall enable time-of-use rates, HOWEVER, the ONLY section of Act 129 that discusses how this technology "shall be furnished" is section (f).[12]

C. The PUC Actually Knows the Correct Meaning of "Depreciation"

In its Implementation Order of June 2009, on page 12 (where new construction is discussed), the PUC states the following: "As with all equipment, meters have a useful life. EDCs determine how much to invest in meter equipment

[12] As smart meters are provided to those who request one, and in new building construction, time of use rate requirements are honored.

based on its useful life and have an opportunity to depreciate that investment over the useful life of the meter. In addition, EDCs have an opportunity to recover the cost of the meter from ratepayers."[13]

As shown above, the PUC used the terms "useful life" and "depreciation" when discussing meters (including smart meters) and related those terms to the meter's cost and its useful life. This example taken from the PUC's 2009 Implementation Order illustrates that the PUC appears to know that "depreciation" is, in fact, a term that relates to exhaustion, wear and tear, and obsolescence of an asset, and knows that for accounting purposes, depreciation refers to allocating the cost of an asset over its useful life. It also shows that the PUC should know that depreciation does not mean "mandatory deployment." Rather depreciation is a result of deployment of an asset.

After showing an understanding of what depreciation means on page 12, it is unclear how only two pages later in the Implementation Order, on page 14, the PUC states "The Commission believes that it was the intent of the General Assembly to require all covered EDCs to deploy smart meters system-wide when it included a requirement for smart meter deployment "in accordance with a

[13] See Appendix E

depreciation schedule not to exceed 15 years."[14] There is simply no basis for this position.

Further, on page 28 going into page 29 of the Implementation Order where recovery of costs of deployment and installation of smart meter technology is discussed,[15] the PUC states "these costs would include both capital and expense items relating to all plan elements, equipment and facilities, as well as an analysis of all administrative costs. More specifically, these costs would include, but not be limited to, capital expenditures for any equipment and facilities that may be required to implement the smart meter plan, as well as depreciation, operating and maintenance expenses." Once again – the PUC uses the term "depreciation" correctly as an accounting term as a cost ***resulting from*** the deployment of smart meters. "Depreciation" is not synonymous with the term "deployment" – rather the terms are separate and distinct.

The PUC's discussion of the recovery of costs in the paragraph above comes from §2807(f)(7) of the Act. §2807(f)(7) provides that part of the recoverable costs include annual depreciation and capital costs over the life of smart meter technology. In §2807(f)(7), depreciation is clearly an expense for the exhaustion, wear and tear, and obsolescence of a smart meter. Based on the PUC's 2009

[14] See Appendix E
[15] See Appendix E

Implementation Order references to "depreciation" discussed above, the PUC appears to understand the correct meaning and usage of the term. It is not logical that "depreciation" should somehow be defined completely differently by the PUC for purposes of §2807(f)(2)(iii). Nor is it truthful to ascribe to legislators an intent which was entirely absent from actual wording and legislative discussion just prior to passage of the Act solely for purposes of §2807(f)(2)(iii).

Additional historical clarity can be seen in the words of the PUC itself – as recently as December 19, 2019. In its Act 129 Total Resource Cost (TRC) Test for 2021[16], on page 21, the PUC discusses effective useful life and stated "While certain technologies may have an expected useful life greater than 15 years, Act 129 is clear about the 15-year limit, and any adjustment to the cost ledger would circumvent the legislative directive."[17] Here – the PUC correlates useful life with the cost of a technology – providing additional evidence that the meaning of depreciation is fully understood. Also of note is the repetitive theme of a 15 year useful life seen in the Act.

[16] Act 129 discusses the TRC test being a standard test that is met if, over the effective life of each plan not to exceed 15 years, the net present value of the avoided monetary cost of supplying electricity is greater than the net present value of the monetary cost of energy efficiency conservation measures. Reference to the TRC is only made here to show the PUC's correlation of cost to the useful life of technology.

[17] See Appendix F

D. Met-Ed - an EDC - Also Knows the Correct Meaning of "Depreciation"

In Met-Ed's Smart Meter Deployment Plan[18], on page 52, it states "for Capex,[19] the estimated book lives used for depreciation purposes were 15 year for smart meters and communication equipment, 5 years for hardware and 7 years for software. Book lives were determined based on input from external resources and internal subject matter experts while tax lives were based on IRS guidelines."

Like the PUC, Met-Ed also understands that depreciation is synonymous with the wear and tear of an asset over its useful life, and when used solely in an accounting context – allocating the cost of an asset over its useful life. It is also noteworthy that the book lives used by Met-Ed for smart meters and related communication equipment all coincide with §2807(f)(2)(iii) in that they do not exceed 15 years. Met-Ed even stated that its internal subject matter experts agree. Also noteworthy is that §2807(f)(7) states that an EDC may recover the reasonable and prudent costs of providing smart meter technology under paragraph (2)(ii) (new building construction) and (iii) (in accordance with a depreciation schedule not to exceed 15 years). The Act itself ties the costs of smart meter technology to a

[18] Docket No. M-2013-2341990; see Appendix G
[19] This is an abbreviation for capital expenditure.

useful life not to exceed 15 years; and Met-Ed has acknowledged that legislative directive.

On page 76 of Met-Ed's Smart Meter Deployment Plan it states "for meters that are removed or become obsolete due to the installation of smart meters ("Legacy Meters"), the Companies propose to retire the meters out of stock, continue their existing depreciation schedule unaltered over their remaining lives as a regulatory asset, and continue cost recovery through base rates." The rate base equivalent of the regulatory asset for Legacy Meters plus the Cost of removal net of Salvage will continue to be included in the respective Company's base rate. This protocol would have no current impact on customer rates. For accounting purposes, the Companies are asking the Commission to approve an accounting treatment that would allow them to create a "regulatory asset" for the Legacy Meters with a recovery schedule equal to the remaining depreciable lives of the assets per the Companies' depreciation records." (underlining added for emphasis).

What the above paragraph from Met-Ed's Deployment Plan means is that Med-Ed (the EDCs) proposed to continue depreciating existing meters using the existing meters' regular depreciation schedules over their remaining lives to recover the full costs of those meters through base rates if they were taken out of service prior to the end of their useful life after forced deployment of smart meters resulting from the PUC's erroneous interpretation of the Act. In other words, this

is a request by Met-Ed to continue charging customers for meters that are taken out of service until their full cost is recovered from the customer. But once again, and more importantly, in the paragraph above Met-Ed shows that depreciation is a term tied to the wear and tear of an asset allocated over the asset's useful life. In this instance depreciation is discussed for purposes of continuing to charge base rates, but the meaning of depreciation is again confirmed by Met-Ed to be the same as established throughout this analysis.

The PUC and Met-Ed appear to understand what depreciation means, and that §2807(f)(2)(iii) imposes a maximum 15 year limit on the service life of smart meters; yet both state repeatedly that §2807(f)(2)(iii) imposes a mandated deployment of smart meters to all customers of covered EDCs. The PUC and Met-Ed thus are clearly capable of understanding and using the correct interpretation of the words "depreciation schedule", but not when they are defending their erroneous misinterpretation of legislative intent and the PUC's Implementation Order of June 2009.

E. The Legislative History Shows That No Mandate Was Intended

Additional clarity is afforded by reviewing the third clauses of §2807(f)(2) of the PA General Assembly Legislative Journals for Printer's Numbers (PNs) of versions of House Bill 2200 (HB 2200 became the Act) that were NOT passed into law to see what language was excluded from the final version passed into law.

PNs 3218 and 3233 (February 11 and 12, respectively, 2008) both stated, "Electric distribution companies shall furnish smart meter technology to: …(C) One hundred percent of its customers within ten years after the effective date of this paragraph."[20]

The *House Journal* records numerous dissenting comments about the mandatory nature of these PNs.

- House Journal, February 11, 2008, pages 386-403 [p. 390 Mr. Hutchinson; 390-391 Mr. Godshall; p. 392 Mr McCall; p.393 Rep. Smith and Mr. Saylor; p. 395 Mr. Benninghoff; p.397 Mr. Gabig].[21]
- House Journal, February 12, 2008, pages 430-432 [p. 431: Mr. Hutchinson].[22]

PN 4429 (September 23, 2008) stated, "ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS: …(III) IN ACCORDANCE WITH A SCHEDULE OF REPLACEMENT OF FULL DEPRECIATION OF EXISTING METERS."[23]

Note that PNs 3218 and 3233 which mandated smart meters for all customers, and PN 4429 which made reference to retiring from service and replacing existing

[20] In both PNs 3218 and PN 3233, the third clause is actually §2807(E)(6)(II)(C). See Appendices I and J.
[21] See Appendix M
[22] See Appendix N
[23] In PN 4429, the third clause is now §2807(f)(2)(iii). See Appendix K.

meters were NOT PASSED INTO LAW. It is also worth noting that there would be no way to logically think "depreciation" could be synonymous with "deployment" in the paragraph above from PN 4429. It simply makes no sense. Also noteworthy is that PN 4429, again – which was NOT passed into law - would have required covered EDCs to replace fully depreciated existing meters that had exceeded their useful life with smart meters. However, this language in PN 4429 was changed, and is in sharp contrast to the language that was passed into law.

Any interpretation of §2807(f)(2)(iii) of the Act, such as the PUC and EDCs espouse, that it mandates smart meters for all customers or that it makes any reference at all to existing analog meters is erroneous. Those interpretations are based on language that the PA legislature purposefully modified and are based on language that was NOT PASSED INTO LAW. The prior PNs of the Act that were NOT passed into law should not have formed the basis for the PUC's Implementation Order of June 2009, which the PUC and all of its Administrative Law Judge's (ALJs) cite for the purpose of ruling against every smart meter formal complaint to date.

A system-wide mandated deployment of smart meters is not the meaning of §2807(f)(2)(iii), and the legislature understood this. The Senate Journal records of PN 4526, the version that WAS signed into law,[24] clearly show this. Discussion of

[24] See Appendix L for P.N. 4526

PN 4526 in the Senate is recorded in the Senate Journal on October 8, 2008, pages 2626-2631, from which the following comments pertinent to smart meters and concerns about customers are taken.[25]

p 2626

Senator TOMLINSON.

"It also contains language in there that we will have smart meters. **It is not mandated,** but it allows for the deployment of smart meters through a depreciation process, through new home construction process, and through the depreciation of 15 years, and **for anyone who wants to purchase a smart meter which they feel will help them manage their electric load better."**

p. 2627

Senator BOSCOLA.

"We also made sure that smart meters would not be mandated for every single ratepayer. Not only is that a smarter approach to smart meter deployment, but it will also save electric customers hundreds of millions of dollars paying for something that will not provide a real benefit in their own households."

p. 2629

Senator FUMO

[25] See Appendix O

"In addition, **we did not mandate smart meters, but we made them optional.** We did say in new construction, where they really are practical, they will be put in."

F. The PUC/EDCs Use of the "Opt-Out" Legislative Proposals Argument is Illogical in the Absence of a Mandate

Time and time again in the PUC formal complaint administrative process, ALJ and PUC decisions have been rendered against smart meter complainants stating that the Act does not allow for opt outs. This reasoning is misleading. The Act does not provide any legislative opt outs because it was an "opt in" statute, other than new construction.[26] It was solely and unequivocally the PUC's erroneous misinterpretation of the legislative intent and meaning of the words "in accordance with a depreciation schedule not to exceed 15 years" that enabled the PUC to turn the Act into a mandatory no opt out smart meter deployment law. If the PUC had not completely misconstrued the legislative intent and meaning of the law for its own purposes, there would never have been an urge for a legislative or regulatory opt out.

[26]The absence of a plainly stated opt-out provision does not preclude a utility customer from declining a meter based on various unsafe conditions (including medical implications and negative health effects) that could be caused or exacerbated by smart meter radiofrequency emissions in accordance with 66 Pa. C.S. §1501.

The PUC, Met-Ed and other EDCs have either stated or insinuated that the existence of various smart meter opt-out bills proposed by the PA state legislature proves that the legislative intent of the Act was mandatory system-wide deployment. This is patently false. The first smart meter Opt-Out bill was proposed in 2012 by State Rep. Mike Reese (House Bills 2186 and 2188 most recently reintroduced as four bills - House Bills 310, 311, 312 and 313). The initial Bills were introduced approximately three years AFTER the PUC's 2009 Implementation Order, and only one year after the PUC started to dismiss all smart meter formal complaints filed by Pennsylvania residents. The introduction of smart meter opt out bills was prompted by the urging of constituents who, without exception, were denied opt outs and accommodations in formal complaint filings in front of the PUC, and not for any other reason.

It is noteworthy that the first opt out bill was not introduced until years after the passing of the Act and the PUC's June 2009 Implementation Order, when the EDCs were starting their smart meter roll outs pursuant to the PUC's implementation orders, but not before then. Timing is key here and speaks volumes. Timing of the first smart meter opt out bill introduction in 2012 establishes the fact that opt out proposals were a response to the PUC's flawed Implementation Order and the PUC's refusal to change its flawed interpretation of the Act, and not because of any wording or plain language in the Act itself.

See, for example, the long string of formal complaint cases that the PUC had dismissed on the pleadings starting in 2011, cited by PECO in *Kreider v PECO* PUC Docket No.: C-2015-2469655, *PECO Energy's Petition for Reconsideration of the Commission's September 3, 2015 Order*, citing *Gavin v. PECO*, Docket No. C-2012-2325258 (Final Order entered, Jan. 24, 2012).

In PECO's Interlocutory Petition for Reconsideration in *Kreider*, PECO cited an unbroken string of formal complaint smart meter cases that the PUC had dismissed heretofore without a hearing, because the PUC had determined that Act 129 did not permit any opt outs:

"Indeed, no AMI meter cases have proceeded to a hearing on the right to opt out; each of PECO's cases has been dismissed on preliminary objection. *See Francis v. PECO*, Docket No. C-2014-2451351 (Final Opinion and Ordered entered, August 20, 2015); *Van Schoyck v. PECO*, Docket No. C-2015-2478239 (Initial Decision entered, June 19, 2015); *Larson v. PECO*, Docket No. C-2014-2451754 (Final Opinion and Ordered entered, June 11, 2015); *Antonio Romeo v. PECO Energy*, Docket No. C-2015-2479260 (Initial Decision entered, June 4, 2015); *Gerald H. Smith v. PECO*, Docket No. C-2014-2443198 (Final Opinion and Order entered April 23, 2015); *Vincent Feldman v. PECO*, Docket No. C-2015-2442308 (Initial Decision entered, April 1, 2015); *Margaret*

Hager, M.D. v. PECO Energy, C-2014-2444961 (Final Order entered, March 12, 2015); *Ellen Donnelly v. PECO Energy,* Docket No. F-2013-2330663 (Final Order Entered March 18, 2014); *Douglas Evans v. PECO Energy,* Docket No. C-2013-2368477 (Final Order entered, February 6, 2014); *Theresa Gavin v. PECO Energy*, Docket No. C-2012-2325258 (Order entered January 24, 2013); *Jeff Morgan v. PECO Energy,* Docket No. C-2013-2356606 (Final Order entered July 23, 2013); *Thomas McCarey v. PECO Energy,* Docket No. C-2013-2354862 (Final Order entered September 26, 2013); *Renney Thomas v. PECO Energy,* Docket No. C-2012-2336225 (Final Order entered December 31, 2013); *Maria Povacz v. PECO Energy,* Docket No. C-2012-2317176 (Order entered September 28, 2012)."

"Moreover, the Commission has ruled consistently on the "no right to opt out" issue with respect to other EDCs. *Gloria Corbett v. Pennsylvania Power Company,* Docket No. C-2011-2219898 (Final Order entered, May 27, 2011); *Richard Negley v. Metropolitan Edison Company,* Docket No. C-2010-2205305 (Final Order entered, March 3, 2011); *Richard Secrest v. West Penn Power Company,* Docket No. C-2013-2356667 (Final Order entered, Jun. 11, 2013); *Corbett v. Pennsylvania Power Company,* Docket No. C-2011- 2219898 (Order

entered May 27, 2011); *Jones v. Metropolitan Edison Company,* Docket No. C-2011- 2224380 (Order entered June 28, 2011); *Griffin v. Metropolitan Edison Company,* Docket No. C-2012- 2300172 (Order entered July 31, 2012); *Brake v. West Penn Power Company,* Docket No. C-2013- 2367308 (Order entered November 14, 2013); *Drake v. Pennsylvania Electric Company*, Docket No. C- 2014-2413771 (Order entered June 12, 2014); *Efaw v West Penn Power Company,* Docket No. C-2014-2413744 (Order entered June 12, 2014); *Sean Loughry v. PPL Electric Utilities Corp.*, Docket No. C- 2014-2445932 (Order entered March 2, 2015)."

Krieder v PECO op cit, PECO Energy's September 18, 2015 Petition for Reconsideration of the Commission's September 3, 2015 Order fn 4.

Legislators clearly remarked as to the non-mandatory intent of PN 4526, and any subsequent effort by anyone to reach out to the PUC to remark about such intent fell on deaf ears as evidenced by complaint after complaint in the PUC administrative law court. As shown by a letter written by PUC counsel dated March 20, 2018 related to PUC administrative case docket number C-2018-3000222, the PUC has taken the posture that the only way it would change its implementation order was if there was a ruling from an appellate court rejecting

the PUC's interpretation of the Act or the Act was amended.[27] However, years prior, in the PUC's Public Meeting held April 15, 2010,[28] in discussing the deployment process of smart meters and related timeframes on page 10, it states that the PUC Administrative Law Judge (ALJ) "found that the *Implementation Order* is not a regulation and does not have the full force and effect of law. Instead, it acts as a policy to provide guidelines to EDCs regarding the Commission's expectations about smart meter plans."

That statement contradicts the need for a ruling from a higher court or an amendment to the Act for the PUC to change its Implementation Order. If its Implementation Order does not have the full force and effect of law, then why would a law (that has been completely misinterpreted by the PUC) need to be re-written? Why would an appellate court need to make a ruling? The answer is that neither actually needs to take place, but the PUC's actions have put this Honorable Court in that position. The PUC itself states that its Implementation Order is a policy not having the full force and effect of law, yet it refuses to re-address its erroneous policy in the face of overwhelming evidence (well beyond a preponderance of the evidence) that it has misinterpreted the plain language of the Act, the legislative intent of the Act and the constitutionality of its Implementation

[27] See Appendix P
[28] Docket No. M-2009-2123950; see Appendix Q

Order. The PUC can change its erroneous and illegal policy; and does not need any court or the PA state legislature to do so.

G. PUC'S Ability to Change Its Implementation Order

In the PA PUC's Public Meeting held April 15, 2010[29] (the joint petition of Met-Ed and other EDCs), the discussion on page 9 states the following: "In Commission proceedings, the proponent of a rule or order bears the burden of proof. 66 Pa. C.S. § 332(a). To satisfy that burden, the proponent of a rule or order must prove each element of its case by a preponderance of the evidence. *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Comwlth. 1990). A preponderance of the evidence is established by presenting evidence that is more convincing, by even the smallest amount, than that presented by the other parties to the case. *Se-Ling Hosiery v. Margulies*, 364 Pa. 45, 70 A.2d 854 (1950). Additionally, the Commission's decision must be supported by substantial evidence in the record. More is required than a mere trace of evidence or a suspicion of the existence of a fact sought to be established. *Norfolk & Western Ry. Co. v. Pa. PUC*, 489 Pa. 109, 413 A.2d 1037 (1980)."

In this same document, as mentioned above, in discussing the deployment process of smart meters and related timeframes on page 10, it states that the PUC Administrative Law Judge (ALJ) "found that the *Implementation Order* is not a

[29] Docket No. M-2009-2123950; see Appendix Q

regulation and does not have the full force and effect of law. Instead, it acts as a policy to provide guidelines to EDCs regarding the Commission's expectations about smart meter plans."

The evidence presented herein is overwhelming that §2807(f)(2)(iii) establishes a maximum service life of smart meters and nothing further. The legislative intent is clear. "Not mandatory" means no forced deployment over a customer's objections. There is no evidence to support the PUC's position that §2807(f)(2)(iii) mandates deployment of smart meters to all customers not covered by §2807(f)(2)(i) and (ii), yet the PUC refuses to provide an actual analysis of §2807(f)(2)(iii). Effectively, it is a mandate because they said so. This cannot be accepted.

IV. Conclusion – The PUC Must be Directed to Change its Erroneous Implementation Order

Taken *in toto*, §2807(f)(2)(iii), as per the definition of depreciation based on the authorities discussed herein, as used repeatedly in the PA Public Utilities Code, and mirrored by the PUC's Implementation Order and Met-Ed's Smart Meter Deployment Plan, sets a cap on the service period of smart meters, dictating their service life not exceed 15 years. Even Met-Ed's deployment plan agrees. The final version of §2807 passed into law says nothing about replacing

electromechanical analog meters and nothing about universal forced deployment of smart meters. No such inferences as these can be made from the statutory language of Act 129, from the "intent" as recorded in the *House* and *Senate Journals* in the legislative history of HB 2200 that became Act 129, nor in the changes to the Bill wording through each Printer's Number, culminating with the final version (PN 4526) passed into law.

Thus, I have found no basis on which the PUC can justify its mandate of universal forced deployment of smart meters in its Implementation Order of June 2009 and all subsequent PUC formal complaint holdings and Implementation Orders. Consequently, no EDC in the state of Pennsylvania has a legal basis on which to force smart meters system-wide on its customers.

If one did not request a smart meter and agree to pay for it, or did not live in new building construction (presumably after implementation of Act 129 of 2008), then there is no mandated smart meter. Period. It ends there. §2807(f)(2)(iii) only deals with replacing smart meters that have exceeded their useful life (not to exceed 15 years). It is not a system-wide mandated deployment. Accordingly, because the Act does not require smart meter's system-wide, EDC customers not living in new building construction should not need to request an accommodation from the PUC for something that is clearly not mandated. This Honorable Court must direct the PUC to change its erroneous Implementation Order to make it

agree with the non-mandatory plain language of the law, and allow Pennsylvanians to keep their analog/mechanical electric meters.

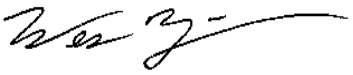
Respectfully Submitted,

Wes Zimmerman
69 Goat Hill Rd
Boyertown, PA 19512

Certificate of Word Count

I certify that in accordance with PA Rule of Procedure No. 2135(d), the preceding Amicus Curiae Brief was produced using 14-point font in the text and 12-point font in the footnotes and contains 6,655 words, excluding the cover page, Table of Contents, Table of Authorities, this Certificate of Word Count, the Certificate of Compliance, the Proof of Service, the List of Appendices and the Appendices themselves. The word count relies on the word count of Microsoft Word (the software used to prepare this Brief). The word count is less than the total words allowed under PA Rule of Procedure No. 531(b)(3).

Date: September 1, 2021



Wes Zimmerman
Amicus Curiae

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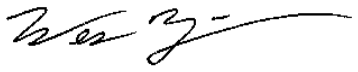

Wes Zimmerman
Amicus Curaie

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I, Wes Zimmerman, certify that on the date specified below, I served this document via email to the below named individuals pursuant to the requirements of PA. Rule of Procedure 121.

Tracey Lewis, Esquire
tracey@tslewislaw.com

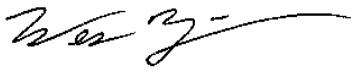
Anthony E. Gay, Esquire
Jack R. Garfinkle, Esquire
Ward L. Smith, Esquire
PECO Energy Company
anthony.gay@exeloncorp.com
jack.garfinkle@exeloncorp.com
ward.smith@exeloncorp.com

Renardo L. Hicks, Esquire
Kriss E. Brown, Esquire
Tiffany L. Tran, Esquire
Joseph P. Cardinale, Esquire
PA Public Utility Commission
rehicks@pa.gov
kbrown@pa.gov
tiftran@pa.gov
jcardinale@pa.gov

Stephen G. Harvey, Esquire
Michael E. Gehring, Esquire
steve@steveharveylaw.com
mike@steveharveylaw.com

Kenneth M. Kulak, Esquire
Anthony C. DeCusatis, Esquire
Morgan, Lewis & Bockius LLP
ken.kulak@morganlewis.com
anthony.decusatis@morganlewis.com

Date: September 1, 2021



Wes Zimmerman
Amicus Curiae

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Appendix A

The Law Dictionary

Featuring Black's Law Dictionary Free Online Legal Dictionary 2nd Ed.

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What is DEPRECIATION?

1.converting the cost of an asset into an operational cost over the lifetime. 2. a decline in market value of any asset. 3. a decrease in potential of an asset over lifetime. 4. reduction in currency value by government or floating exchange rate.

More On This Topic

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8. How Marginal Tax System Works
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10. Housing For Felons

Related Legal Terms

DEPRECIATION RATE, **PHYSICAL DEPRECIATION**, **RATE OF DEPRECIATION**, **ASSET DEPRECIATION RANGE SYSTEM (ADR)**, **ALLOWANCE FOR DEPRECIATION**, **SUM OF THE YEARS DIGITS (SYD) DEPRECIATION**, **FUNCTIONAL DEPRECIATION**, **ACCELERATED DEPRECIATION**, **ACCUMULATED DEPRECIATION**, **RECAPTURE OF DEPRECIATION**

Appendix B

''(a) Except as provided in subsections (b) and (c), the amendments made by the first section of this Act [amending this section and section 81 of this title] shall apply to taxable years ending after October 21, 1965.

''(b) If—

''(1) the taxpayer before October 22, 1965, claimed a deduction, for a taxable year ending before such date, under section 166(c) of the Internal Revenue Code of 1986 [formerly I.R.C. 1954] for an addition to a reserve for bad debts on account of debt obligations described in section 166(g)(1)(A) of such Code (as amended by the first section of this Act), and

''(2) the assessment of a deficiency of the tax imposed by chapter 1 of such Code for such taxable year and each subsequent taxable year ending before October 22, 1965, is not prevented on December 31, 1966, by the operation of any law or rule of law,

then such deduction on account of such debt obligations shall be allowed for each such taxable year under such section 166(c) to the extent that the deduction would have been allowable under the provisions of such section 166(g)(1)(A) if such provisions applied to such taxable years.

''(c) Section 166(g)(2) of the Internal Revenue Code of 1986 (as amended by the first section of this Act) shall apply to taxable years beginning after December 31, 1953, and ending after August 16, 1954.''

EFFECTIVE DATE OF 1958 AMENDMENT

Amendment by Pub. L. 85–866 applicable to taxable years beginning after Dec. 31, 1953, and ending after Aug. 16, 1954, see section 1(c)(1) of Pub. L. 85–866, set out as a note under section 165 of this title.

ESTABLISHMENT OF RESERVE FOR TAXABLE YEAR ENDING AFTER OCT. 21, 1965, AND BEGINNING BEFORE AUG. 2, 1966

Section 1(c) of Pub. L. 89–722, as amended by Pub. L. 99–514, § 2, Oct. 22, 1986, 100 Stat. 2095, provided that: ''If the taxpayer establishes a reserve described in section 166(g)(1) of the Internal Revenue Code of 1986 [formerly I.R.C. 1954] (as amended by subsection (a) of this section) for a taxable year ending after October 21, 1965, and beginning before August 2, 1966, the establishment of such reserve shall not be considered as a change in method of accounting for purposes of section 446(e) of such Code.''

SECTION REFERRED TO IN OTHER SECTIONS

This section is referred to in sections 108, 165, 172, 271, 582, 585, 593, 1351, 1367, 6227, 6511 of this title.

§ 167. Depreciation

(a) General rule

There shall be allowed as a depreciation deduction a reasonable allowance for the exhaustion, wear and tear (including a reasonable allowance for obsolescence)—

(1) of property used in the trade or business, or

(2) of property held for the production of income.

(b) Cross reference

For determination of depreciation deduction in case of property to which section 168 applies, see section 168.

(c) Basis for depreciation

(1) In general

The basis on which exhaustion, wear and tear, and obsolescence are to be allowed in respect of any property shall be the adjusted basis provided in section 1011, for the purpose of determining the gain on the sale or other disposition of such property.

(2) Special rule for property subject to lease

If any property is acquired subject to a lease—

(A) no portion of the adjusted basis shall be allocated to the leasehold interest, and

(B) the entire adjusted basis shall be taken into account in determining the depreciation deduction (if any) with respect to the property subject to the lease.

(d) Life tenants and beneficiaries of trusts and estates

In the case of property held by one person for life with remainder to another person, the deduction shall be computed as if the life tenant were the absolute owner of the property and shall be allowed to the life tenant. In the case of property held in trust, the allowable deduction shall be apportioned between the income beneficiaries and the trustee in accordance with the pertinent provisions of the instrument creating the trust, or, in the absence of such provisions, on the basis of the trust income allocable to each. In the case of an estate, the allowable deduction shall be apportioned between the estate and the heirs, legatees, and devisees on the basis of the income of the estate allocable to each.

(e) Certain term interests not depreciable

(1) In general

No depreciation deduction shall be allowed under this section (and no depreciation or amortization deduction shall be allowed under any other provision of this subtitle) to the taxpayer for any term interest in property for any period during which the remainder interest in such property is held (directly or indirectly) by a related person.

(2) Coordination with other provisions

(A) Section 273

This subsection shall not apply to any term interest to which section 273 applies.

(B) Section 305(e)

This subsection shall not apply to the holder of the dividend rights which were separated from any stripped preferred stock to which section 305(e)(1) applies.

(3) Basis adjustments

If, but for this subsection, a depreciation or amortization deduction would be allowable to the taxpayer with respect to any term interest in property—

(A) the taxpayer's basis in such property shall be reduced by any depreciation or amortization deductions disallowed under this subsection, and

(B) the basis of the remainder interest in such property shall be increased by the amount of such disallowed deductions (properly adjusted for any depreciation deductions allowable under subsection (d) to the taxpayer).

(4) Special rules

(A) Denial of increase in basis of remainderman

No increase in the basis of the remainder interest shall be made under paragraph (3)(B) for any disallowed deductions attrib-

Appendix C

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(g) *Effective date*—(1) *In general.* This section is generally effective for taxable years ending after October 21, 1965.

(2) *Transitional rule.* Section 2(b) of the Act of November 2, 1966 (Pub. L. 89–722, 80 Stat. 1151) allows additions to section 166(c) bad debt reserves in earlier taxable years on account of section 166(f)(1)(A) guaranteed debt obligations to be deducted for those earlier taxable years. Paragraphs (c), (d), (e), and (f) of this section do not apply in determining whether a deduction is allowed under section 2(b) of the Act. See Rev. Rul. 68–313 (1968–1C.B. 75) for rules relating to that deduction.

[T.D. 8071, 51 FR 2479, Jan. 17, 1986; 51 FR 9787, Mar. 21, 1986]

§ 1.167(a)–1 Depreciation in general.

(a) *Reasonable allowance.* Section 167(a) provides that a reasonable allowance for the exhaustion, wear and tear, and obsolescence of property used in the trade or business or of property held by the taxpayer for the production of income shall be allowed as a depreciation deduction. The allowance is that amount which should be set aside for the taxable year in accordance with a reasonably consistent plan (not necessarily at a uniform rate), so that the aggregate of the amounts set aside, plus the salvage value, will, at the end of the estimated useful life of the depreciable property, equal the cost or other basis of the property as provided in section 167(g) and §1.167(g)–1. An asset shall not be depreciated below a reasonable salvage value under any method of computing depreciation. However, see section 167(f) and §1.167(f)–1 for rules which permit a reduction in the amount of salvage value to be taken into account for certain personal property acquired after October 16, 1962. See also paragraph (c) of this section for definition of salvage. The allowance shall not reflect amounts representing a mere reduction in market value. See section 179 and §1.179–1 for a further description of the term ''reasonable allowance.''

(b) *Useful life.* For the purpose of section 167 the estimated useful life of an asset is not necessarily the useful life inherent in the asset but is the period over which the asset may reasonably be expected to be useful to the taxpayer in his trade or business or in the production of his income. This period shall be determined by reference to his experience with similar property taking into account present conditions and probable future developments. Some of the factors to be considered in determining this period are (1) wear and tear and decay or decline from natural causes, (2) the normal progress of the art, economic changes, inventions, and current developments within the industry and the taxpayer's trade or business, (3) the climatic and other local conditions peculiar to the taxpayer's trade or business, and (4) the taxpayer's policy as to repairs, renewals, and replacements. Salvage value is not a factor for the purpose of determining useful life. If the taxpayer's experience is inadequate, the general experience in the industry may be used until such time as the taxpayer's own experience forms an adequate basis for making the determination. The estimated remaining useful life may be subject to modification by reason of conditions known to exist at the end of the taxable year and shall be redetermined when necessary regardless of the method of computing depreciation. However, estimated remaining useful life shall be redetermined only when the change in the useful life is significant and there is a clear and convincing basis for the redetermination. For rules covering agreements with respect to useful life, see section 167(d) and §1.167(d)–1. If a taxpayer claims an investment credit with respect to an asset for a taxable year preceding the taxable year in which the asset is considered as placed in service under §1.167(a)–10(b) or §1.167(a)–11(e), the useful life of the asset under this paragraph shall be the same useful life assigned to the asset under §1.46–3(e).

(c) *Salvage.* (1) Salvage value is the amount (determined at the time of acquisition) which is estimated will be realizable upon sale or other disposition of an asset when it is no longer useful in the taxpayer's trade or business or in the production of his income and is to be retired from service by the taxpayer. Salvage value shall not be changed at any time after the determination made at the time of acquisition merely because of changes in price

Appendix D

relinquish the property to the security representative pending proper authorization for the possession of the property or its removal from the installation. The individual relinquishing the property will be provided with a receipt for the property.

§ 1204.1004 Trespass.

Unauthorized entry upon any NASA real property or installation is prohibited.

§ 1204.1005 Unauthorized introduction of firearms or weapons, explosives, or other dangerous materials.

(a) The unauthorized carrying, transporting, or otherwise introducing or causing to be introduced, or using firearms or other dangerous weapons, explosives or other incendiary devices, or other dangerous instrument, substance, or material likely to produce substantial injury or damage to persons or property, into or upon NASA real property, facility, or installation, is prohibited.

(b) Paragraph (a) of this section shall not apply to:

(1) The lawful performance of official duties by an officer, agent, or employee of the United States, a State, or a political subdivision thereof, or NASA contractor, who is authorized to carry firearms or other material covered by paragraph (a) of this section.

(2) The lawful carrying of firearms or other dangerous weapons at or on a NASA installation after written prior approval has been obtained from the installation Security Office in connection with sanctioned hunting, range practice, or other lawful purpose.

§ 1204.1006 Violations.

Please take notice that anyone violating these regulations may be cited for violating Title 18 of the United States Code (U.S.C.) Section 799, which states that whoever willfully shall violate, attempt to violate, or conspire to violate any regulation or order promulgated by the Administrator of the National Aeronautics and Space Administration for the protection or security of any laboratory, station, base or other facility, or part thereof, or any aircraft, missile, spacecraft, or similar vehicle, or part thereof, or other property or equipment in the custody of the Administration [NASA], or any real or personal property or equipment in the custody of any contractor under any contract with the Administration or any subcontractor of any such contractor, shall be fined under this title [Title 18], or imprisoned not more than one year, or both.

Daniel S. Goldin,

Administrator.

[FR Doc. 00–19622 Filed 8–2–00; 8:45 am]

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DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

18 CFR Part 101

[Docket No. RM99–7–000; Order No. 618]

Depreciation Accounting

Issued July 27, 2000.

AGENCY: Federal Energy Regulatory Commission, DOE.

ACTION: Final rule.

SUMMARY: The Federal Energy Regulatory Commission (Commission) is amending the General Instructions of 18 CFR part 101 to establish, for those public utilities and licensees that are subject to part 101, standards for determining depreciation for accounting purposes. The Commission also explains how it intends to monitor depreciation practices. This action is necessary in order to fulfill the Commission's statutory obligation to ensure that electric utilities charge proper amounts of depreciation to expense in each financial reporting period. The effect of this action will be to ensure that utilities allocate in a systematic and rational manner the cost of utility property to the periods during which the property is used in utility operations.

DATES: This rule will be effective October 2, 2000.

FOR FURTHER INFORMATION CONTACT:

Wayne McDanal (Technical Information), Office of Finance, Accounting and Operations, Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426, (202) 219–2622

Joseph C. Lynch (Legal Information), Office of the General Counsel, Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426, (202) 208–2128

SUPPLEMENTARY INFORMATION:

Before Commissioners: James J. Hoecker, Chairman; William L. Massey, Linda Breathitt, and Curt Hebert, Jr.

I. Introduction

The Federal Energy Regulatory Commission (Commission) is amending the General Instructions of 18 CFR Part 101 to establish, for those public utilities and licensees that are subject to Part 101, standards for determining depreciation for accounting purposes. The Commission also explains how it intends to monitor depreciation practices.

II. Background

On July 29, 1999, the Commission issued a Notice of Proposed Rulemaking (NOPR) proposing to establish the principles that public utilities and licensees subject to Part 101 must follow in determining depreciation rates for accounting purposes.[1] In the NOPR the Commission noted that it has authority under Section 301 of the Federal Power Act (FPA)[2] over the accounting practices of public utilities and licensees and that, under this Section, it has prescribed a Uniform System of Accounts (USofA)[3] that these jurisdictional entities must follow.

The Commission further noted in the NOPR that it also has authority under Section 302 of the FPA[4] over the depreciation accounting practices of public utilities and licensees and that this authority includes the authority to determine and fix proper and adequate depreciation rates for accounting purposes.

The Commission stated that, in order to fulfill its statutory obligation to ensure that electric utilities charge proper amounts of depreciation to expense in each financial reporting period, it had required public utilities and licensees to obtain Commission approval before changing their depreciation rates for accounting purposes.[5] The Commission noted, however, that a decision of the U.S. Court of Appeals for the District of Columbia Circuit, *Alabama Power Company, et al.* v. *FERC,* 160 F.3d 7 (D.C. Cir. 1998) (*Alabama Power*), overturned the Commission's action in *MidAmerican* on procedural grounds.

The Commission began this rulemaking proceeding to respond to the court's concern that the Commission could not exercise its authority with respect to depreciation accounting matters without first establishing standards. The Commission thus proposed to require utilities[6] to use

[1] Depreciation Accounting, 64 FR 42304 (Aug. 4, 1999); FERC Stats. & Regs., Proposed Regulations ¶ 32,544 (July 29, 1999).

[2] 16 U.S.C. 825.

[3] *See* 18 CFR Part 101.

[4] 16 U.S.C. 825a.

[5] *See* MidAmerican Energy Company, 79 FERC ¶ 61,169 (1997), *reh'g denied,* 81 FERC ¶ 61,081 (1997) (*MidAmerican*).

[6] As in the NOPR, henceforth when we use the word ''utilities'' in this final rule, we intend to

depreciation rates for accounting purposes that were based on the straight-line method of depreciation and the assets' estimated useful lives, the predominant method traditionally used by utilities. The Commission proposed, also, to monitor utility depreciation rates for accounting purposes on a case-by-case basis, *e.g.,* as a result of or in conjunction with complaints or audits. The Commission's proposal to monitor depreciation practices and rates was in lieu of a requirement that utilities make individual filings and obtain prior Commission approval to change their depreciation rates for accounting purposes.

III. Comments Received

The Commission received 20 comments in response to the NOPR.[7] The overwhelming majority of those comments agreed with the Commission's proposal not to require individual utilities to file their accounting depreciation rates with us for our approval.[8] However, they strongly opposed the Commission's proposal to adopt the straight-line method of depreciation to the exclusion of other methods of depreciation that also result in systematically and rationally allocating the cost of utility property to the periods during which the utility uses the property in operations.

Only two Commenters, the Florida Public Service Commission and NARUC, supported the exclusive use of the straight-line method of depreciation,[9] and NARUC asked for clarification of the inconsistency between this proposal and the accelerated cost recovery provisions that we have agreed to consider with respect to new transmission investment.[10] All of the other Commenters opposed exclusive reliance upon the straight-line method of depreciation as the only permissible method of accounting for depreciation in the utility industry.

For example, the Edison Electric Institute (EEI) argued that the proposal is ''inconsistent with the Commission's adopted policies promoting greater competition in electric markets * * * [which require] a flexible approach to depreciation accounting * * *'' [11] EEI notes that in an era of rapid technological change an asset's productivity may vary greatly over its service life. EEI suggests that, under such circumstances, accelerated depreciation will provide a better match of expenses to revenues than would straight-line depreciation. EEI notes that unregulated companies have the advantage of using accelerated depreciation to meet the changing needs of a free market economy; it asks that the Commission make the same advantages available to utilities as they enter the competitive era. [12]

EEI urges the Commission to allow utilities the flexibility to meet the constantly changing conditions of the marketplace by permitting utilities to change the estimated service lives of their capital equipment and to adopt methods of depreciation other than straight-line, if, in their judgment, circumstances warrant. EEI points out that generally accepted accounting principles (GAAP) [13] allows for methods of depreciation other than straight-line that are also systematic and rational ways of accounting for the depreciable life of assets.[14] According to EEI, this flexibility would permit companies to use depreciation schedules that incorporate service lives of varying lengths as well as varying rates of obsolescence. This would allow management to more carefully track costs and cost causation.

EEI submits that the proposed adoption of a straight-line depreciation method of accounting does not meet the reporting needs of a changing industry and runs counter to the Commission's efforts to promote efficient competition by reducing the regulatory and accounting burden on utilities.[15] EEI also observes that the NOPR's proposal for universal straight-line depreciation is inconsistent with the Commission's recent Order No. 2000, in which the Commission indicated that it would consider the application of accelerated depreciation for new transmission investment.[16]

Detroit Edison submits that the Commission ''is being far too prescriptive for an industry in transition and subject to competitive pressures.'' [17] According to Detroit Edison, GAAP mandates only that companies determine depreciation in a systematic and rational manner and recognizes several different methods of accounting for depreciation that would accomplish this.[18] Detroit Edison also argues that straight-line depreciation necessarily defers the recognition of certain costs to future years, when, in a competitive environment, a company charging the higher prices necessary to recover these deferred costs could drive away customers. Detroit Edison submits that other methods of depreciation, such as double or 150-percent declining balance or sum-of-the-years digits depreciation, better match cost accrual with revenues and allow companies the flexibility to survive in a competitive world.[19]

Detroit Edison observes that the straight-line method of accounting for depreciation worked well when there was an obligation to serve and a guarantee of future income because technology changed little and customers had few options. Today, technology is changing rapidly, costs are becoming more differentiated, and choice is becoming the norm. As a result, the assumption that assets will produce a steady stream of revenue throughout their physical lives is no longer valid.

Rather, Detroit Edison submits, the assumption in today's world should be that each asset will produce a different, individual income stream, which will depend on its economic usefulness. Detroit Edison argues that ''accounting should reflect that reality[]'' [20] and help the industry prepare for competition rather than re-enforce existing

encompass both public utilities and licensees; we will refer to ''utilities'' for ease of reading. *See* 18 CFR Part 101, Definition No. 39.

[7] A list of Commenters appears in the Appendix; we will refer to each Commenter by the short form listed there next to each name. The Mississippi Public Service Commission filed a notice of intervention, but did not comment.

[8] FERC Stats. & Regs. ¶ 32,544 at 33,808. *See, e.g.,* EEI at 2.

[9] Florida Public Service Commission at 3; NARUC at 5.

[10] NARUC at 4.

[11] EEI at 2.

[12] EEI at 16.

[13] GAAP encompasses the conventions, rules and procedures necessary to define accepted accounting practices. GAAP incorporates the accounting profession's consensus at a particular time as to which economic resources and obligations companies should record as assets and liabilities, which changes in assets and liabilities they should record, how they should measure assets and liabilities and changes in them, what information they should disclose, how they should disclose it, and what financial statements they should prepare.

[14] EEI at 18–19.

[15] EEI at 4–6.

[16] EEI at 21. In Order No. 2000, the Commission included as one of the innovative rate treatments offered to Regional Transmission Organization (RTO) participants non-traditional depreciation for ratemaking purposes for new transmission investments. RTOs would have to support their proposals with: (a) a detailed explanation of how the proposed rate treatment would help achieve the goals of Regional Transmission Organizations; (b) a cost-benefit analysis, including rate impacts; and (c) a detailed explanation of why the proposed rate treatment is appropriate for the RTO requesting it. *See* 18 CFR 35.34(e)(1), .34 (2)(iii); Regional Transmission Organizations, Order No. 2000, FERC Stats. & Regs. ¶31,089 at 31,194–95, *order on reh'g,* Order 2000–A, FERC Stats. & ❩Regs. ¶31,092 at 31,387–88.

[17] Detroit Edison at 2.

[18] *Id.* at 2, 8.

[19] *Id.*

[20] *Id.* at 10.

regulatory practices. [21] Most of the other Commenters expressed similar views. [22]

IV. Discussion

The Commission's Uniform System of Accounts for electric utilities defines depreciation as the loss of an asset's service value not restored by current maintenance.[23] Some of the causes for the loss in service value include wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand, and requirements of public authorities. The primary objective of recording depreciation expense is to allocate an asset's service value over its remaining useful life. To accomplish this objective the Commission has traditionally used a straight-line depreciation method to allocate an asset's service value over its remaining life.

We thus initially proposed to adopt for accounting purposes the straight-line method of depreciation as our standard. As we noted in the NOPR, straight-line depreciation was the method typically used by utilities.[24] While, in general, we expect that that is likely to continue to be the case for most utility property, commenters have persuaded us that requiring its universal use would be overly prescriptive. The primary objective of depreciation accounting is to allocate in a systematic and rational manner the cost of property to the periods during which the property is used in utility operations, *i.e.,* over its estimated useful service life. As Commenters correctly observe, there are methods of depreciation other than the straight-line method that also meet this objective.

Therefore, we will modify our proposed rule and simply require utilities to use for accounting purposes methods of depreciation that allocate the cost of utility property over its useful service life in a systematic and rational manner. Such methods include not only a straight-line method of depreciation, but other methods of depreciation. The broader systematic and rational standard will ensure that depreciation for accounting purposes is done properly while at the same time allowing flexibility in a changing business environment.

We are not unmindful that this additional flexibility could create a potential for abuse. However, we believe that our monitoring of utility depreciation practices will mitigate that potential. Consequently, as noted in the NOPR, we will not require utilities to make a separate filing to obtain Commission approval before implementing changes in depreciation rates for accounting purposes.[25] Instead, we will monitor utility depreciation practices on a case-by-case basis.[26]

V. Environmental Statement

The Commission excludes certain actions not having a significant effect on the human environment from the requirement to prepare an environmental assessment or an environmental impact statement.[27] The promulgation of a rule that is procedural or that does not substantially change the effect of legislation or regulations being amended raises no environmental considerations.[28] This final rule amends Part 101 of the Commission's regulations and does not substantially change the effect of the underlying legislation or the regulations being revised.

Further, approval of actions under Section 301 of the FPA, relating to accounting orders, also raises no environmental considerations.[29] The instant rule fundamentally involves accounting matters, establishing standardized depreciation accounting practices. Accordingly, no environmental consideration is necessary.

VI. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA), 5 U.S.C. 601–612, requires rulemakings to contain either a description and analysis of the effect that the final rule will have on small entities or a certification that the rule will not have a significant economic impact on a substantial number of small entities.

In *Mid-Tex Elec. Coop.* v. *FERC,* 773 F.2d 327 (D.C. Cir. 1985), the court found that Congress, in passing the RFA, intended agencies to limit their consideration ''to small entities that would be directly regulated'' by proposed rules. *Id.* at 342. The court further concluded that ''the relevant 'economic impact' was the impact of compliance with the proposed rule on regulated small entities.'' *Id.* at 342.

Most public utilities to which this final rule would apply do not fall within

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[21] Id. at 11.

[22] *See, e.g.,* American Institute of Certified Public Accountants at 1, 4; Commonwealth Edison at 1, 3–4, 7 (competition mandates various types of accounting for depreciation, including accelerated depreciation); Consumers Energy at 4–5 (Commission should allow all methods of accounting for depreciation, including accelerated depreciation, that result in a rational and systematic allocation of the cost of a utility's plant); PSE&G at 1 (under certain conditions methods of accounting for depreciation, other than straight-line, provide for a better matching of expenses with revenues); NRECA at 2 (changes in technology often require accelerated depreciation because of rapid obsolescence of assets); Cinergy at 1 (endorses comments of EEI); Allegheny Energy at 1 (the changing needs of the market place are affecting the useful lives of capital equipment and the rate at which equipment is becoming obsolete); Virginia Power at 6 (same); Old Dominion at 2 (GAAP recognizes other methods of accounting for depreciation that result in systematically and rationally recording depreciation expense over an asset's useful life.); AEP at 4 (proposed rule would impose more regulation and record keeping on the utility industry at the very time that it needs far less regulation in order to meet the demands of competition.); Arthur Anderson at 3 (depreciation accounting should be flexible to recognize the economic effects of regulation during the transition to a competitive business environment); Price Waterhouse at 1 (if the expected productivity or revenue-earning power or maintenance requirements vary greatly over the life of an asset, a depreciation method of accounting other than straight-line may more appropriately allocate costs to revenues); First Energy at 2 (the Commission should accept all methods of depreciation, including accelerated depreciation, that are consistent with GAAP); Deloitte & Touche at 2 (same); Southern at 13 (proposal runs counter to Commission's willingness to consider accelerated depreciation for new investment in transmission facilities).

[23] 18 CFR Part 101, Definition No. 12.

[24] *See* 64 FR 42304 (1999); FERC Stats. & Regs. ¶32,544 at 33,806. *See also, e.g.,* J. Suelflow, Public Utility Accounting: Theory and Application 96 (1973) (''Straight line is the predominant method used by utilities and sanctioned by most regulatory bodies.''); Deloitte Haskins & Sells, Public Utilities Manual 23 (1980) (''[T]he straight-line concept is applied almost universally for both accounting and rulemaking. * * *''); C. Phillips, The Regulation of Public Utilities: Theory and Practice 272 (3d ed. 1993) (The straight line method * * * is the simplest and most commonly used.''); L. Hyman, America's Electric Utilities: Past, Present and Future 292 (5th ed. 1994) (''The book depreciation rate is a straight line rate for most utility companies.''); *accord* Depreciation Subcommittee of the NARUC Committee on Engineering, Depreciation, and Valuation of the National Association of Regulatory Utility Commissioners, Public Utility Depreciation Practices 12 (1968) (''In the two decades, since the Report of the Committee on Depreciation of the NARUC was published in 1943, the use of the straight-line method for accounting and rate-making purposes has became almost universal for public utilities.'').

In addition, the FERC Annual Report Form No. 1's appeared to indicate the same.

[25] Our action today authorizes utilities to change their method of depreciation for accounting purposes *only*; it does not authorize any utility to change prices charged for power sales or transmission services (whether determined by stated rates or formula rates) to reflect a change in depreciation.

To change prices charged for power sales or transmission services (whether determined by stated rates or formula rates) to reflect a change in depreciation, a utility would first have to make a filing with us, pursuant to sections 205 or 206, 16 U.S.C. 824d, 824e, as appropriate, to that effect.

[26] As we noted in Midwest Power Systems Inc., 67 FERC ¶ 61,076 at 61,209 (1994), utilities ''most common[ly]'' change their depreciation rates in the context of a rate case. *Accord, id.* at 61,208, n.7.

We expect that utilities will continue to change their depreciation accounting predominantly in the context of rate cases, and that, in fact, changes in depreciation accounting will rarely occur outside of a rate case.

[27] 18 CFR 380.4.

[28] 18 CFR 380.4(a)(2)(ii).

[29] 18 CFR 380.4(a)(16).

the definition of small entity.[30] Consequently, the Commission certifies that this final rule will not have a significant economic impact on a substantial number of small entities.

VII. Public Reporting Burden and Information Collection Statement

The Commission is amending 18 CFR part 101 to establish the principles for determining depreciation rates for accounting purposes. While we are adding an instruction to an information requirement, the instruction is not adding to the information reporting burden because the Commission is not requiring public utilities to do anything more or less than they are already doing to account for depreciation. Accordingly, this final rule does not impose any additional public reporting burden. We are forwarding a copy of this to the Office of Management and Budget for their information.

Interested persons may obtain information on the reporting requirements by contacting the following: Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426 [Attention: Michael Miller, Capital Planning and Policy Group, Phone: (202) 208–1415, Fax: (202) 208–2425, E-mail: mike.miller@ferc.fed.us].

To submit comments concerning collections of information and associated burden estimate(s), please send your comments to the contact listed above and to the Office of Management and Budget, Office of Information and Regulatory Affairs, Washington, DC 20503, [Attention: Desk Officer for the Federal Energy Regulatory Commission, Phone: (202) 395–3087, Fax: (202) 395–7285].

VIII. Document Availability

In addition to publishing the full text of this document in the **Federal Register**, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through FERC's Home Page (*http://www.ferc.fed.us*) and in the Commission's Public Reference Room during regular business hours (8:30 a.m. to 5 p.m. Eastern time) at 888 First Street, NE., Room 2A, Washington, DC 20426.

From FERC's Home Page on the Internet, this information is available in both the Commission Issuance Posting System (CIPS) and the Records and Information Management System (RIMS).

—CIPS provides access to the texts of formal documents issued by the Commission since November 14, 1994.

—CIPS can be accessed using the CIPS link or the Energy Information Online icon. The full text of this document is available on CIPS in ASCII and WordPerfect 8.0 format for viewing, printing, and/or downloading.

—RIMS contains images of documents submitted to and issued by the Commission after November 16, 1981. Documents from November 1995 to the present can be viewed and printed from FERC's Home Page using the RIMS link or the Energy Information Online icon. Descriptions of documents back to November 16, 1981, are also available from RIMS-on-the-Web; requests for copies of these and other older documents should be submitted to the Public Reference Room.

User assistance is available for RIMS, CIPS, and the Website during normal business hours from our Help line at (202) 208–2222, or by E-Mail (to WebMaster@ferc.fed.us) or the Public Reference Room at (202) 208–1371 (E-Mail to public.referenceroom@ferc.fed.us).

During normal business hours, documents can also be viewed and/or printed in FERC's Public Reference Room, where RIMS, CIPS, and the FERC Website are available. User assistance is also available.

IX. Effective Date

This final rule will take effect October 2, 2000. The Commission has determined, with the concurrence of the Administrator of the Office of Information and Regulatory Affairs of the Office of Management and Budget, that this rule is not a ''major rule'' within the meaning of Section 251 of the Small Business Regulatory Fairness Act of 1996.[31] The Commission will submit the Final Rule to both houses of Congress and to the General Accounting Office.[32]

List of Subjects in 18 CFR Part 101

Electric power, Electric utilities, Reporting and recordkeeping requirements, Uniform System of Accounts.

By the Commission.

David P. Boergers,

Secretary.

In consideration of the foregoing, the Commission amends Part 101, Title 18 of the Code of Federal Regulations, as follows.

PART 101—UNIFORM SYSTEM OF ACCOUNTS PRESCRIBED FOR PUBLIC UTILITIES AND LICENSEES SUBJECT TO THE PROVISIONS OF THE FEDERAL POWER ACT

1. The authority citation for Part 101 continues to read as follows:

Authority: 16 U.S.C. 791a–825r, 2601–2645; 31 U.S.C. 9701; 42 U.S.C. 7102–7352, 7651–7651o.

2. In Part 101, General Instructions, paragraph 22 is added to read as follows:

General Instructions

* * * * *

22. *Depreciation Accounting.*

A. *Method.* Utilities must use a method of depreciation that allocates in a systematic and rational manner the service value of depreciable property over the service life of the property.

B. *Service lives.* Estimated useful service lives of depreciable property must be supported by engineering, economic, or other depreciation studies.

C. *Rate.* Utilities must use percentage rates of depreciation that are based on a method of depreciation that allocates in a systematic and rational manner the service value of depreciable property to the service life of the property. Where composite depreciation rates are used, they should be based on the weighted average estimated useful service lives of the depreciable property comprising the composite group.

Note: This appendix will not be published in the Code of Federal Regulations.

Appendix—Commenters

Name	As styled in order
Allegheny Energy, Inc	Allegheny Energy.
American Electric Power Service Corporation (filing on behalf of itself and on behalf of its operating public utility affiliates: Appalachian Power Company, Columbus Southern Power Company, Indiana Michigan Power Company, Kentucky Power Company, Kingsport Power Company, Ohio Power Company and Wheeling Power Company).	AEP.

[30] *See* 5 U.S.C. 601(3), citing to section 3 of the Small Business Act, 15 U.S.C. 632, which defines ''small business concern'' as a business that is independently owned and operated and that is not dominant in its field of operation.

[31] 5 U.S.C. 804(2).

[32] 5 U.S.C. 801(a)(1)(A).

Name	As styled in order
American Institute of Certified Public Accountants	American Institute of Certified Public Accountants.
Arthur Andersen, LLP	Arthur Andersen.
Cinergy Services, Inc.	Cinergy.
Cleco Corporation	Cleco.
Commonwealth Edison Company	Commonwealth Edison.
Consumers Energy Company	Consumers Energy.
Deloitte & Touche LLP	Deloitte & Touche.
Detroit Edison Company	Detroit Edison.
Edison Electric Institute	EEI.
FirstEnergy Corp	FirstEnergy.
Florida Public Service Commission	Florida Commission.
Mississippi Public Service Commission	Mississippi Commission.
National Association of Regulatory Utility Commissioners	NARUC.
National Rural Electric Cooperative Association	NRECA.
Old Dominion Electric Cooperative	Old Dominion.
PricewaterhouseCoopers, LLP	Price Waterhouse.
Public Service Electric & Gas Company of New Jersey	PSE&G.
Southern Company Services, Inc. (acting as agent for Alabama Power Company, Georgia Power Company, Gulf Power Company Mississippi Power Company and Savannah Electric and Power Company (collectively, Southern Company).	Southern.
Virginia Electric and Power Company	Virginia Power.

[FR Doc. 00–19507 Filed 8–2–00; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 514

[Docket No. 99N–2151]

New Animal Drug Applications; Sheep as a Minor Species

AGENCY: Food and Drug Administration, HHS.

ACTION: Final rule.

SUMMARY: The Food and Drug Administration (FDA) is amending its regulations to reclassify sheep as a minor species for all data collection purposes. This reclassification will allow sponsors of new animal drug applications (NADA's) to extrapolate human food safety data from a major species such as cattle to sheep. In particular, this will enable the extrapolation of the tolerances for residues of new animal drugs in cattle to sheep.

DATES: This rule is effective September 5, 2000.

FOR FURTHER INFORMATION CONTACT: Meg Oeller, Center For Veterinary Medicine (HFV–130), Food and Drug Administration, 7500 Standish Pl., Rockville, MD 20855, 301–827–7581, e-mail: moeller@cvm.fda.gov.

SUPPLEMENTARY INFORMATION:

I. Background

In the **Federal Register** of July 26, 1999 (64 FR 40321), FDA published a proposed rule to revise the definition of minor species in § 514.1(d)(1)(ii) (21 CFR 514.1(d)(1)(ii)) by deleting the following language: ''Sheep are a minor species with respect to effectiveness and animal safety data collection requirements; sheep are a major species with respect to human safety data collection requirements arising from the possible presence of drug residues in food.'' This change makes sheep a minor species for all data collection purposes in support of NADA's.

As stated in the preamble to the proposed rule (64 FR 40321), new data that have become available since publication of the minor species final rule (48 FR 1922, January 14, 1983) allow the agency to conclude that sheep should be a minor species with respect to all data requirements. The new data concern the similarity of drug metabolism between sheep and cattle rather than consumption levels. While consumption levels can be a factor in determining whether a species should be classified as major or minor, the agency believes that the body of evidence concerning drug metabolism is more significant in determining the major/minor status of sheep than consumption data because it demonstrates the reliability of data extrapolated from cattle, a major species, to sheep.

II. Comments

FDA received seven comments on the proposed rule, six comments from organizations, and one from an individual. All the comments supported the proposed rule. The following is a summary of the comments:

(Comment 1) Six comments expressed the opinion that this change would lower research and development costs for sponsors seeking approval of new animal drugs for sheep.

(Comment 2) Six comments noted that the sheep industry suffers from a lack of animal drug availability to the detriment of the industry and animal health.

(Comment 3) Four of the comments praised the agency for its science-based approach to this issue.

Thus, FDA is adopting the rule as proposed.

III. Analysis of Impacts

FDA has examined the impacts of the final rule under Executive Order 12866 and the Regulatory Flexibility Act (5 U.S.C. 601–612) (as amended by subtitle D of the Small Business Regulatory Fairness Act of 1996 (Public Law 104–121)), and the Unfunded Mandates Reform Act of 1995 (Public Law 104–4). Executive Order 12866 directs agencies to assess all costs and benefits of available regulatory alternatives and, when regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity). The agency believes that this final rule is consistent with the regulatory philosophy and principles identified in the Executive Order. In addition, the final rule is not a significant regulatory action as defined by the Executive Order and so is not subject to review under the Executive Order.

The Regulatory Flexibility Act requires agencies to analyze regulatory

Appendix E

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA. 17105-3265

Public Meeting held June 18, 2009

Commissioners Present:

James H. Cawley, Chairman
Tyrone J. Christy, Vice Chairman
Kim Pizzingrilli
Wayne E. Gardner
Robert F. Powelson, Statement

Smart Meter Procurement and Installation — Docket No. M-2009-2092655

IMPLEMENTATION ORDER

BY THE COMMISSION:

The Pennsylvania General Assembly ("General Assembly") has directed that electric distribution companies with more than 100,000 customers file smart meter technology procurement and installation plans with the Commission for approval. 66 Pa.C.S. § 2807(f). This Implementation Order will establish the standards each plan must meet and provide guidance on the procedures to be followed for submittal, review and approval of all aspects of each smart meter plan. This Implementation Order will also establish minimum smart meter capability and guidance on the Commission's expectations for deployment of smart meters.

BACKGROUND AND HISTORY OF THIS PROCEEDING

Governor Edward Rendell signed Act 129 of 2008 ("the Act" or "Act 129") into law on October 15, 2008. The Act took effect 30 days thereafter on November 14, 2008. Among other things, the Act specifically directed that within nine months of its effective date, electric distribution companies ("EDCs") are to file, with the Commission for approval, a smart meter technology procurement and installation plan. 66 Pa.C.S. § 2807(f)(1). Each EDC smart meter plan must describe the smart meter technologies the EDC proposes to install, upon request from a customer at the customer's expense, in new construction and in accordance with a depreciation schedule not to exceed 15 years. 66 Pa.C.S. §§ 2807(f)(1) and (2). The Act also establishes a requirement for EDCs to make available to third parties direct meter access and electronic access to meter data by third parties, upon customer consent. 66 Pa.C.S. § 2807(f)(3). The Act further defines minimum smart meter technology capabilities. 66 Pa.C.S. § 2807(g). Finally, the Act establishes acceptable cost recovery methods. 66 Pa.C.S. § 2807(7).

On March 30, 2009, the Commission issued a Secretarial Letter seeking comments on a draft staff proposal and additional questions regarding EDC smart meter procurement and installation. Comments were due by April 15, 2009, with reply comments due April 27, 2009. On April 9, 2009, the Commission, at the request of several interested parties, issued a Secretarial Letter extending the comment period to April 20, 2009 and the reply comment period to April 29, 2009.

The following parties filed comments: West Penn Power Company d/b/a Allegheny Power ("Allegheny"); Citizen Power ("Citizen"); Constellation NewEnergy, Inc. ("Constellation"); Duquesne Light Company ("Duquesne"); Elster Integrated Solutions ("Elster"); The Energy Association of Pennsylvania ("EA"), Exelon Energy ("Exelon"); Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company (collectively "FirstEnergy"); the Industrial Energy

Consumers of Pennsylvania ("IECPA"); Office of Consumer Advocate ("OCA"); PECO Energy Company ("PECO"); PPL Electric Utilities Corporation ("PPL"); Sensus Metering Systems ("Sensus"); Tendril Networks, Inc. ("Trendril"); and Trilliant, Inc. ("Trilliant"). The following parties filed reply comments: Duquesne; EA; FirstEnergy; IECPA; PECO; and PPL.[1]

DISCUSSION

In this section the Commission will outline the standards each plan must meet and provide guidance on the procedures to be followed for submittal, review and approval of all aspects of each smart meter plan. This section will also establish guidance on the Commission's expectations for the deployment of smart meters, as well as minimum smart meter capabilities. This section will also describe requirements regarding access to smart meters and data. Finally, in this section the Commission will provide guidance on EDC smart meter technology cost recovery.

A. Plan Approval Process

Within nine months after the effective date of Act 129, each EDC with more than 100,000 customers is to file a smart meter technology procurement and installation plan with the Commission for approval. 66 Pa.C.S. §§ 2807(f)(1) and (6). As Act 129 became effective on November 14, 2008, the smart meter plans must be submitted on or before August 14, 2009. Each smart meter plan shall include: a summary of the EDC's current deployment of smart meter technology, if any; a plan for future deployment, complete with dates for key milestones and measurable goals; and such other information as is required by this Order. The plans shall be served on the Office of Consumer

[1] Wal-Mart Stores East, LP and Sam's East Inc. filed a Petition for Extension of Time to file reply comments, which this Commission denied in a letter dated May 6, 2009. While we rejected Wal-Mart's and Sam's petition, we did receive and consider their reply comments submitted on May 1, 2009.

meters that are being replaced with smart meters in accordance with an approved plan. The Commission believes it would add unreasonable and unnecessary costs to require the EDCs to test every meter removed for the purposes of upgrading to a smart meter.

3. New Construction

As with all equipment, meters have a useful life. EDCs determine how much to invest in meter equipment based on its useful life and have an opportunity to depreciate that investment over the useful life of the meter. In addition, EDCs have an opportunity to recover the cost of the meter from ratepayers. Therefore, if a meter is replaced prior to the end of its useful life, the EDC will not be able to take advantage of the full depreciation of that meter or the ratepayers will pay an increased rate to cover the cost of both meters. The Commission believes that the intent of the Act's provision for installing smart meters in new construction was to avoid this waste and added expense.

Again, the Commission will not require deployment of smart meters in new construction during an EDC's approved network grace period. However, the Commission will direct all covered EDCs to develop a plan to install smart meters in new construction that is begun after the network grace period. Therefore, the Commission directs each covered EDC to include in its smart meter plan a proposal for deployment of smart meters in new construction. Such a proposal should include a plan to identify new developments and construction early enough to incorporate it into the system-wide deployment proposal.

Several parties commented on the proposed rollout of smart meters in new construction. OCA posits that smart meters should be installed on new construction from the beginning, even during the network installation grace period. OCA asserts that while the smart meters will not be fully functional, the smart meters should still be able to provide the necessary billing data. FirstEnergy, PECO and PPL disagree, noting that

4. System-Wide Deployment

The Commission believes that it was the intent of the General Assembly to require all covered EDCs to deploy smart meters system-wide when it included a requirement for smart meter deployment "in accordance with a depreciation schedule not to exceed 15 years." It is this system-wide deployment that will provide the foundation for the EDCs' smart meter installation plans. Therefore, it is crucial for the EDCs to develop a plan that will best meet the needs of their service territory, while at the same time operating in a manner that is both cost and time effective.

The EDCs shall detail their system-wide deployment plans to the Commission, including any type of tiered rollout the company proposes, as well as the associated costs and benefits incurred from such a rollout. This system-wide plan should also incorporate a coordination element with the new construction deployment component. Furthermore, the Commission will require all EDCs to file a "Smart Meter Progress" report on an annual basis that will update the status of their installation plans, including the number of customers who received meters in the prior year, the estimated number of customers scheduled to receive meters in the coming year, and all costs associated with the meter plan incurred during the previous year.

It should also be noted that Act 129 uses the language "not to exceed 15 years." An EDC is encouraged to expedite the deployment process if it will provide increased customer benefits in a cost-effective manner. Again, the primary goal of the EDC deployment plan should be to implement a deployment and installation schedule that best balances the overall efficiency and timeliness of the smart meter installations with the costs incurred.

OCA commented that the Commission needs to clarify whether the 15 year depreciation schedule outlined in Act 129 commences upon plan approval or following

Act 129 allows an EDC to recover reasonable and prudent costs of providing smart meter technology, to include annual depreciation and capital costs over the life of the smart meter technology and the cost of any system upgrades required to enable the use of the smart meter technology, incurred after November 14, 2008, less operating and capital cost savings realized by the electric distribution company from the installation and use of the technology. Smart meter technology is deemed to be a new service offered for the first time under Section 2804(4)(vi).

1. Cost Recovery Mechanism

An EDC may recover smart meter technology costs through (1) base rates, including a deferral for future base rate recovery of current basis with carrying charge as determined by the Commission; or (2) on a full and current basis through a reconcilable automatic adjustment clause under Section 1307. 66 Pa.C.S. § 2807(f)(7). However, in no event shall lost or decreased revenues by an EDC due to reduced electricity consumption or shifting energy demand be considered a cost of the smart meter technology recoverable under a reconcilable automatic adjustment clause under Section 1307(b), except that decreased revenues and reduced energy consumption may be reflected in the revenue and sales data used to calculate rates in a subsequent distribution rate base rate proceeding filed under Section 1308 (relating to voluntary change in rates), or a recoverable cost. 66 Pa.C.S. § 2807(f)(4).

Act 129 allows an EDC to recover "all reasonable and prudent costs of providing smart meter technology." In order to determine what these costs are, each EDC will document all costs relating to its smart meter deployment and installation plan. These costs will include both capital and expense items relating to all plan elements, equipment and facilities, as well as an analysis of all related administrative costs. More specifically, these costs would include, but not be limited to, capital expenditures for any equipment and facilities that may be required to implement the smart meter plan, as well as

depreciation, operating and maintenance expenses, a return component based on the EDC's weighted cost of capital, and taxes. Administrative costs would include, but not be limited to, incremental costs relating to plan development, cost analysis, measurement and verification, and reporting. In addition, the plan should include cost estimates for testing, upgrades, maintenance and personnel training. The EDC must also provide sufficient support to demonstrate that all such costs are reasonable and prudent with respect to its smart meter plan. Consistent with Section 315(a), the burden of proof shall be on the EDC. 66 Pa.C.S. § 315(a).

The Commission recognizes that some of the requirements for smart meters outlined in Section C of this Order go beyond the minimum requirements set forth in Act 129. In order to ensure that these additional smart meter functions are cost-effective, we direct that each smart meter plan filing include cost data that quantifies the costs to meet the minimum requirements set forth in Act 129, the costs to meet all of the requirements set forth in Section C above, and the individual incremental costs of each added function, less any operating and capital cost savings. Specifically, we direct that the plan filing shall quantify the costs to deploy and operate smart meter technology that is capable of the following minimum requirements set forth in 66 Pa.C.S. § 2807(g):

- Bidirectional data communications.
- Recording usage data on at least an hourly basis once per day.
- Providing customers with direct access to and use of price and consumption information.
- Providing customers with information on their hourly consumption.
- Enabling time-of-use rates and real-time price programs.
- Supporting the automatic control of the customer's electric consumption.

In addition, each plan filing shall include the individual incremental costs for deploying and operating the following smart meter technology capabilities:

Appendix F

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA. 17105-3265

Public Meeting held December 19, 2019

Commissioners Present:

Gladys Brown Dutrieuille, Chairman
David W. Sweet, Vice Chairman
Andrew G. Place
John F. Coleman, Jr.
Ralph V. Yanora

2021 Total Resource Cost (TRC) Test M-2019-3006868

FINAL ORDER

BY THE COMMISSION:

Act 129 of 2008, 66 Pa. C.S. § 2806.1, directs the Pennsylvania Public Utility Commission (Commission) to analyze the benefits and costs of the energy efficiency and conservation (EE&C) plans that certain electric distribution companies (EDCs) are required to file. Our September 19, 2019 *2021 TRC Test Tentative Order* at this docket proposed methodology and requested comments on a 2021 TRC Test for use in planning for and during a potential Phase IV of Act 129. This Order finalizes the specific refinements to the 2021 TRC Test for use in Phase IV of Act 129, that, if approved, would begin June 1, 2021.[1]

[1] The currently assigned docket for matters relating to the Commission's consideration of a potential Phase IV is *Release of the Act 129 [Phase III SWE] Energy Efficiency Baseline Studies*, Docket No. M-2019-3006866. The 2021 Technical Reference Manual (TRM) is at Docket No. M-2019-3006867.

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b. Disposition

Stakeholders were generally supportive of our proposal to disassociate the Act 129 discount rate from an EDC's WACC. Our proposal of a 3% real discount rate (5% nominal discount rate) is lower than EDC WACC values used in prior phases of Act 129. PA-EEFA and KEEA supported the direction and rationale for the change. Although neither the Industrials nor OSBA recommend a specific Act 129 discount rate, they aver that a rate higher than an EDC's WACC would be appropriate.

Contrary to OSBA's suggestion, Act 129 programs are, in fact, a government policy designed to encourage investments in energy efficiency that would not happen absent policy intervention. Accordingly, the 3% real discount rate will be used for Phase IV of Act 129.

5. Effective Useful Life

As established in Act 129 and as discussed in prior TRC Test Orders, any given measure is limited to a maximum of 15 years of savings benefits. 66 Pa. C.S. § 2806.1(m). Measures with recurring costs, such as increased natural gas consumption for CHP projects, are also limited to 15 years of negative benefits. Typically, the costs of energy efficiency are front-loaded, and the benefits accrue over many years. The National Standard Practice Manual (NSPM) addresses the issue imposed by capped measure life assumptions as "end effects"[31] and suggests a methodology whereby costs are reduced proportionately to truncated lifetime benefits. The position of the Commission is that end effects adjustments such as the ones proposed in the NSPM are not acceptable for use in Phase IV. While certain technologies may have an expected useful life greater than 15 years, Act 129 is clear about the 15-year limit, and any adjustment to the cost ledger would circumvent the legislative directive. Therefore, we saw no reason to propose any changes for this provision.

[31] *See* https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf page 91.

Appendix G

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

METROPOLITAN EDISON COMPANY
DOCKET NO. M-2013-2341990

PENNSYLVANIA ELECTRIC COMPANY
DOCKET NO. M-2013-2341994

PENNSYLVANIA POWER COMPANY
DOCKET NO. M-2013-2341993

WEST PENN POWER COMPANY
DOCKET NO. M-2013-2341991

SMART METER DEPLOYMENT PLAN

ORIGINAL DECEMBER 31, 2012
REVISED MARCH 19, 2014
REVISED JUNE 16, 2014

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Book and Tax Depreciation

Each of the cost categories were assessed to determine if they were capital or O&M related costs. For Capex, the estimated book lives used for depreciation purposes were 15 year for smart meters and communications equipment, 5 years for hardware and 7 years for software. Book lives were determined based on input from external resources and internal subject matter experts while tax lives were based on IRS guidelines.

Escalation Rate

The Financial Model assumes an escalation rate of 2.56% for labor.[13] A zero percent escalation rate was assumed for equipment and material costs in recognition that material costs may increase over time while technology costs may decrease over time.

Weighted Average Cost of Capital ("WACC")

The Financial Model assumes the following Weighted Average Cost of Capital rates:

Figure 4.2. Weighted Average Cost of Capital by Company

8.17%	8.68%	9.14%	11.29%

The weighted average cost of capital for Met-Ed, Penelec and Penn Power is calculated in accordance with the Commission order entered June 9, 2010 at Docket No. M-2009-2123950 approving the Joint Petition for Approval of Smart Meter Technology Procurement and Installation Plan. The weighted average cost of capital for West Penn is calculated in accordance with Commission order entered June 30, 2011 at Docket No. M-2009-2123951 approving the Amended Joint Petition for Settlement of All Issues.

The Companies also assessed the project from the residential customer's perspective utilizing a discount rate of .37%, which represents a current typical interest rate for a one-year Certificate of Deposit (CD)[14]. This analysis is discussed in Chapter 4.

[13] Provided by the Companies Business Analytics department based on the average 12 month (Mar 2011 - Mar 2012) escalation index for the Utility industry being 2.56% from U.S. Bureau of Labor Statistics (http://data.bls.gov/cgi-bin/print.pl/news.release/eci.t09.htm)

[14] Based upon the average of the initial Local Results Range for one year certificates of deposit for the Reading, Pennsylvania area as of March 10, 2014.

Legacy Meters

For meters that are removed or become obsolete due to the installation of smart meters ("Legacy Meters"), the Companies propose to retire the meters out of stock, continue their existing depreciation schedule unaltered over their remaining lives as a regulatory asset, and continue cost recovery through base rates. The rate base equivalent of the regulatory asset for Legacy Meters plus the Cost of removal net of Salvage will continue to be included in the respective Company's rate base. This protocol would have no current impact on customer rates. For accounting purposes, the Companies are asking the Commission to approve an accounting treatment that would allow them to create a "regulatory asset" for the Legacy Meters with a recovery schedule equal to the remaining depreciable lives of the assets per the Companies' depreciation records.

Appendix H

Pennsylvania General Assembly

https://www.legis.state.pa.us/cfdocs/billInfo/bill_history.cfm?syear=2007&sind=0&body=H&type=B&bn=2200

08/30/2021 02:52 PM

Bill Information - History

House Bill 2200; Regular Session 2007-2008

Sponsors: GEORGE, McCALL, BELFANTI, CALTAGIRONE, CONKLIN, DALEY, N. P. GOODMAN, HARHAI, HARKINS, KULA, MANDERINO, McGEEHAN, VITALI, J. WHITE, WALKO, SURRA, DeLUCA, DERMODY, GRUCELA, JOSEPHS, JAMES, GINGRICH, FREEMAN, K. SMITH, McILVAINE SMITH, YOUNGBLOOD and FRANKEL

Printer's No.(PN): 4526* , 4429, 3233, 3218, 3176, 3089

Short Title: An Act amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, further providing for director of operations, secretary, employees and consultants; repealing provisions relating to office of trial staff; further providing for bureaus and offices; providing for other bureaus, offices and positions; further providing for electric utility definitions; providing for energy efficiency and conservation program and for energy efficiency and conservation; further providing for duties of electric distribution companies and for market power remediation; and providing for procurement, for additional alternative energy sources and for carbon dioxide sequestration network.

Actions:

PN 3089	Referred to CONSUMER AFFAIRS, Jan. 15, 2008
PN 3176	Reported as amended, Feb. 5, 2008
	First consideration, Feb. 5, 2008
	Laid on the table, Feb. 5, 2008
	Removed from table, Feb. 5, 2008
	Re-committed to APPROPRIATIONS, Feb. 5, 2008
	Re-reported as committed, Feb. 11, 2008
PN 3218	Second consideration, with amendments, Feb. 11, 2008
	(Remarks see House Journal Page 386-403), Feb. 11, 2008
PN 3233	Third consideration, with amendments, Feb. 12, 2008
	Final passage, Feb. 12, 2008 (152-45)
	(Remarks see House Journal Page 430-432), Feb. 12, 2008
	In the Senate
	Referred to CONSUMER PROTECTION AND PROFESSIONAL LICENSURE, Feb. 20, 2008
PN 4429	Reported as amended, Sept. 23, 2008
	First consideration, Sept. 23, 2008
	Second consideration, Sept. 24, 2008
	Re-committed to CONSUMER PROTECTION AND PROFESSIONAL LICENSURE, Sept. 24, 2008
PN 4526	Re-reported as amended, Oct. 7, 2008
	Re-referred to APPROPRIATIONS, Oct. 7, 2008
	Re-reported as committed, Oct. 7, 2008
	Third consideration and final passage, Oct. 8, 2008 (47-3)
	(Remarks see Senate Journal Page 2626-2631), Oct. 8, 2008
	In the House
	Referred to RULES, Oct. 8, 2008

Reported as committed, Oct. 8, 2008

House concurred in Senate amendments, Oct. 8, 2008 (186-4)

(Remarks see House Journal Page 2323-2328), Oct. 8, 2008

Signed in House, Oct. 8, 2008

Signed in Senate, Oct. 8, 2008

Presented to the Governor, Oct. 9, 2008

Approved by the Governor, Oct. 15, 2008

Act No. 129

* denotes current Printer's Number

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Appendix I

PRIOR PRINTER'S NOS. 3089, 3176 PRINTER'S NO. 3218

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE BILL

No. 2200 Session of 2008

INTRODUCED BY GEORGE, McCALL, BELFANTI, CALTAGIRONE, CONKLIN, DALEY, GOODMAN, HARHAI, HARKINS, KULA, MANDERINO, McGEEHAN, VITALI, J. WHITE, WALKO, SURRA, DeLUCA, DERMODY, GRUCELA, JOSEPHS, JAMES, GINGRICH, FREEMAN, K. SMITH, McILVAINE SMITH, YOUNGBLOOD AND FRANKEL, JANUARY 15, 2008

AS AMENDED ON SECOND CONSIDERATION, HOUSE OF REPRESENTATIVES, FEBRUARY 11, 2008

AN ACT

Amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, PROVIDING FOR RECOVERY OF CERTAIN LABOR RELATIONS EXPENSES; further providing for definitions; ~~and~~ providing for adoption of energy efficiency and demand-side response; AND FURTHER PROVIDING FOR DUTIES OF ELECTRIC DISTRIBUTION COMPANIES. <--

The General Assembly of the Commonwealth of Pennsylvania hereby enacts as follows:

~~Section 1. Section 2803 of Title 66 of the Pennsylvania Consolidated Statutes is amended by adding definitions to read:~~ <--

SECTION 1. TITLE 66 OF THE PENNSYLVANIA CONSOLIDATED STATUTES IS AMENDED BY ADDING A SECTION TO READ: <--

§ 1329. RECOVERY OF CERTAIN LABOR RELATIONS EXPENSES.

NO PUBLIC UTILITY MAY CHARGE ITS CUSTOMERS AS A PERMISSIBLE OPERATING EXPENSE FOR RATEMAKING PURPOSES ANY PORTION OF THE DIRECT OR INDIRECT COST OF MEETINGS, PUBLICATIONS, CONSULTANTS, ATTORNEYS OR OTHER PROFESSIONAL SERVICES AND EXPENSES ASSOCIATED WITH THE UTILITY'S EFFORTS TO DISSUADE THE EMPLOYEES OF THE UTILITY, OR THE EMPLOYEES OF ANY AFFILIATED INTEREST OF THE UTILITY AS DEFINED IN SECTION 2101 (RELATING TO DEFINITION OF AFFILIATED INTEREST), FROM BECOMING OR REMAINING A MEMBER IN, OR OTHERWISE BEING REPRESENTED BY, ANY LABOR UNION.

SECTION 2. SECTION 2803 OF TITLE 66 IS AMENDED BY ADDING DEFINITIONS TO READ:

§ 2803. Definitions.

The following words and phrases when used in this chapter shall have the meanings given to them in this section unless the context clearly indicates otherwise:

"Affiliated interest." As defined in section 2101 (relating to definition of affiliated interest).

* * *

"Cost effective." In relation to a program being evaluated, satisfaction of the total resource cost test.

* * *

"Demand-side response." Load management technologies, management practices or other strategies employed by retail customers that decrease peak electricity demand or shift demand from on-peak to off-peak periods provided that:

(1) The measure is installed on or after the effective date of this section at the service location of a retail customer.

(2) The measure reduces the peak demand or cost of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

* * *

"Energy efficiency." Technologies, management practices or

other strategies or measures employed by retail customers that reduce electricity consumption provided that:

(1) The measure is installed on or after the effective date of this definition at the service location of a retail customer.

(2) The measure reduces the consumption of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

"Independent entity." An entity with no direct or indirect ownership, partnership or other affiliated interest with an electric distribution company.

"Peak demand." The highest electrical requirement occurring during a specified period. For an electric distribution company, the term means the sum of the metered consumption for all retail customers over that period.

* * * <--

"REAL-TIME PRICE." A RATE THAT DIRECTLY REFLECTS THE <--
DIFFERENT COST OF ENERGY DURING EACH HOUR.

* * *

"SMART METER TECHNOLOGY." TECHNOLOGY, INCLUDING, BUT NOT LIMITED TO, METERING TECHNOLOGY AND NETWORK COMMUNICATIONS TECHNOLOGY CAPABLE OF BIDIRECTIONAL COMMUNICATION AND THAT RECORDS ELECTRICITY USAGE ON AT LEAST AN HOURLY BASIS, INCLUDING RELATED ELECTRIC DISTRIBUTION SYSTEM UPGRADES TO ENABLE THE TECHNOLOGY. THE TECHNOLOGY SHALL PROVIDE CUSTOMERS WITH DIRECT ACCESS TO AND USE OF PRICE AND CONSUMPTION INFORMATION. THE TECHNOLOGY SHALL ALSO:

(1) DIRECTLY PROVIDE CUSTOMERS WITH INFORMATION ON THEIR

HOURLY CONSUMPTION.

(2) ENABLE TIME-OF-USE RATES AND REAL-TIME PRICE PROGRAMS.

(3) EFFECTIVELY SUPPORT THE AUTOMATIC CONTROL OF THE CUSTOMER'S ELECTRICITY CONSUMPTION BY ONE OR MORE OF THE FOLLOWING AS SELECTED BY THE CUSTOMER:

(I) THE CUSTOMER;

(II) THE CUSTOMER'S UTILITY; OR

(III) A THIRD PARTY ENGAGED BY THE CUSTOMER OR THE CUSTOMER'S UTILITY.

"TIME-OF-USE RATE." A RATE THAT REFLECTS THE COSTS OF SERVING CUSTOMERS DURING DIFFERENT TIME PERIODS, INCLUDING OFF-PEAK AND ON-PEAK PERIODS, BUT NOT AS FREQUENTLY AS EACH HOUR.

"Total resources cost test." A standard test that is met if, over the effective life of the program, the avoided supply-side monetary costs are greater than the monetary costs of the demand-side programs borne by both the electric distribution company and the participants.

* * *

Section ~~2~~ 3. Title 66 is amended by adding a section to <--
read:

§ 2806.1. Adoption of procedures encouraging energy efficiency and demand-side response.

(a) Program.--The commission shall develop a program to provide for the implementation of cost-effective programs that reduce energy demand and consumption within the service territories of all electric distribution companies throughout this Commonwealth. The program shall include, but is not limited to, the following:

(1) Selecting a program administrator to develop and

oversee the delivery of energy efficiency and demand-side response programs within the service territory of each electric distribution company within this Commonwealth.

(2) Implementing the necessary administrative and financial mechanisms that will enable the program administrator to develop and oversee the provision of energy efficiency and demand-side response programs within the service territory of each electric distribution company within this Commonwealth, including the levying of assessments in accordance with sections 510 (relating to assessment for regulatory expenses upon public utilities), 1307 (relating to sliding scale of rates; adjustments) and 1308 (relating to voluntary changes in rates). The commission shall not approve or implement and shall not assess or charge to customers the costs of energy efficiency or demand-response programs to the extent that the costs of such programs exceed 2% of the total annual revenues of the electric distribution company ~~in whose service territory the programs are implemented.~~ FROM ALL SOURCES, INCLUDING DEFAULT SERVICE GENERATION REVENUES AS OF JANUARY 1, 2007. This funding limit shall not include amounts provided for by the low-income usage reduction programs established under regulations at 52 Pa. Code Ch. 58 (relating to residential low income usage reduction programs). <-- <--

(3) Implementing the necessary administrative and financial mechanisms that facilitate a system of third-party entities to deliver all or portions of the energy efficiency and demand-side response programs within the service territory of each electric distribution company within this Commonwealth, including the levying of assessments in

accordance with sections 510, 1307 and 1308. The commission may order the electric distribution company to pay the third-party entity for services rendered in an electric distribution company's respective service territory pursuant to this section. The electric distribution company may be a third-party entity.

(b) Selection of program administrator.--The commission shall implement the following procedures when selecting a program administrator:

(1) The commission shall prepare a request for proposals for a program administrator to provide for the development and delivery of the energy efficiency and demand-side response programs in the service territories of all electric distribution companies and shall make the request for proposals available for public comment.

(2) The commission shall, within 60 days of the completion of the public comment period, issue the final request for proposals.

(3) The commission shall, based on a competitive bid process, select an independent entity to serve as the energy efficiency and demand-side response program administrator.

(4) The commission shall include as a part of its agreement with the program administrator a system of performance parameters and a financial mechanism that provides incentives for exceeding established performance parameters and penalties for third parties not meeting established performance parameters.

(c) Powers and duties of program administrator.--The program administrator shall have powers and duties assigned by the commission. The powers and duties shall include, but not be

limited to:

(1) Soliciting through a competitive procurement process within each electric distribution company service territory a program of providing energy efficiency and demand-side response programs to residential, commercial and industrial customers utilizing third-party entities.

(2) Ensuring that each proposal includes, but is not limited to:

(i) A clear delineation of how the program will be conducted.

(ii) The types of specific program measures to be offered.

(iii) The cost and benefit of each program to be offered.

(iv) A process for monitoring and verifying results, data collection and management procedures, program evaluation processes and financial management strategies.

(3) In its review of each proposal received:

(i) Taking into account the unique circumstances of each electric distribution company's service territory.

(ii) Finding that each program is cost effective and that the portfolio of programs is designed to provide every affected customer class with the opportunity to participate and benefit economically.

(iii) Determining the cost-effectiveness of energy efficiency and demand-side response measures using the total resource cost test.

(4) Recommending to the commission those entities best suited to provide energy efficiency and demand-side response programs within the service territory of each electric

distribution company.

(5) In the event no qualified proposals are received that meet the required plan goals in an electric distribution company service territory to conduct the program activities:

(i) Issuing a subsequent request for proposals with plan goals that are reduced no more than necessary to obtain qualified proposals to provide program activities. The lowered plan goals for energy efficiency and demand-side response shall only be in effect for that year.

(ii) In subsequent years, utilizing the plan goals unless no qualified proposals are received to conduct the program activities that meet the plan goals, the program administrator shall issue a subsequent request for proposals in accordance with the procedures identified in this subparagraph.

(6) Executing agreements on behalf of the commission with the selected entity in each electric distribution company service territory to conduct the energy efficiency and demand-side response program. As part of these agreements the program administrator shall ensure that:

(i) The programs offered by the selected entity are provided equitably across all customer classes.

(ii) A clearly defined process for financial compensation for the entity delivering the program which is tied to defined goals for performance regarding program activities accomplished, energy cost savings on a per-customer basis and utility-wide basis and overall energy and peak demand reduction is established.

(iii) A system of incentives and penalties for performance of contractual activities above and below

predetermined levels is in place.

(iv) There is a set contract term which may include an initial three-year term with renewal terms of varied length.

(7) Submitting reports to the commission at such times and in such manner as the commission directs.

(d) Commission review of recommendations.--The commission shall review the recommendations made by the program administrator regarding those entities best suited to provide energy efficiency and demand-side response programs within the service territory of each electric distribution company. The commission shall approve or disapprove the recommendations made by the program administrator.

(1) The commission review of the recommendations of the program administrator shall be limited to ensuring that:

(i) There is no evidence of fraud or market abuse.

(ii) Any costs entered into are borne by the appropriate parties and that costs, including the costs of subsection (c)(6)(iv) incentives, related to the provision of the contracted services are borne by the appropriate customer class.

(iii) There will be provided, in a cost-effective manner, a program that provides energy efficiency and demand-side response measures to all customer classes throughout the service territory of each electric distribution company.

(2) If the commission approves a third-party entity to conduct the program, the commission shall ensure the program administrator finalizes the agreement between the commission and the third-party entity selected to provide the program of

energy efficiency and demand-side response.

(3) In the event the commission disapproves the recommendation of the program administrator, the commission shall provide a rationale for this decision and direct the program administrator on a course of action.

(e) Plan goals.--The program administrator shall ensure that each proposal submitted by a third-party entity to deliver a program of energy efficiency and demand-side response measures includes meeting the following energy saving goals:

(1) The following relate to energy efficiency goals:

(I) BY MAY 31, 2011, TOTAL ANNUAL DELIVERIES TO RETAIL CUSTOMERS OF ELECTRIC DISTRIBUTION COMPANIES SHALL BE REDUCED BY A MINIMUM OF 1%. THIS LOAD REDUCTION SHALL BE MEASURED AGAINST THE EXPECTED LOAD FORECASTED BY THE COMMISSION FOR JUNE 1, 2010, THROUGH MAY 31, 2011, BASED ON LOAD FOR THE PERIOD JUNE 1, 2007, THROUGH MAY 31, 2008, WITH PROVISION MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOAD THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE. THE COMMISSION SHALL DETERMINE AND MAKE PUBLIC THE FORECASTS TO BE USED FOR EACH ELECTRIC DISTRIBUTION COMPANY NO LATER THAN AUGUST 31, 2008. THE PROGRAM ADMINISTRATOR SHALL ENSURE THAT A THIRD-PARTY ENTITY MEETS THE GOALS CONTAINED IN THIS SECTION THROUGH THE IMPLEMENTATION OF A PROGRAM OF ENERGY EFFICIENCY MEASURES THROUGHOUT THE SERVICE TERRITORY OF THE ELECTRIC DISTRIBUTION COMPANY. <--

~~(i)~~ (II) By May 31, 2013, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 2.5%. ~~, with provision made for weather adjustments and extraordinary load that the~~ <--

~~electric distribution company must serve.~~ This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2012, through May 31, 2013, based on load for the period June 1, 2007, through May 31, 2008, WITH PROVISION MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOAD THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE. The commission shall determine and make public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third-party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company. <--

~~(ii)~~ (III) By November 30, 2013, the program administrator shall evaluate the costs and benefits of these energy efficiency and conservation programs. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the program administrator, in consultation with the commission, shall set additional, incremental energy efficiency and conservation goals for the period ending May 31, 2018. <--

~~(iii)~~ (IV) After May 31, 2018, the program administrator shall continue to evaluate the costs and <--

benefits of efficiency and conservation measures and, in consultation with the commission, may adopt additional incremental load reduction standards for electric distribution companies.

(2) The following relate to demand-side response measures:

(i) Cost-effective demand-side response measures to reduce peak demand by a minimum of 4% in the 100 hours of highest demand with provision made for weather adjustments and extraordinary load that the electric distribution company must serve shall be implemented in each electric distribution company's service territory. This reduction will be measured against the electric distribution company's peak demand in the 100 hours of greatest demand for June 1, 2007, through May 31, 2008. The reductions shall be accomplished by May 31, 2012.

(ii) By November 30, 2012, the program administrator shall compare the total costs of these demand-side response measures to the total savings in energy and capacity costs to retail customers of this Commonwealth. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the commission shall order additional peak demand reductions for the 100 hours of greatest demand or an alternative measure adopted by the commission. The reductions shall be measured from the electric distribution company's peak demand for the period from June 1, 2011, through May 31, 2012. The mandated reductions shall be accomplished no later than May 31, 2017.

(iii) After May 31, 2017, the program administrator shall continue to evaluate the costs and benefits of demand-side response measures and may, in consultation with the commission, adopt additional incremental peak load reduction standards.

(f) Measurements and verification.--The commission shall establish standards by which the program administrator submits

to the commission an annual report, which includes that information relating to the actions and results of the energy efficiency and demand-side response programs undertaken within each electric distribution service territory by each third-party entity.

(1) The report shall include, but not be limited to:

(i) Documentation of program expenditures.

(ii) Measurement and verification of savings resulting from programs.

(iii) Evaluation of the cost-effectiveness of expenditures.

(iv) Any other information the commission may require pursuant to its rulemaking authority.

(2) The program administrator, upon consultation with the commission, shall direct a third-party entity to modify or terminate a particular energy efficiency or a demand-side response program if, after an adequate period for implementation of the program, the commission determines the program is not sufficiently meeting its goals and purposes.

(3) In the event an energy efficiency or demand-side response program is terminated, the program administrator shall require the third-party entity to submit a revised program describing the actions to be undertaken to either offer a substitute program or increase the availability of existing programs to make up for the effect of the terminated program on its overall program goals.

(g) Responsibilities of electric distribution companies.--Each electric distribution company that does not seek to be a third-party entity shall:

(1) Cooperate with the program administrator as needed

in its efforts to competitively procure the services of a third-party entity to provide an energy efficiency and demand-side response program within the service territory of the electric distribution company.

(2) Provide information necessary to effectively facilitate the work of the selected third-party entity in conducting the energy efficiency and demand-side response program.

(3) Provide assistance as may be requested by the program administrator in reviewing proposals from third-party entities seeking to provide energy efficiency and demand-side response programs within their service territories.

(4) Provide assistance as may be requested by the program administrator to facilitate the successful execution of the contract agreement with the third-party entities to provide an energy efficiency and demand-side response program within their service territories.

(h) Recovery of administrative and program costs.--An electric distribution company may fully recover all administrative costs, including, but not limited to, costs incurred under subsections (a)(3) and (g)(1), (2), (3) and (4), that the commission determines are prudently incurred and reasonable in amount pursuant to implementing a program to deliver cost-effective energy efficiency and demand-side response activities through a third-party entity. Program and administrative costs shall be recovered on a full and current basis by the electric distribution company from customers through a reconcilable automatic adjustment clause pursuant to section 1307. Energy efficiency and demand-side resource programs shall be deemed to be a new service offered for the

first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(i) Reporting.--The commission shall submit an annual report to the General Assembly describing the results of the programs implemented by each of the electric distribution companies, including, but not limited to:

(1) The costs, benefits and reductions in energy costs.

(2) Energy use by customer class within this Commonwealth.

(3) Reductions in overall peak demand and projections toward complying with the overall target reduction goals of this section.

(j) Definitions.--For purposes of this section, the term "electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

SECTION 4. SECTION 2807(E) OF TITLE 66 IS AMENDED BY ADDING A PARAGRAPH TO READ: <--

§ 2807. DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.

* * *

(E) OBLIGATION TO SERVE.--* * *

(6) (I) WITHIN NINE MONTHS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, ELECTRIC DISTRIBUTION COMPANIES SHALL FILE A SMART METER TECHNOLOGY PROCUREMENT AND INSTALLATION PLAN WITH THE COMMISSION FOR APPROVAL AND MAKE THE PLAN AVAILABLE FOR PUBLIC COMMENT FOR A MINIMUM OF 30 DAYS. THE PLAN SHALL DESCRIBE THE SMART METER TECHNOLOGIES THE ELECTRIC DISTRIBUTION COMPANY PROPOSES TO INSTALL, HOW THE SMART METER TECHNOLOGY MEETS THE

REQUIREMENTS OF THIS PARAGRAPH AND HOW THE SMART METER TECHNOLOGY SHALL BE INSTALLED ACCORDING TO THIS PARAGRAPH. IN ADDITION, THE PLAN SHALL ENSURE THAT ALL SMART METER TECHNOLOGY INSTALLATION AND MAINTENANCE WORK SHALL BE PERFORMED BY ADEQUATELY TRAINED AND QUALIFIED PERSONNEL AND THAT, TO THE EXTENT PRACTICAL, SUCH WORK SHALL BE OFFERED INITIALLY TO EMPLOYEES OF THE ELECTRIC DISTRIBUTION COMPANY.

(II) ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY TO:

(A) CUSTOMERS RESPONSIBLE FOR 40% OF THE DISTRIBUTION COMPANY'S ANNUAL PEAK DEMAND WITHIN FOUR YEARS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH.

(B) CUSTOMERS RESPONSIBLE FOR 75% OF THE DISTRIBUTION COMPANY'S ANNUAL PEAK DEMAND WITHIN SIX YEARS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH.

(C) ONE HUNDRED PERCENT OF ITS CUSTOMERS WITHIN TEN YEARS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH.

ELECTRIC DISTRIBUTION COMPANIES SHALL, WITH CUSTOMER CONSENT, MAKE AVAILABLE ELECTRONIC ACCESS TO CUSTOMER METER DATA TO THIRD PARTIES, INCLUDING ELECTRIC GENERATION SUPPLIERS AND PROVIDERS OF CONSERVATION AND LOAD MANAGEMENT SERVICES.

(III) ELECTRIC DISTRIBUTION COMPANIES SHALL BE PERMITTED TO RECOVER ALL REASONABLE AND PRUDENT COSTS, AS DETERMINED BY THE COMMISSION, OF PROVIDING SMART METER TECHNOLOGY, INCLUDING ANNUAL DEPRECATION AND CAPITAL COSTS OVER THE LIFE OF THE SMART METER TECHNOLOGY, THAT ARE INCURRED AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, LESS ALL OPERATING AND CAPITAL COSTS SAVINGS REALIZED BY

THE ELECTRIC DISTRIBUTION COMPANY FROM THE INTRODUCTION AND USE OF THE SMART METER TECHNOLOGY. AN ELECTRIC DISTRIBUTION COMPANY MAY, AT ITS OPTION, RECOVER SUCH SMART METER TECHNOLOGY COSTS:

(A) THROUGH BASE RATES, INCLUDING A DEFERRAL FOR FUTURE BASE RATE RECOVERY OF CURRENT COSTS, WITH CARRYING CHARGES EQUAL TO 6%; OR

(B) ON A FULL AND CURRENT BASIS THROUGH A RECONCILABLE AUTOMATIC ADJUSTMENT CLAUSE UNDER SECTION 1307 (RELATING TO SLIDING SCALE OF RATES; ADJUSTMENTS).

IN NO EVENT SHALL LOST OR DECREASED REVENUES BY AN ELECTRIC DISTRIBUTION COMPANY DUE TO REDUCED ELECTRICITY CONSUMPTION OR SHIFTING ENERGY DEMAND BE CONSIDERED A COST OF SMART METER TECHNOLOGY. SMART METER TECHNOLOGY SHALL BE DEEMED TO BE A NEW SERVICE OFFERED FOR THE FIRST TIME UNDER SECTION 2804(4)(VI) (RELATING TO STANDARDS FOR RESTRUCTURING OF ELECTRIC INDUSTRY).

(IV) BY JANUARY 1, 2010, OR AT THE END OF THE APPLICABLE GENERATION RATE CAP PERIOD, WHICHEVER IS LATER, A DEFAULT SERVICE PROVIDER SHALL SUBMIT TO THE COMMISSION ONE OR MORE PROPOSED TIME-OF-USE RATES AND A REAL-TIME PRICE PLAN. THE COMMISSION SHALL APPROVE OR MODIFY THE TIME-OF-USE RATES AND REAL-TIME PRICE PLAN WITHIN SIX MONTHS OF SUBMITTAL. THE DEFAULT SERVICE PROVIDER SHALL OFFER COMMISSION-APPROVED TIME-OF-USE RATES AND A REAL-TIME PRICE PLAN TO ALL RESIDENTIAL AND COMMERCIAL CUSTOMERS THAT HAVE BEEN PROVIDED WITH SMART METER TECHNOLOGY WITHIN 60 DAYS OF INSTALLATION OF THE SMART METER TECHNOLOGY OR COMMISSION APPROVAL OF THE

TIME-OF-USE RATES AND A REAL-TIME PRICE PLAN, WHICHEVER IS LATER. CUSTOMER PARTICIPATION IN TIME-OF-USE RATES OR REAL-TIME PRICING SHALL BE VOLUNTARY AND SHALL ONLY BE PROVIDED WITH THE AFFIRMATIVE CONSENT OF THE CUSTOMER. THE DEFAULT SERVICE PROVIDER SHALL SUBMIT AN ANNUAL REPORT TO THE COMMISSION ON THE PARTICIPATION IN THE TIME-OF-USE AND REAL-TIME PRICE PROGRAMS AND THE EFFICACY OF THE PROGRAMS IN AFFECTING ENERGY DEMAND AND CONSUMPTION AND THE EFFECT ON WHOLESALE MARKET PRICES.

(V) FOR PURPOSES OF THIS PARAGRAPH, THE TERM "ELECTRIC DISTRIBUTION COMPANY" SHALL MEAN A PUBLIC UTILITY PROVIDING FACILITIES FOR THE JURISDICTIONAL TRANSMISSION AND DISTRIBUTION OF ELECTRICITY TO 100,000 OR MORE RETAIL CUSTOMERS IN THIS COMMONWEALTH.

Section ~~3~~ 5. This act shall take effect immediately. <--

Appendix J

PRIOR PRINTER'S NOS. 3089, 3176, 3218 PRINTER'S NO. 3233

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE BILL

No. 2200 Session of 2008

INTRODUCED BY GEORGE, McCALL, BELFANTI, CALTAGIRONE, CONKLIN, DALEY, GOODMAN, HARHAI, HARKINS, KULA, MANDERINO, McGEEHAN, VITALI, J. WHITE, WALKO, SURRA, DeLUCA, DERMODY, GRUCELA, JOSEPHS, JAMES, GINGRICH, FREEMAN, K. SMITH, McILVAINE SMITH, YOUNGBLOOD AND FRANKEL, JANUARY 15, 2008

AS AMENDED ON THIRD CONSIDERATION, HOUSE OF REPRESENTATIVES, FEBRUARY 12, 2008

AN ACT

Amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, providing for recovery of certain labor relations expenses; further providing for definitions; providing for adoption of energy efficiency and demand-side response; and further providing for duties of electric distribution companies.

The General Assembly of the Commonwealth of Pennsylvania hereby enacts as follows:

Section 1. Title 66 of the Pennsylvania Consolidated Statutes is amended by adding a section to read:

§ 1329. Recovery of certain labor relations expenses.

No public utility may charge its customers as a permissible operating expense for ratemaking purposes any portion of the direct or indirect cost of meetings, publications, consultants, attorneys or other professional services and expenses associated with the utility's efforts to dissuade the employees of the utility, or the employees of any affiliated interest of the utility as defined in section 2101 (relating to definition of affiliated interest), from becoming or remaining a member in, or otherwise being represented by, any labor union.

Section 2. Section 2803 of Title 66 is amended by adding definitions to read:

§ 2803. Definitions.

The following words and phrases when used in this chapter shall have the meanings given to them in this section unless the context clearly indicates otherwise:

"Affiliated interest." As defined in section 2101 (relating to definition of affiliated interest).

* * *

"Cost effective." In relation to a program being evaluated, satisfaction of the total resource cost test.

* * *

"Demand-side response." Load management technologies, management practices or other strategies employed by retail customers that decrease peak electricity demand or shift demand from on-peak to off-peak periods provided that:

(1) The measure is installed on or after the effective date of this section at the service location of a retail customer.

(2) The measure reduces the peak demand or cost of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

* * *

"Energy efficiency." Technologies, management practices or other strategies or measures employed by retail customers that reduce electricity consumption provided that:

(1) The measure is installed on or after the effective date of this definition at the service location of a retail customer.

(2) The measure reduces the consumption of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

"Independent entity." An entity with no direct or indirect ownership, partnership or other affiliated interest with an electric distribution company.

"Peak demand." The highest electrical requirement occurring during a specified period. For an electric distribution company, the term means the sum of the metered consumption for all retail customers over that period.

"Real-time price." A rate that directly reflects the different cost of energy during each hour.

* * *

"Smart meter technology." Technology, including, but not limited to, metering technology and network communications technology capable of bidirectional communication and that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. The technology shall provide customers with direct access to and use of price and consumption information. The technology shall also:

(1) Directly provide customers with information on their hourly consumption.

(2) Enable time-of-use rates and real-time price programs.

(3) Effectively support the automatic control of the customer's electricity consumption by one or more of the following as selected by the customer:

(i) the customer;

(ii) the customer's utility; or

(iii) a third party engaged by the customer or the customer's utility.

"Time-of-use rate." A rate that reflects the costs of serving customers during different time periods, including off-peak and on-peak periods, but not as frequently as each hour.

"Total resources cost test." A standard test that is met if, over the effective life of the program, the avoided supply-side monetary costs are greater than the monetary costs of the demand-side programs borne by both the electric distribution company and the participants.

* * *

Section 3. Title 66 is amended by adding a section to read:

§ 2806.1. Adoption of procedures encouraging energy efficiency and demand-side response.

(a) Program.--The commission shall develop a program to provide for the implementation of cost-effective programs that reduce energy demand and consumption within the service territories of all electric distribution companies throughout this Commonwealth. The program shall include, but is not limited to, the following:

(1) Selecting a program administrator to develop and oversee the delivery of energy efficiency and demand-side response programs within the service territory of each electric distribution company within this Commonwealth.

(2) Implementing the necessary administrative and

financial mechanisms that will enable the program administrator to develop and oversee the provision of energy efficiency and demand-side response programs within the service territory of each electric distribution company within this Commonwealth, including the levying of assessments in accordance with sections 510 (relating to assessment for regulatory expenses upon public utilities), 1307 (relating to sliding scale of rates; adjustments) and 1308 (relating to voluntary changes in rates). The commission shall not approve or implement and shall not assess or charge to customers the costs of energy efficiency or demand-response programs to the extent that the costs of such programs exceed 2% of the total annual revenues of the electric distribution company from all sources, including default service generation revenues as of January 1, 2007. This funding limit shall not include amounts provided for by the low-income usage reduction programs established under regulations at 52 Pa. Code Ch. 58 (relating to residential low income usage reduction programs).

(3) Implementing the necessary administrative and financial mechanisms that facilitate a system of third-party entities to deliver all or portions of the energy efficiency and demand-side response programs within the service territory of each electric distribution company within this Commonwealth, including the levying of assessments in accordance with sections 510, 1307 and 1308. The commission may order the electric distribution company to pay the third-party entity for services rendered in an electric distribution company's respective service territory pursuant to this section. The electric distribution company may be a

third-party entity.

(b) Selection of program administrator.--The commission shall implement the following procedures when selecting a program administrator:

(1) The commission shall prepare a request for proposals for a program administrator to provide for the development and delivery of the energy efficiency and demand-side response programs in the service territories of all electric distribution companies and shall make the request for proposals available for public comment.

(2) The commission shall, within 60 days of the completion of the public comment period, issue the final request for proposals.

(3) The commission shall, based on a competitive bid process, select an independent entity to serve as the energy efficiency and demand-side response program administrator.

(4) The commission shall include as a part of its agreement with the program administrator a system of performance parameters and a financial mechanism that provides incentives for exceeding established performance parameters and penalties for third parties not meeting established performance parameters.

(c) Powers and duties of program administrator.--The program administrator shall have powers and duties assigned by the commission. The powers and duties shall include, but not be limited to:

(1) Soliciting through a competitive procurement process within each electric distribution company service territory a program of providing energy efficiency and demand-side response programs to residential, commercial and industrial

customers utilizing third-party entities.

(2) Ensuring that each proposal includes, but is not limited to:

(i) A clear delineation of how the program will be conducted.

(ii) The types of specific program measures to be offered.

(iii) The cost and benefit of each program to be

offered.

(iv) A process for monitoring and verifying results, data collection and management procedures, program evaluation processes and financial management strategies.

(3) In its review of each proposal received:

(i) Taking into account the unique circumstances of each electric distribution company's service territory.

(ii) Finding that each program is cost effective and that the portfolio of programs is designed to provide every affected customer class with the opportunity to participate and benefit economically.

(iii) Determining the cost-effectiveness of energy efficiency and demand-side response measures using the total resource cost test.

(4) Recommending to the commission those entities best suited to provide energy efficiency and demand-side response programs within the service territory of each electric distribution company.

(5) In the event no qualified proposals are received that meet the required plan goals in an electric distribution company service territory to conduct the program activities:

(i) Issuing a subsequent request for proposals with

plan goals that are reduced no more than necessary to obtain qualified proposals to provide program activities. The lowered plan goals for energy efficiency and demand-side response shall only be in effect for that year.

(ii) In subsequent years, utilizing the plan goals unless no qualified proposals are received to conduct the program activities that meet the plan goals, the program administrator shall issue a subsequent request for proposals in accordance with the procedures identified in this subparagraph.

(6) Executing agreements on behalf of the commission with the selected entity in each electric distribution company service territory to conduct the energy efficiency and demand-side response program. As part of these agreements the program administrator shall ensure that:

(i) The programs offered by the selected entity are provided equitably across all customer classes.

(ii) A clearly defined process for financial compensation for the entity delivering the program which is tied to defined goals for performance regarding program activities accomplished, energy cost savings on a per-customer basis and utility-wide basis and overall energy and peak demand reduction is established.

(iii) A system of incentives and penalties for performance of contractual activities above and below predetermined levels is in place.

(iv) There is a set contract term which may include an initial three-year term with renewal terms of varied length.

(7) Submitting reports to the commission at such times

and in such manner as the commission directs.

(d) Commission review of recommendations.--The commission shall review the recommendations made by the program administrator regarding those entities best suited to provide energy efficiency and demand-side response programs within the service territory of each electric distribution company. The commission shall approve or disapprove the recommendations made by the program administrator.

(1) The commission review of the recommendations of the program administrator shall be limited to ensuring that:

(i) There is no evidence of fraud or market abuse.

(ii) Any costs entered into are borne by the appropriate parties and that costs, including the costs of subsection ~~(c)(6)(iv)~~ (C)(6)(III) incentives, related <-- to the provision of the contracted services are borne by the appropriate customer class.

(iii) There will be provided, in a cost-effective manner, a program that provides energy efficiency and demand-side response measures to all customer classes throughout the service territory of each electric distribution company.

(2) If the commission approves a third-party entity to conduct the program, the commission shall ensure the program administrator finalizes the agreement between the commission and the third-party entity selected to provide the program of energy efficiency and demand-side response.

(3) In the event the commission disapproves the recommendation of the program administrator, the commission shall provide a rationale for this decision and direct the program administrator on a course of action.

(e) Plan goals.--The program administrator shall ensure that each proposal submitted by a third-party entity to deliver a program of energy efficiency and demand-side response measures includes meeting the following energy saving goals:

(1) The following relate to energy efficiency goals:

(i) By May 31, 2011, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 1%. This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2010, through May 31, 2011, based on load for the period June 1, 2007, through May 31, 2008, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve. The commission shall determine and make public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third-party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company.

(ii) By May 31, 2013, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 2.5%. This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2012, through May 31, 2013, based on load for the period June 1, 2007, through May 31, 2008, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve. The commission shall determine and make

public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third-party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company.

(iii) By November 30, 2013, the program administrator shall evaluate the costs and benefits of these energy efficiency and conservation programs. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the program administrator, in consultation with the commission, shall set additional, incremental energy efficiency and conservation goals for the period ending May 31, 2018.

(iv) After May 31, 2018, the program administrator shall continue to evaluate the costs and benefits of efficiency and conservation measures and, in consultation with the commission, may adopt additional incremental load reduction standards for electric distribution companies.

(2) The following relate to demand-side response measures:

(i) Cost-effective demand-side response measures to

reduce peak demand by a minimum of 4% in the 100 hours of highest demand with provision made for weather adjustments and extraordinary load that the electric distribution company must serve shall be implemented in each electric distribution company's service territory. This reduction will be measured against the electric

distribution company's peak demand in the 100 hours of greatest demand for June 1, 2007, through May 31, 2008. The reductions shall be accomplished by May 31, 2012.

(ii) By November 30, 2012, the program administrator shall compare the total costs of these demand-side response measures to the total savings in energy and capacity costs to retail customers of this Commonwealth. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the commission shall order additional peak demand reductions for the 100 hours of greatest demand or an alternative measure adopted by the commission. The reductions shall be measured from the electric distribution company's peak demand for the period from June 1, 2011, through May 31, 2012. The mandated reductions shall be accomplished no later than May 31, 2017.

(iii) After May 31, 2017, the program administrator shall continue to evaluate the costs and benefits of demand-side response measures and may, in consultation with the commission, adopt additional incremental peak load reduction standards.

(f) Measurements and verification.--The commission shall establish standards by which the program administrator submits to the commission an annual report, which includes that information relating to the actions and results of the energy efficiency and demand-side response programs undertaken within each electric distribution service territory by each third-party entity.

(1) The report shall include, but not be limited to:

(i) Documentation of program expenditures.

(ii) Measurement and verification of savings resulting from programs.

(iii) Evaluation of the cost-effectiveness of expenditures.

(iv) Any other information the commission may require pursuant to its rulemaking authority.

(2) The program administrator, upon consultation with the commission, shall direct a third-party entity to modify or terminate a particular energy efficiency or a demand-side response program if, after an adequate period for implementation of the program, the commission determines the program is not sufficiently meeting its goals and purposes.

(3) In the event an energy efficiency or demand-side response program is terminated, the program administrator shall require the third-party entity to submit a revised program describing the actions to be undertaken to either offer a substitute program or increase the availability of existing programs to make up for the effect of the terminated program on its overall program goals.

(g) Responsibilities of electric distribution companies.--Each electric distribution company that does not seek to be a third-party entity shall:

(1) Cooperate with the program administrator as needed in its efforts to competitively procure the services of a third-party entity to provide an energy efficiency and demand-side response program within the service territory of the electric distribution company.

(2) Provide information necessary to effectively facilitate the work of the selected third-party entity in conducting the energy efficiency and demand-side response

program.

(3) Provide assistance as may be requested by the program administrator in reviewing proposals from third-party entities seeking to provide energy efficiency and demand-side response programs within their service territories.

(4) Provide assistance as may be requested by the program administrator to facilitate the successful execution of the contract agreement with the third-party entities to provide an energy efficiency and demand-side response program within their service territories.

(h) Recovery of administrative and program costs.--An electric distribution company may fully recover all administrative costs, including, but not limited to, costs incurred under subsections (a)(3) and (g)(1), (2), (3) and (4), that the commission determines are prudently incurred and reasonable in amount pursuant to implementing a program to deliver cost-effective energy efficiency and demand-side response activities through a third-party entity. Program and administrative costs shall be recovered on a full and current basis by the electric distribution company from customers through a reconcilable automatic adjustment clause pursuant to section 1307. Energy efficiency and demand-side resource programs shall be deemed to be a new service offered for the first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(i) Reporting.--The commission shall submit an annual report to the General Assembly describing the results of the programs implemented by each of the electric distribution companies, including, but not limited to:

(1) The costs, benefits and reductions in energy costs.

(2) Energy use by customer class within this Commonwealth.

(3) Reductions in overall peak demand and projections toward complying with the overall target reduction goals of this section.

(j) Definitions.--For purposes of this section, the term "electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

Section 4. Section 2807(e) of Title 66 is amended by adding a paragraph to read:

§ 2807. Duties of electric distribution companies.

* * *

(e) Obligation to serve.--* * *

(6) (i) Within nine months after the effective date of this paragraph, electric distribution companies shall file a smart meter technology procurement and installation plan with the commission for approval and make the plan available for public comment for a minimum of 30 days. The plan shall describe the smart meter technologies the electric distribution company proposes to install, how the smart meter technology meets the requirements of this paragraph and how the smart meter technology shall be installed according to this paragraph. In addition, the plan shall ensure that all smart meter technology installation and maintenance work shall be performed by adequately trained and qualified personnel and that, to the extent practical, such work shall be offered initially to employees of the electric

distribution company.

(ii) Electric distribution companies shall furnish smart meter technology to:

(A) Customers responsible for 40% of the distribution company's annual peak demand within four years after the effective date of this paragraph.

(B) Customers responsible for 75% of the distribution company's annual peak demand within six

years after the effective date of this paragraph.

(C) One hundred percent of its customers within ten years after the effective date of this paragraph.

Electric distribution companies shall, with customer consent, make available electronic access to customer meter data to third parties, including electric generation suppliers and providers of conservation and load management services.

(iii) Electric distribution companies shall be permitted to recover all reasonable and prudent costs, as determined by the commission, of providing smart meter technology, including annual deprecation and capital costs over the life of the smart meter technology, that are incurred after the effective date of this paragraph, less all operating and capital costs savings realized by the electric distribution company from the introduction and use of the smart meter technology. An electric distribution company may, at its option, recover such smart meter technology costs:

(A) through base rates, including a deferral for future base rate recovery of current costs, with carrying charges equal to 6%; or

(B) on a full and current basis through a reconcilable automatic adjustment clause under section 1307 (relating to sliding scale of rates; adjustments).

In no event shall lost or decreased revenues by an electric distribution company due to reduced electricity consumption or shifting energy demand be considered a cost of smart meter technology. Smart meter technology shall be deemed to be a new service offered for the first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(iv) By January 1, 2010, or at the end of the applicable generation rate cap period, whichever is later, a default service provider shall submit to the commission one or more proposed time-of-use rates and a real-time price plan. The commission shall approve or modify the time-of-use rates and real-time price plan within six months of submittal. The default service provider shall offer commission-approved time-of-use rates and a real-time price plan to all residential and commercial customers that have been provided with smart meter technology within 60 days of installation of the smart meter technology or commission approval of the time-of-use rates and a real-time price plan, whichever is later. Customer participation in time-of-use rates or real-time pricing shall be voluntary and shall only be provided with the affirmative consent of the customer. The default service provider shall submit an annual report to the commission on the participation in the time-of-use and real-time price programs and the efficacy

of the programs in affecting energy demand and consumption and the effect on wholesale market prices.

(v) For purposes of this paragraph, the term "electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

Section 5. This act shall take effect immediately.

Appendix K

SENATE AMENDED

PRIOR PRINTER'S NOS. 3089, 3176, 3218, 3233 PRINTER'S NO. 4429

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE BILL

No. 2200 Session of 2008

INTRODUCED BY GEORGE, McCALL, BELFANTI, CALTAGIRONE, CONKLIN, DALEY, GOODMAN, HARHAI, HARKINS, KULA, MANDERINO, McGEEHAN, VITALI, J. WHITE, WALKO, SURRA, DeLUCA, DERMODY, GRUCELA, JOSEPHS, JAMES, GINGRICH, FREEMAN, K. SMITH, McILVAINE SMITH, YOUNGBLOOD AND FRANKEL, JANUARY 15, 2008

SENATOR TOMLINSON, CONSUMER PROTECTION AND PROFESSIONAL LICENSURE, IN SENATE, AS AMENDED, SEPTEMBER 23, 2008

AN ACT

Amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, ~~providing for recovery of certain labor relations expenses; further providing for definitions; providing for adoption of energy efficiency and demand side response; and further providing for duties of electric distribution companies.~~ FURTHER PROVIDING FOR DEFINITIONS; PROVIDING FOR ENERGY EFFICIENCY AND CONSERVATION; FURTHER PROVIDING FOR DUTIES OF ELECTRIC DISTRIBUTION COMPANIES; AND PROVIDING FOR PROCUREMENT. <--

The General Assembly of the Commonwealth of Pennsylvania hereby enacts as follows:

~~Section 1. Title 66 of the Pennsylvania Consolidated Statutes is amended by adding a section to read:~~ <--

~~§ 1329. Recovery of certain labor relations expenses.~~

~~No public utility may charge its customers as a permissible operating expense for ratemaking purposes any portion of the direct or indirect cost of meetings, publications, consultants, attorneys or other professional services and expenses associated with the utility's efforts to dissuade the employees of the utility, or the employees of any affiliated interest of the utility as defined in section 2101 (relating to definition of affiliated interest), from becoming or remaining a member in, or otherwise being represented by, any labor union.~~

~~Section 2. Section 2803 of Title 66 is amended by adding definitions to read:~~

~~§ 2803. Definitions.~~

~~The following words and phrases when used in this chapter shall have the meanings given to them in this section unless the context clearly indicates otherwise:~~

~~"Affiliated interest." As defined in section 2101 (relating to definition of affiliated interest).~~

~~* * *~~

~~"Cost effective." In relation to a program being evaluated, satisfaction of the total resource cost test.~~

~~* * *~~

~~"Demand-side response." Load management technologies, management practices or other strategies employed by retail customers that decrease peak electricity demand or shift demand~~

from on-peak to off-peak periods provided that:

(1) The measure is installed on or after the effective date of this section at the service location of a retail customer.

(2) The measure reduces the peak demand or cost of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

* * *

"Energy efficiency." Technologies, management practices or other strategies or measures employed by retail customers that reduce electricity consumption provided that:

(1) The measure is installed on or after the effective date of this definition at the service location of a retail customer.

(2) The measure reduces the consumption of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

"Independent entity." An entity with no direct or indirect ownership, partnership or other affiliated interest with an electric distribution company.

"Peak demand." The highest electrical requirement occurring during a specified period. For an electric distribution company, the term means the sum of the metered consumption for all retail customers over that period.

"Real time price." A rate that directly reflects the different cost of energy during each hour.

* * *

"Smart meter technology." Technology, including, but not limited to, metering technology and network communications technology capable of bidirectional communication and that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. The technology shall provide customers with direct access to and use of price and consumption information. The technology shall also:

(1) Directly provide customers with information on their

hourly consumption.

(2) Enable time-of-use rates and real-time price programs.

(3) Effectively support the automatic control of the customer's electricity consumption by one or more of the following as selected by the customer:

(i) the customer;

(ii) the customer's utility; or

(iii) a third party engaged by the customer or the customer's utility.

"Time of use rate." A rate that reflects the costs of serving customers during different time periods, including off-peak and on peak periods, but not as frequently as each hour.

"Total resources cost test." A standard test that is met if, over the effective life of the program, the avoided supply side monetary costs are greater than the monetary costs of the demand side programs borne by both the electric distribution company and the participants.

* * *

Section 3. Title 66 is amended by adding a section to read:

§ 2806.1. Adoption of procedures encouraging energy efficiency and demand side response.

(a) Program. The commission shall develop a program to provide for the implementation of cost-effective programs that reduce energy demand and consumption within the service territories of all electric distribution companies throughout this Commonwealth. The program shall include, but is not limited to, the following:

(1) Selecting a program administrator to develop and oversee the delivery of energy efficiency and demand side

response programs within the service territory of each electric distribution company within this Commonwealth.

(2) Implementing the necessary administrative and financial mechanisms that will enable the program administrator to develop and oversee the provision of energy efficiency and demand side response programs within the service territory of each electric distribution company within this Commonwealth, including the levying of assessments in accordance with sections 510 (relating to assessment for regulatory expenses upon public utilities), 1307 (relating to sliding scale of rates; adjustments) and 1308 (relating to voluntary changes in rates). The commission shall not approve or implement and shall not assess or charge to customers the costs of energy efficiency or demand response programs to the extent that the costs of such programs exceed 2% of the total annual revenues of the electric distribution company from all sources, including default service generation revenues as of January 1, 2007. This funding limit shall not include amounts provided for by the low-income usage reduction programs established under regulations at 52 Pa. Code Ch. 58 (relating to residential low income usage reduction programs).

(3) Implementing the necessary administrative and financial mechanisms that facilitate a system of third party entities to deliver all or portions of the energy efficiency and demand side response programs within the service territory of each electric distribution company within this Commonwealth, including the levying of assessments in accordance with sections 510, 1307 and 1308. The commission may order the electric distribution company to pay the third-

party entity for services rendered in an electric distribution company's respective service territory pursuant to this section. The electric distribution company may be a third party entity.

(b) Selection of program administrator. The commission shall implement the following procedures when selecting a program administrator:

(1) The commission shall prepare a request for proposals for a program administrator to provide for the development and delivery of the energy efficiency and demand side response programs in the service territories of all electric distribution companies and shall make the request for proposals available for public comment.

(2) The commission shall, within 60 days of the completion of the public comment period, issue the final request for proposals.

(3) The commission shall, based on a competitive bid process, select an independent entity to serve as the energy efficiency and demand side response program administrator.

(4) The commission shall include as a part of its agreement with the program administrator a system of performance parameters and a financial mechanism that provides incentives for exceeding established performance parameters and penalties for third parties not meeting established performance parameters.

(c) Powers and duties of program administrator. The program administrator shall have powers and duties assigned by the commission. The powers and duties shall include, but not be limited to:

(1) Soliciting through a competitive procurement process

within each electric distribution company service territory a program of providing energy efficiency and demand side response programs to residential, commercial and industrial customers utilizing third party entities.

(2) Ensuring that each proposal includes, but is not

limited to:

(i) A clear delineation of how the program will be conducted.

(ii) The types of specific program measures to be offered.

(iii) The cost and benefit of each program to be offered.

(iv) A process for monitoring and verifying results, data collection and management procedures, program evaluation processes and financial management strategies.

(3) In its review of each proposal received:

(i) Taking into account the unique circumstances of each electric distribution company's service territory.

(ii) Finding that each program is cost effective and that the portfolio of programs is designed to provide every affected customer class with the opportunity to participate and benefit economically.

(iii) Determining the cost effectiveness of energy efficiency and demand side response measures using the total resource cost test.

(4) Recommending to the commission those entities best suited to provide energy efficiency and demand side response programs within the service territory of each electric distribution company.

(5) In the event no qualified proposals are received

that meet the required plan goals in an electric distribution company service territory to conduct the program activities:

(i) Issuing a subsequent request for proposals with plan goals that are reduced no more than necessary to obtain qualified proposals to provide program activities. The lowered plan goals for energy efficiency and demand side response shall only be in effect for that year.

(ii) In subsequent years, utilizing the plan goals unless no qualified proposals are received to conduct the program activities that meet the plan goals, the program administrator shall issue a subsequent request for proposals in accordance with the procedures identified in this subparagraph.

(6) Executing agreements on behalf of the commission with the selected entity in each electric distribution company service territory to conduct the energy efficiency and demand side response program. As part of these agreements the program administrator shall ensure that:

(i) The programs offered by the selected entity are provided equitably across all customer classes.

(ii) A clearly defined process for financial compensation for the entity delivering the program which is tied to defined goals for performance regarding program activities accomplished, energy cost savings on a per customer basis and utility wide basis and overall energy and peak demand reduction is established.

(iii) A system of incentives and penalties for performance of contractual activities above and below predetermined levels is in place.

(iv) There is a set contract term which may include

an initial three year term with renewal terms of varied length.

(7) Submitting reports to the commission at such times and in such manner as the commission directs.

(d) Commission review of recommendations. The commission shall review the recommendations made by the program administrator regarding those entities best suited to provide energy efficiency and demand side response programs within the service territory of each electric distribution company. The commission shall approve or disapprove the recommendations made by the program administrator.

(1) The commission review of the recommendations of the program administrator shall be limited to ensuring that:

(i) There is no evidence of fraud or market abuse.

(ii) Any costs entered into are borne by the appropriate parties and that costs, including the costs of subsection (c)(6)(iii) incentives, related to the provision of the contracted services are borne by the appropriate customer class.

(iii) There will be provided, in a cost effective manner, a program that provides energy efficiency and demand side response measures to all customer classes throughout the service territory of each electric distribution company.

(2) If the commission approves a third party entity to conduct the program, the commission shall ensure the program administrator finalizes the agreement between the commission and the third party entity selected to provide the program of energy efficiency and demand side response.

(3) In the event the commission disapproves the

recommendation of the program administrator, the commission shall provide a rationale for this decision and direct the program administrator on a course of action.

(e) Plan goals.--The program administrator shall ensure that each proposal submitted by a third-party entity to deliver a program of energy efficiency and demand side response measures includes meeting the following energy saving goals:

(1) The following relate to energy efficiency goals:

(i) By May 31, 2011, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 1%. This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2010, through May 31, 2011, based on load for the period June 1, 2007, through May 31, 2008, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve. The commission shall determine and make public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company.

(ii) By May 31, 2013, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 2.5%. This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2012, through May 31, 2013, based on load for the period June 1, 2007, through May

31, 2008, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve. The commission shall determine and make public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company.

(iii) By November 30, 2013, the program administrator shall evaluate the costs and benefits of these energy efficiency and conservation programs. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the program administrator, in consultation with the commission, shall set additional, incremental energy efficiency and conservation goals for the period ending May 31, 2018.

(iv) After May 31, 2018, the program administrator shall continue to evaluate the costs and benefits of efficiency and conservation measures and, in consultation

with the commission, may adopt additional incremental load reduction standards for electric distribution companies.

(2) The following relate to demand side response measures:

(i) Cost effective demand side response measures to reduce peak demand by a minimum of 4% in the 100 hours of highest demand with provision made for weather adjustments and extraordinary load that the electric

distribution company must serve shall be implemented in each electric distribution company's service territory. This reduction will be measured against the electric distribution company's peak demand in the 100 hours of greatest demand for June 1, 2007, through May 31, 2008. The reductions shall be accomplished by May 31, 2012.

(ii) By November 30, 2012, the program administrator shall compare the total costs of these demand side response measures to the total savings in energy and capacity costs to retail customers of this Commonwealth. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the commission shall order additional peak demand reductions for the 100 hours of greatest demand or an alternative measure adopted by the commission. The reductions shall be measured from the electric distribution company's peak demand for the period from June 1, 2011, through May 31, 2012. The mandated reductions shall be accomplished no later than May 31, 2017.

(iii) After May 31, 2017, the program administrator shall continue to evaluate the costs and benefits of demand side response measures and may, in consultation with the commission, adopt additional incremental peak load reduction standards.

(f) Measurements and verification. The commission shall establish standards by which the program administrator submits to the commission an annual report, which includes that information relating to the actions and results of the energy efficiency and demand side response programs undertaken within each electric distribution service territory by each third party

entity.

(1) The report shall include, but not be limited to:

(i) Documentation of program expenditures.

(ii) Measurement and verification of savings resulting from programs.

(iii) Evaluation of the cost-effectiveness of expenditures.

(iv) Any other information the commission may require pursuant to its rulemaking authority.

(2) The program administrator, upon consultation with the commission, shall direct a third party entity to modify or terminate a particular energy efficiency or a demand side response program if, after an adequate period for implementation of the program, the commission determines the program is not sufficiently meeting its goals and purposes.

(3) In the event an energy efficiency or demand side response program is terminated, the program administrator shall require the third party entity to submit a revised program describing the actions to be undertaken to either offer a substitute program or increase the availability of existing programs to make up for the effect of the terminated program on its overall program goals.

(g) Responsibilities of electric distribution companies. Each electric distribution company that does not seek to be a third party entity shall:

(1) Cooperate with the program administrator as needed in its efforts to competitively procure the services of a third party entity to provide an energy efficiency and demand side response program within the service territory of

the electric distribution company.

(2) Provide information necessary to effectively facilitate the work of the selected third party entity in conducting the energy efficiency and demand side response program.

(3) Provide assistance as may be requested by the program administrator in reviewing proposals from third party entities seeking to provide energy efficiency and demand side response programs within their service territories.

(4) Provide assistance as may be requested by the program administrator to facilitate the successful execution of the contract agreement with the third party entities to provide an energy efficiency and demand side response program within their service territories.

(h) Recovery of administrative and program costs. An electric distribution company may fully recover all administrative costs, including, but not limited to, costs incurred under subsections (a)(3) and (g)(1), (2), (3) and (4), that the commission determines are prudently incurred and reasonable in amount pursuant to implementing a program to deliver cost-effective energy efficiency and demand-side response activities through a third-party entity. Program and administrative costs shall be recovered on a full and current basis by the electric distribution company from customers through a reconcilable automatic adjustment clause pursuant to section 1307. Energy efficiency and demand side resource programs shall be deemed to be a new service offered for the first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(i) Reporting. The commission shall submit an annual report to the General Assembly describing the results of the programs

implemented by each of the electric distribution companies, including, but not limited to:

(1) The costs, benefits and reductions in energy costs.

(2) Energy use by customer class within this Commonwealth.

(3) Reductions in overall peak demand and projections toward complying with the overall target reduction goals of this section.

(j) Definitions.--For purposes of this section, the term "electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

Section 4. Section 2807(e) of Title 66 is amended by adding a paragraph to read:

§ 2807. Duties of electric distribution companies.

* * *

(e) Obligation to serve.--* * *

(6) (i) Within nine months after the effective date of this paragraph, electric distribution companies shall file a smart meter technology procurement and installation plan with the commission for approval and make the plan available for public comment for a minimum of 30 days. The plan shall describe the smart meter technologies the electric distribution company proposes to install, how the smart meter technology meets the requirements of this paragraph and how the smart meter technology shall be installed according to this paragraph. In addition, the plan shall ensure that all smart meter technology installation and maintenance work

shall be performed by adequately trained and qualified personnel and that, to the extent practical, such work shall be offered initially to employees of the electric distribution company.

(ii) Electric distribution companies shall furnish smart meter technology to:

(A) Customers responsible for 40% of the distribution company's annual peak demand within four years after the effective date of this paragraph.

(B) Customers responsible for 75% of the distribution company's annual peak demand within six years after the effective date of this paragraph.

(C) One hundred percent of its customers within ten years after the effective date of this paragraph.

Electric distribution companies shall, with customer consent, make available electronic access to customer meter data to third parties, including electric generation suppliers and providers of conservation and load management services.

(iii) Electric distribution companies shall be permitted to recover all reasonable and prudent costs, as determined by the commission, of providing smart meter technology, including annual deprecation and capital costs over the life of the smart meter technology, that are incurred after the effective date of this paragraph, less all operating and capital costs savings realized by the electric distribution company from the introduction and use of the smart meter technology. An electric distribution company may, at its option, recover such smart meter technology costs:

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(A) through base rates, including a deferral for future base rate recovery of current costs, with carrying charges equal to 6%; or

(B) on a full and current basis through a reconcilable automatic adjustment clause under section 1307 (relating to sliding scale of rates; adjustments).

In no event shall lost or decreased revenues by an electric distribution company due to reduced electricity consumption or shifting energy demand be considered a cost of smart meter technology. Smart meter technology shall be deemed to be a new service offered for the first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(iv) By January 1, 2010, or at the end of the applicable generation rate cap period, whichever is later, a default service provider shall submit to the commission one or more proposed time of use rates and a real time price plan. The commission shall approve or modify the time of use rates and real time price plan within six months of submittal. The default service provider shall offer commission approved time of use rates and a real time price plan to all residential and commercial customers that have been provided with smart meter technology within 60 days of installation of the smart meter technology or commission approval of the time of use rates and a real time price plan, whichever is later. Customer participation in time of use rates or real time pricing shall be voluntary and shall only be provided with the affirmative consent of the customer.

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The default service provider shall submit an annual report to the commission on the participation in the time of use and real time price programs and the efficacy of the programs in affecting energy demand and consumption and the effect on wholesale market prices.

(v) For purposes of this paragraph, the term "electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

Section 5. This act shall take effect immediately.

SECTION 1. SECTION 2803 OF TITLE 66 OF THE PENNSYLVANIA CONSOLIDATED STATUTES IS AMENDED BY ADDING DEFINITIONS TO READ: <--

§ 2803. DEFINITIONS.

THE FOLLOWING WORDS AND PHRASES WHEN USED IN THIS CHAPTER SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SECTION UNLESS THE CONTEXT CLEARLY INDICATES OTHERWISE:

* * *

"BILATERAL CONTRACT." AN AGREEMENT, AS APPROVED BY THE PENNSYLVANIA PUBLIC UTILITY COMMISSION, REACHED BY TWO PARTIES, EACH ACTING IN ITS OWN INDEPENDENT SELF-INTEREST, AS A RESULT OF NEGOTIATIONS FREE OF UNDUE INFLUENCE, DURESS OR FAVORITISM, IN WHICH THE ELECTRIC ENERGY SUPPLIER AGREES TO SELL AND THE ELECTRIC DISTRIBUTION COMPANY AGREES TO BUY A QUANTITY OF ELECTRIC ENERGY AT A SPECIFIED PRICE FOR A SPECIFIED PERIOD OF TIME UNDER TERMS AGREED TO BY BOTH PARTIES, AND WHICH FOLLOWS A STANDARD INDUSTRY TEMPLATE WIDELY ACCEPTED IN THE INDUSTRY OR VARIATIONS THERETO ACCEPTED BY THE PARTIES. STANDARD INDUSTRY TEMPLATES MAY INCLUDE THE EEI MASTER AGREEMENT FOR PHYSICAL ENERGY PURCHASES AND SALES AND THE ISDA MASTER AGREEMENT FOR

FINANCIAL ENERGY PURCHASES AND SALES.

* * *

"DEFAULT SERVICE PROVIDER." AN ELECTRIC DISTRIBUTION COMPANY WITHIN ITS CERTIFIED SERVICE TERRITORY OR AN ALTERNATIVE SUPPLIER APPROVED BY THE PENNSYLVANIA PUBLIC UTILITY COMMISSION THAT PROVIDES GENERATION SERVICE TO RETAIL ELECTRIC CUSTOMERS WHO:

(1) CONTRACT FOR ELECTRIC POWER, INCLUDING ENERGY AND CAPACITY, AND THE CHOSEN ELECTRIC GENERATION SUPPLIER DOES NOT SUPPLY THE SERVICE; OR

(2) DO NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER.

SECTION 2. TITLE 66 IS AMENDED BY ADDING A SECTION TO READ:

§ 2806.1. ENERGY EFFICIENCY AND CONSERVATION.

(A) PROGRAM.--THE COMMISSION SHALL ADOPT A PROGRAM TO REQUIRE ELECTRIC DISTRIBUTION COMPANIES TO ADOPT AND IMPLEMENT COST-EFFECTIVE ENERGY EFFICIENCY AND CONSERVATION PLANS TO REDUCE ENERGY DEMAND AND CONSUMPTION WITHIN THE SERVICE TERRITORIES OF ALL ELECTRIC DISTRIBUTION COMPANIES IN THIS COMMONWEALTH. THE PROGRAM SHALL INCLUDE:

(1) PROCEDURES FOR THE APPROVAL OF PLANS SUBMITTED UNDER SUBSECTION (B).

(2) A PLAN EVALUATION PROCESS INCLUDING A PROCESS TO MONITOR AND VERIFY DATA COLLECTION, QUALITY ASSURANCE AND RESULTS SUBMITTED.

(3) AN ANALYSIS OF THE COST AND BENEFIT OF EACH PLAN SUBMITTED UNDER SUBSECTION (B) IN ACCORDANCE WITH A TOTAL RESOURCE COST TEST.

(4) AN ANALYSIS OF HOW THE PROGRAM AND INDIVIDUAL PLANS WILL ENABLE EACH ELECTRIC DISTRIBUTION COMPANY TO ACHIEVE THE

REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(5) STANDARDS TO ENSURE THAT EACH PLAN INCLUDES A VARIETY OF ENERGY EFFICIENCY AND CONSERVATION MEASURES AND WILL PROVIDE THE MEASURES EQUITABLY TO ALL CLASSES OF CUSTOMERS.

(6) PROCEDURES TO REVIEW ALL PROPOSED CONTRACTS PRIOR TO THE EXECUTION OF THE CONTRACT WITH THIRD-PARTY ENTITIES TO IMPLEMENT THE PLAN. THE COMMISSION MAY ORDER THE MODIFICATION OF A PROPOSED CONTRACT TO ENSURE THAT THE PLAN IS ADEQUATE.

(7) PROCEDURES TO ENSURE COMPLIANCE WITH REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(8) A REQUIREMENT FOR THE PARTICIPATION OF THIRD-PARTY ENTITIES IN THE IMPLEMENTATION OF ALL OR PART OF A PLAN.

(9) A PROCESS TO LINK REDUCTIONS IN CONSUMPTION TO THE COMPENSATION OF THIRD-PARTY ENTITIES.

(10) PROCEDURES FOR THE LEVY OF ASSESSMENTS IN ACCORDANCE WITH SECTIONS 510 (RELATING TO ASSESSMENT FOR REGULATORY EXPENSES UPON PUBLIC UTILITIES) AND 1308 (RELATING TO VOLUNTARY CHANGES IN RATES) SUBJECT TO THE LIMITATIONS OF SUBSECTION (G) TO FUND PLANS FILED UNDER SUBSECTION (B) SUBJECT TO THE LIMITATIONS SET FORTH UNDER SUBSECTION (G).

(B) DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.--

(1) (I) BY NOVEMBER 15, 2008, EACH ELECTRIC DISTRIBUTION COMPANY SHALL DEVELOP AND FILE AN ENERGY EFFICIENCY AND CONSERVATION PLAN WITH THE COMMISSION FOR APPROVAL TO MEET THE REQUIREMENTS OF SUBSECTION (A) AND THE REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D). THE PLAN SHALL BE IMPLEMENTED UPON APPROVAL BY THE COMMISSION AND SHALL COMPLY WITH ALL

OF THE FOLLOWING:

(A) INCLUDE SPECIFIC PROPOSALS TO IMPLEMENT ENERGY EFFICIENCY AND CONSERVATION MEASURES TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(B) A MINIMUM OF 10% OF THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D) SHALL BE OBTAINED FROM UNITS OF FEDERAL, STATE AND LOCAL GOVERNMENT, INCLUDING MUNICIPALITIES, SCHOOL DISTRICTS, INSTITUTIONS OF HIGHER EDUCATION AND NONPROFIT ENTITIES.

(C) THE MANNER IN WHICH PERFORMANCE WILL BE MEASURED, VERIFIED AND EVALUATED.

(D) THE MANNER IN WHICH THE PLAN WILL ACHIEVE THE REQUIREMENTS OF THE PROGRAM UNDER SUBSECTION (A) AND THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(E) INCLUDE A CONTRACT WITH ONE OR MORE THIRD-PARTY ENTITIES TO IMPLEMENT THE PLAN OR A PORTION OF THE PLAN AS APPROVED BY THE COMMISSION.

(F) INCLUDE ESTIMATES OF THE COST OF IMPLEMENTATION OF THE ENERGY EFFICIENCY AND CONSERVATION MEASURES IN THE PLAN.

(G) INCLUDE SPECIFIC ENERGY EFFICIENCY MEASURES FOR HOUSEHOLDS AT OR BELOW 150% OF THE FEDERAL POVERTY INCOME GUIDELINES. THE NUMBER OF MEASURES SHALL BE PROPORTIONATE TO THOSE HOUSEHOLDS' SHARE OF THE TOTAL ENERGY USAGE IN THIS COMMONWEALTH. THE ELECTRIC DISTRIBUTION COMPANY SHALL COORDINATE MEASURES UNDER THIS CLAUSE WITH OTHER PROGRAMS

ADMINISTERED BY THE COMMISSION OR ANOTHER FEDERAL OR STATE AGENCY. THE EXPENDITURES OF AN ELECTRIC DISTRIBUTION COMPANY UNDER THIS CLAUSE SHALL BE IN ADDITION TO EXPENDITURES MADE UNDER 52 PA. CODE CH. 58 (RELATING TO RESIDENTIAL LOW INCOME USAGE REDUCTION PROGRAMS).

(H) INCLUDE A PROPOSED COST-RECOVERY TARIFF MECHANISM TO FUND THE ENERGY EFFICIENCY AND CONSERVATION MEASURES AND TO ENSURE RECOVERY OF THE PRUDENT AND REASONABLE COSTS OF THE PLAN AS APPROVED BY THE COMMISSION.

(I) A DEMONSTRATION THAT THE PLAN IS COST-EFFECTIVE USING A TOTAL RESOURCE COST TEST OR OTHER COST-BENEFIT ANALYSIS APPROVED BY THE COMMISSION AND PROVIDES A DIVERSE CROSS SECTION OF ALTERNATIVES FOR CUSTOMERS OF ALL RATE CLASSES.

(J) REQUIRE AN ANNUAL INDEPENDENT EVALUATION OF THE PERFORMANCE OF THE COST-EFFECTIVENESS OF THE PLAN AND A FULL REVIEW OF THE FIVE-YEAR RESULTS OF THE PLAN AND, TO THE EXTENT PRACTICABLE, HOW THE PLAN WILL BE ADJUSTED ON A GOING-FORWARD BASIS AS A RESULT OF THE EVALUATION.

(II) A NEW PLAN SHALL BE FILED WITH THE COMMISSION EVERY FIVE YEARS OR AS OTHERWISE REQUIRED BY THE COMMISSION. THE PLAN SHALL SET FORTH THE MANNER IN WHICH THE COMPANY WILL MEET THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(III) NO MORE THAN 2% OF FUNDS AVAILABLE TO IMPLEMENT A PLAN UNDER THIS SUBSECTION SHALL BE ALLOCATED

FOR EXPERIMENTAL EQUIPMENT OR DEVICES.

(2) THE COMMISSION SHALL DIRECT AN ELECTRIC DISTRIBUTION COMPANY TO MODIFY OR TERMINATE ANY PART OF A PLAN APPROVED UNDER THIS SECTION IF, AFTER AN ADEQUATE PERIOD FOR IMPLEMENTATION, THE COMMISSION DETERMINES THAT AN ENERGY EFFICIENCY OR CONSERVATION MEASURE INCLUDED IN THE PLAN IS NOT EFFECTIVE.

(3) IF PART OF A PLAN IS MODIFIED OR TERMINATED UNDER PARAGRAPH (2), THE ELECTRIC DISTRIBUTION COMPANY SHALL SUBMIT A REVISED PLAN DESCRIBING ACTIONS TO BE TAKEN TO OFFER SUBSTITUTE MEASURES OR TO INCREASE THE AVAILABILITY OF EXISTING MEASURES IN THE PLAN TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(C) REDUCTIONS IN CONSUMPTION.--EACH ELECTRIC DISTRIBUTION COMPANY SHALL REDUCE CONSUMPTION AS FOLLOWS:

(1) BY MAY 31, 2011, EACH ELECTRIC DISTRIBUTION COMPANY SHALL REDUCE ITS TOTAL ANNUAL WEATHER-NORMALIZED DELIVERIES TO RETAIL CUSTOMERS BY A MINIMUM OF 1%. THE 1% LOAD REDUCTION IN CONSUMPTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S EXPECTED LOAD AS FORECASTED BY THE COMMISSION FOR JUNE 1, 2007 THROUGH MAY 31, 2008, WITH PROVISIONS MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOADS THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE.

(2) BY MAY 31, 2013, EACH ELECTRIC DISTRIBUTION COMPANY SHALL REDUCE ITS TOTAL ANNUAL WEATHER-NORMALIZED DELIVERIES TO RETAIL CUSTOMERS BY A MINIMUM OF 2.5%. THE 2.5% LOAD REDUCTION IN CONSUMPTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S EXPECTED LOAD AS FORECASTED BY THE COMMISSION FOR JUNE 1, 2007, THROUGH MAY 31, 2008, WITH PROVISION MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOADS THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE.

(3) BY NOVEMBER 30, 2013, THE COMMISSION SHALL EVALUATE THE COSTS AND BENEFITS OF THE PROGRAM ESTABLISHED UNDER SUBSECTION (A) AND ENERGY EFFICIENCY AND CONSERVATION PLANS SUBMITTED TO THE PROGRAM. THE EVALUATION SHALL BE CONSISTENT WITH A TOTAL RESOURCE COST TEST OR A COST VERSUS BENEFIT MEASUREMENT DETERMINED BY THE COMMISSION. IF THE COMMISSION DETERMINES THAT THE BENEFITS OF THE PROGRAM EXCEED THE COSTS, THE COMMISSION SHALL ADOPT ADDITIONAL INCREMENTAL REQUIRED REDUCTIONS IN CONSUMPTION FOR THE PERIOD ENDING MAY 31, 2018.

(4) AFTER MAY 31, 2018, THE COMMISSION SHALL CONTINUE TO EVALUATE THE COSTS AND BENEFITS OF THE PROGRAM ESTABLISHED UNDER SUBSECTION (A) AND ENERGY EFFICIENCY AND CONSERVATION PLANS APPROVED UNDER SUBSECTION (A). IF THE COMMISSION DETERMINES THAT THE BENEFITS OF THE PROGRAM EXCEED THE COSTS, THE COMMISSION MAY REQUIRE AND APPROVE ADDITIONAL PLANS TO ACHIEVE INCREMENTAL REQUIREMENTS FOR REDUCTION IN CONSUMPTION FOR ELECTRIC DISTRIBUTION COMPANIES. EACH PLAN SHALL BE FOR A TERM NOT TO EXCEED FIVE YEARS.

(D) PEAK DEMAND.--EACH ELECTRIC DISTRIBUTION COMPANY SHALL IMPLEMENT ENERGY EFFICIENCY AND CONSERVATION MEASURES TO ACHIEVE THE FOLLOWING REDUCTIONS IN CONSUMPTION:

(1) BY MAY 31, 2013, EACH ENERGY DISTRIBUTION COMPANY SHALL REDUCE ITS WEATHER-NORMALIZED DELIVERIES TO RETAIL CUSTOMERS BY A MINIMUM OF 4% IN THE 100 HOURS OF HIGHEST DEMAND. THE REDUCTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S PEAK DEMAND IN THE 100 HOURS OF GREATEST DEMAND FOR JUNE 1, 2007, THROUGH MAY 31, 2008.

(2) BY NOVEMBER 30, 2013, THE COMMISSION SHALL COMPARE THE TOTAL COSTS OF ENERGY EFFICIENCY AND CONSERVATION PLANS IMPLEMENTED UNDER THIS SECTION TO THE TOTAL SAVINGS IN ENERGY

AND CAPACITY COSTS TO RETAIL CUSTOMERS IN THIS COMMONWEALTH. IF THE COMMISSION DETERMINES THAT THE BENEFITS OF THE MEASURES EXCEED THE COSTS, THE COMMISSION SHALL SET ADDITIONAL INCREMENTAL REQUIREMENTS FOR REDUCTION IN PEAK DEMAND FOR THE 100 HOURS OF GREATEST DEMAND OR AN ALTERNATIVE REDUCTION APPROVED BY THE COMMISSION. REDUCTIONS IN

CONSUMPTION SHALL BE MEASURED FROM THE ELECTRIC DISTRIBUTION COMPANY'S PEAK DEMAND FOR THE PERIOD FROM JUNE 1, 2011, THROUGH MAY 31, 2012. THE REDUCTIONS IN CONSUMPTION REQUIRED BY THE COMMISSION SHALL BE ACCOMPLISHED NO LATER THAN MAY 31, 2017.

(E) COMMISSION APPROVAL.--THE COMMISSION SHALL APPROVE OR DISAPPROVE A PLAN FILED UNDER SUBSECTION (B) WITHIN 120 DAYS OF SUBMISSION. THE FOLLOWING SHALL APPLY TO AN ORDER DISAPPROVING A PLAN:

(1) THE COMMISSION SHALL DESCRIBE IN DETAIL THE REASONS FOR THE DISAPPROVAL.

(2) THE ELECTRIC DISTRIBUTION COMPANY SHALL HAVE 60 DAYS TO FILE A REVISED PLAN TO ADDRESS THE DEFICIENCIES IDENTIFIED BY THE COMMISSION.

(F) PENALTIES.--

(1) THE FOLLOWING SHALL APPLY FOR FAILURE TO SUBMIT A PLAN:

(I) AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO FILE A PLAN UNDER SUBSECTION (B) SHALL BE SUBJECT TO A CIVIL PENALTY OF $100,000 PER DAY UNTIL THE PLAN IS FILED.

(II) AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO FILE A REVISED PLAN UNDER SUBSECTION (E)(2) SHALL BE SUBJECT TO A CIVIL PENALTY OF $100,000 PER DAY UNTIL THE

PLAN IS FILED.

(III) PENALTIES COLLECTED UNDER THIS PARAGRAPH SHALL BE DEPOSITED IN THE LOW-INCOME ELECTRIC CUSTOMER ASSISTANCE PROGRAM OF THE ENERGY DISTRIBUTION COMPANY FOR THE RESPECTIVE SERVICE TERRITORY.

(2) THE FOLLOWING SHALL APPLY TO AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO ACHIEVE THE REDUCTIONS IN CONSUMPTION REQUIRED UNDER SUBSECTION (C) OR (D):

(I) THE ELECTRIC DISTRIBUTION COMPANY SHALL BE SUBJECT TO A CIVIL PENALTY OF UP TO $5,000,000 FOR FAILURE TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D). ANY PENALTY PAID BY AN ELECTRIC DISTRIBUTION COMPANY UNDER THIS SUBPARAGRAPH SHALL NOT BE RECOVERABLE FROM RATEPAYERS.

(II) IF AN ELECTRIC DISTRIBUTION COMPANY FAILS TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D) BY 2013, RESPONSIBILITY TO ACHIEVE THE REDUCTIONS IN CONSUMPTION SHALL BE TRANSFERRED TO THE COMMISSION. THE COMMISSION SHALL DO ALL OF THE FOLLOWING:

(A) IMPLEMENT A PLAN TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D).

(B) CONTRACT WITH THIRD-PARTY ENTITIES AS NECESSARY TO IMPLEMENT ANY PORTION OF THE PLAN.

(III) THE PROVISIONS OF SUBPARAGRAPH (II) SHALL APPLY IN EACH SUBSEQUENT FIVE-YEAR PERIOD IF THE ELECTRIC DISTRIBUTION COMPANY FAILS TO ACHIEVE THE REDUCTION STANDARDS UNDER SUBSECTION (C) OR (D).

(G) LIMITATION ON COSTS.--THE TOTAL COST OF ANY PLAN REQUIRED UNDER THIS SECTION SHALL NOT EXCEED 2% OF THE ELECTRIC

DISTRIBUTION COMPANY'S TOTAL ANNUAL REVENUE AS OF DECEMBER 31, 2006. NO MORE THAN 1% OF THE 2% OF THE COMPANY'S TOTAL ANNUAL REVENUE MAY BE USED FOR THE ADMINISTRATIVE COSTS OF THE ELECTRIC DISTRIBUTION COMPANY. THE LIMITATION UNDER THIS PARAGRAPH SHALL NOT INCLUDE THE COST OF LOW-INCOME USAGE REDUCTION PROGRAMS ESTABLISHED UNDER 52 PA. CODE CH. 58 (RELATING TO RESIDENTIAL LOW INCOME USAGE REDUCTION PROGRAMS).

(H) REPORT.--THE FOLLOWING SHALL APPLY:

(1) EACH ELECTRIC DISTRIBUTION COMPANY SHALL SUBMIT AN ANNUAL REPORT TO THE COMMISSION RELATING TO THE RESULTS OF THE ENERGY EFFICIENCY AND CONSERVATION PLAN WITHIN THE ELECTRIC DISTRIBUTION SERVICE TERRITORY. THE REPORT SHALL INCLUDE ALL OF THE FOLLOWING:

(I) DOCUMENTATION OF PROGRAM EXPENDITURES.

(II) MEASUREMENT AND VERIFICATION OF ENERGY SAVINGS UNDER THE PLAN.

(III) EVALUATION OF THE COST-EFFECTIVENESS OF EXPENDITURES.

(IV) ANY OTHER INFORMATION REQUIRED BY THE COMMISSION.

(2) BEGINNING FIVE YEARS FOLLOWING THE EFFECTIVE DATE OF THIS SECTION AND ANNUALLY THEREAFTER, THE COMMISSION SHALL SUBMIT A REPORT TO THE CONSUMER PROTECTION AND PROFESSIONAL LICENSURE COMMITTEE OF THE SENATE AND THE CONSUMER AFFAIRS COMMITTEE OF THE HOUSE OF REPRESENTATIVES.

(I) EXISTING FUNDING SOURCES.--EACH ELECTRIC DISTRIBUTION COMPANY SHALL PROVIDE A LIST OF ALL ELIGIBLE FEDERAL AND STATE FUNDING PROGRAMS.

(J) RECOVERY.--IN NO CASE SHALL DECREASED REVENUES OF AN ELECTRIC DISTRIBUTION COMPANY DUE TO REDUCED ENERGY CONSUMPTION

OR CHANGES IN ENERGY DEMAND BE CONSIDERED A RECOVERABLE COST.

(K) APPLICABILITY.--THIS SECTION SHALL NOT APPLY TO AN ELECTRIC DISTRIBUTION COMPANY WITH FEWER THAN 100,000 CUSTOMERS.

(L) DEFINITIONS.--AS USED IN THIS SECTION, THE FOLLOWING WORDS AND PHRASES SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SUBSECTION:

"ELECTRIC DISTRIBUTION COMPANY TOTAL ANNUAL REVENUE." AMOUNTS PAID TO THE ELECTRIC DISTRIBUTION COMPANY FOR GENERATION, TRANSMISSION, DISTRIBUTION AND SURCHARGES BY RETAIL CUSTOMERS.

"ENERGY EFFICIENCY AND CONSERVATION MEASURES."

(1) TECHNOLOGIES, MANAGEMENT PRACTICES OR OTHER MEASURES EMPLOYED BY RETAIL CUSTOMERS THAT REDUCE ELECTRICITY CONSUMPTION OR DEMAND IF ALL OF THE FOLLOWING APPLY:

(I) THE TECHNOLOGY, PRACTICE OR OTHER MEASURE IS INSTALLED ON OR AFTER THE EFFECTIVE DATE OF THIS SECTION AT THE LOCATION OF A RETAIL CUSTOMER.

(II) THE TECHNOLOGY, PRACTICE OR OTHER MEASURE REDUCES CONSUMPTION OF ENERGY BY THE RETAIL CUSTOMER.

(III) THE COST OF THE ACQUISITION OR INSTALLATION OF THE MEASURE IS DIRECTLY INCURRED IN WHOLE OR IN PART BY THE ELECTRIC DISTRIBUTION COMPANY.

(2) ENERGY EFFICIENCY AND CONSERVATION MEASURES SHALL INCLUDE SOLAR OR SOLAR PHOTOVOLTAIC PANELS, ENERGY EFFICIENT WINDOWS AND DOORS, ENERGY EFFICIENT LIGHTING, INCLUDING EXIT SIGN RETROFIT, HIGH BAY FLUORESCENT RETROFIT AND PEDESTRIAN AND TRAFFIC SIGNAL CONVERSION, GEOTHERMAL HEATING, INSULATION, AIR SEALING, REFLECTIVE ROOF COATINGS, ENERGY EFFICIENT HEATING AND COOLING EQUIPMENT OR SYSTEMS AND ENERGY EFFICIENT APPLIANCES AND OTHER TECHNOLOGIES, PRACTICES OR

MEASURES APPROVED BY THE COMMISSION.

"PEAK DEMAND." THE HIGHEST ELECTRICAL REQUIREMENT OCCURRING DURING A SPECIFIED PERIOD. FOR AN ELECTRIC DISTRIBUTION COMPANY, THE TERM SHALL MEAN THE SUM OF THE METERED CONSUMPTION FOR ALL RETAIL CUSTOMERS OVER THAT PERIOD.

"QUALITY ASSURANCE." ALL OF THE FOLLOWING:

(1) THE AUDITING OF BUILDINGS, EQUIPMENT AND PROCESSES TO DETERMINE THE COST-EFFECTIVENESS OF ENERGY EFFICIENCY AND CONSERVATION MEASURES USING NATIONALLY RECOGNIZED TOOLS AND CERTIFICATION PROGRAMS.

(2) INDEPENDENT INSPECTION OF COMPLETED ENERGY EFFICIENCY AND CONSERVATION MEASURES COMPLETED BY THIRD-PARTY ENTITIES TO EVALUATE THE QUALITY OF THE COMPLETED MEASURE.

"REAL-TIME PRICE." A RATE THAT DIRECTLY REFLECTS THE DIFFERENT COST OF ENERGY DURING EACH HOUR.

"THIRD-PARTY ENTITY." AN ENTITY WITH NO DIRECT OR INDIRECT OWNERSHIP, PARTNERSHIP OR OTHER AFFILIATED INTEREST WITH AN ELECTRIC DISTRIBUTION COMPANY.

"TIME-OF-USE RATE." A RATE THAT REFLECTS THE COSTS OF SERVING CUSTOMERS DURING DIFFERENT TIME PERIODS, INCLUDING OFF-PEAK AND ON-PEAK PERIODS, BUT NOT AS FREQUENTLY AS EACH HOUR.

"TOTAL RESOURCE COST TEST." A STANDARD TEST THAT IS MET IF,

OVER THE EFFECTIVE LIFE OF EACH PLAN NOT TO EXCEED FIVE YEARS, THE AVOIDED MONETARY COSTS OF SUPPLYING ELECTRICITY ARE GREATER THAN THE MONETARY COSTS OF ENERGY EFFICIENCY MEASURES AND CONSERVATION OF CONSUMPTION.

SECTION 3. SECTION 2807(E) OF TITLE 66 IS AMENDED AND THE SECTION IS AMENDED BY ADDING SUBSECTIONS TO READ:

§ 2807. DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.

* * *

(E) OBLIGATION TO SERVE.--[AN ELECTRIC DISTRIBUTION COMPANY'S] A DEFAULT SERVICE PROVIDER'S OBLIGATION TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE FOLLOWING [IMPLEMENTATION OF RESTRUCTURING AND THE CHOICE OF ALTERNATIVE GENERATION BY A CUSTOMER] THE EXPIRATION OF A GENERATION RATE CAP SPECIFIED UNDER SECTION 2804(4) (RELATING TO STANDARDS FOR RESTRUCTURING OF ELECTRIC INDUSTRY) OR A RESTRUCTURING PLAN UNDER SECTION 2806(F) (RELATING TO IMPLEMENTATION, PILOT PROGRAMS AND PERFORMANCE-BASED RATES) IS REVISED AS FOLLOWS:

(1) WHILE AN ELECTRIC DISTRIBUTION COMPANY COLLECTS EITHER A COMPETITIVE TRANSITION CHARGE OR AN INTANGIBLE TRANSITION CHARGE OR UNTIL 100% OF ITS CUSTOMERS HAVE CHOICE, WHICHEVER IS LONGER, THE ELECTRIC DISTRIBUTION COMPANY SHALL CONTINUE TO HAVE THE FULL OBLIGATION TO SERVE, INCLUDING THE CONNECTION OF CUSTOMERS, THE DELIVERY OF ELECTRIC ENERGY AND THE PRODUCTION OR ACQUISITION OF ELECTRIC ENERGY FOR CUSTOMERS.

[(2) AT THE END OF THE TRANSITION PERIOD, THE COMMISSION SHALL PROMULGATE REGULATIONS TO DEFINE THE ELECTRIC DISTRIBUTION COMPANY'S OBLIGATION TO CONNECT AND DELIVER AND ACQUIRE ELECTRICITY UNDER PARAGRAPH (3) THAT WILL EXIST AT THE END OF THE PHASE-IN PERIOD.

(3) IF A CUSTOMER CONTRACTS FOR ELECTRIC ENERGY AND IT IS NOT DELIVERED OR IF A CUSTOMER DOES NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER, THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER SHALL ACQUIRE ELECTRIC ENERGY AT PREVAILING MARKET PRICES TO SERVE THAT CUSTOMER AND SHALL RECOVER FULLY ALL REASONABLE COSTS.]

(3.1) (I) FOLLOWING THE EXPIRATION OF AN ELECTRIC

DISTRIBUTION COMPANY'S OBLIGATION TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE TO RETAIL CUSTOMERS AT CAPPED RATES, IF A CUSTOMER CONTRACTS FOR ELECTRIC GENERATION SUPPLY SERVICE AND THE CHOSEN ELECTRIC GENERATION SUPPLIER DOES NOT PROVIDE THE SERVICE OR IF A CUSTOMER DOES NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER, THE DEFAULT SERVICE PROVIDER SHALL PROVIDE ELECTRIC GENERATION SUPPLY SERVICE TO THAT CUSTOMER PURSUANT TO A COMMISSION-APPROVED COMPETITIVE PROCUREMENT PLAN. THE ELECTRIC POWER ACQUIRED SHALL BE PROCURED THROUGH COMPETITIVE PROCUREMENT PROCESSES AND SHALL INCLUDE ONE OR MORE OF THE FOLLOWING:

(A) AUCTIONS.

(B) REQUESTS FOR PROPOSAL.

(C) BILATERAL AGREEMENTS ENTERED INTO AT THE SOLE DISCRETION OF THE DEFAULT SERVICE PROVIDER WHICH SHALL BE AT PRICES WHICH ARE:

(I) NO GREATER THAN THE COST OF OBTAINING GENERATION UNDER COMPARABLE TERMS IN THE WHOLESALE MARKET, AS DETERMINED BY THE COMMISSION AT THE TIME OF EXECUTION OF THE CONTRACT; OR

(II) CONSISTENT WITH A COMMISSION-APPROVED COMPETITION PROCUREMENT PROCESS. ANY AGREEMENT BETWEEN AFFILIATED PARTIES SHALL BE SUBJECT TO REVIEW AND APPROVAL OF THE PENNSYLVANIA PUBLIC UTILITY COMMISSION UNDER CHAPTER 21 (RELATING TO RELATIONS WITH AFFILIATED INTERESTS). IN NO CASE SHALL THE COST OF OBTAINING GENERATION FROM ANY AFFILIATED INTEREST BE GREATER THAN THE COST OF

OBTAINING GENERATION UNDER COMPARABLE TERMS IN

THE WHOLESALE MARKET AT THE TIME OF EXECUTION OF THE CONTRACT.

(II) THE PROVISIONS OF THIS PARAGRAPH SHALL APPLY TO ANY TYPE OF FUEL PURCHASED BY A DEFAULT SERVICE PROVIDER TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE, INCLUDING FUEL REQUIRED TO BE PURCHASED UNDER THE ACT OF NOVEMBER 30, 2004 (P.L.1672, NO.213), KNOWN AS THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT.

(3.2) THE ELECTRIC POWER PROCURED PURSUANT TO PARAGRAPH (3.1) SHALL INCLUDE A PRUDENT MIX OF THE FOLLOWING:

(I) SPOT MARKET PURCHASES.

(II) SHORT-TERM CONTRACTS.

(III) LONG-TERM PURCHASE CONTRACTS, ENTERED INTO AS A RESULT OF AN AUCTION, REQUEST FOR PROPOSAL OR BILATERAL CONTRACT THAT IS FREE OF UNDUE INFLUENCE, DURESS OR FAVORITISM, OF NOT LESS THAN THREE AND NOT MORE THAN 20 YEARS, UNLESS THE COMMISSION DETERMINES A LONGER TERM IS NECESSARY FOR THE RELIABILITY IN THE ACQUISITION OF GENERATION AND IT IS IN THE BEST INTEREST OF CONSUMERS TO EXTEND THE TERM OF THE CONTRACT BEYOND 20 YEARS. THE DEFAULT SERVICE PROVIDER SHALL HAVE SOLE DISCRETION TO DETERMINE THE SOURCE, FUEL TYPE AND LENGTH OF CONTRACT.

(3.3) THE PRUDENT MIX OF CONTRACTS ENTERED INTO PURSUANT TO PARAGRAPH (3.2) SHALL BE DESIGNED TO ENSURE:

(I) ADEQUATE AND RELIABLE SERVICE.

(II) THE LEAST COST TO CUSTOMERS OVER TIME.

(III) COMPLIANCE WITH THE REQUIREMENTS OF PARAGRAPH (3.1).

(3.4) THE DEFAULT SERVICE PROVIDER SHALL FILE A PLAN FOR COMPETITIVE PROCUREMENT WITH THE COMMISSION AND OBTAIN

COMMISSION APPROVAL OF THE PLAN CONSIDERING THE STANDARDS IN PARAGRAPHS (3.1), (3.2) AND (3.3) BEFORE THE COMPETITIVE PROCESS IS IMPLEMENTED. THE COMMISSION SHALL HOLD HEARINGS AS NECESSARY ON THE PROPOSED PLAN. IF THE COMMISSION FAILS TO ISSUE A FINAL ORDER ON THE PLAN WITHIN NINE MONTHS OF THE DATE THAT THE PLAN IS FILED, THE PLAN SHALL BE DEEMED TO BE APPROVED AND THE DEFAULT SERVICE PROVIDER MAY IMPLEMENT THE PLAN AS FILED. COSTS INCURRED THROUGH AN APPROVED COMPETITIVE PROCUREMENT PLAN SHALL BE DEEMED TO BE THE LEAST COST OVER TIME AS REQUIRED UNDER PARAGRAPH (3.3).

(3.5) AT THE TIME THE COMMISSION EVALUATES THE PLAN AND PRIOR TO APPROVAL, IN DETERMINING IF THE DEFAULT ELECTRIC SERVICE PROVIDER'S PLAN OBTAINS GENERATION SUPPLY AT THE LEAST COST, THE COMMISSION SHALL CONSIDER THE DEFAULT SERVICE PROVIDER'S OBLIGATION TO PROVIDE ADEQUATE AND RELIABLE SERVICE TO THE CUSTOMERS AND THAT THE DEFAULT SERVICE PROVIDER HAS OBTAINED A PRUDENT MIX OF CONTRACTS TO OBTAIN LEAST COST ON LONG-TERM, SHORT-TERM AND SPOT MARKET BASIS AND SHALL MAKE SPECIFIC FINDINGS WHICH SHALL INCLUDE THE FOLLOWING:

(I) THE DEFAULT SERVICE PROVIDER'S PLAN INCLUDES PRUDENT STEPS NECESSARY TO NEGOTIATE FAVORABLE GENERATION SUPPLY CONTRACTS.

(II) THE DEFAULT SERVICE PROVIDER'S PLAN INCLUDES PRUDENT STEPS NECESSARY TO OBTAIN LEAST COST GENERATION SUPPLY CONTRACTS ON A LONG-TERM, SHORT-TERM AND SPOT MARKET BASIS.

(III) NEITHER THE DEFAULT SERVICE PROVIDER NOR ITS AFFILIATED INTEREST HAS WITHHELD OR ASKED TO WITHHOLD FROM THE MARKET ANY GENERATION SUPPLY WHICH SHOULD HAVE

BEEN UTILIZED AS PART OF THE LEAST COST PROCUREMENT POLICY.

(3.6) NOTWITHSTANDING SECTIONS 508 (RELATING TO POWER OF COMMISSION TO VARY, REFORM AND REVISE CONTRACTS) AND 2102 (RELATING TO APPROVAL OF CONTRACTS WITH AFFILIATED INTERESTS), THE COMMISSION SHALL NOT MODIFY CONTRACTS OR

DISALLOW COSTS ASSOCIATED WITH AN APPROVED PROCUREMENT PROCESS WHEN IT HAS REVIEWED AND APPROVED THE RESULTS OF THE PROCUREMENT.

(3.7) NOTWITHSTANDING ANY OTHER PROVISION OF THIS TITLE TO THE CONTRARY, THE COMMISSION MAY MODIFY CONTRACTS OR DISALLOW COSTS WHEN THE PARTY SEEKING RECOVERY OF THE COSTS IS AT FAULT ASSOCIATED WITH CONTRACTS ENTERED INTO PURSUANT TO A COMMISSION-APPROVED PROCUREMENT PLAN IF THE COMMISSION DETERMINES AFTER A HEARING THAT:

(I) THE CONTRACT HAS NOT BEEN IMPLEMENTED OR APPROVED OR DOES NOT COMPLY WITH THE COMMISSION-APPROVED PROCUREMENT PLAN; OR

(II) THERE HAS BEEN FRAUD, COLLUSION OR MARKET MANIPULATION WITH REGARD TO THESE CONTRACTS.

(3.8) THE DEFAULT SERVICE PROVIDER SHALL HAVE THE RIGHT TO RECOVER ON A FULL AND CURRENT BASIS, PURSUANT TO A RECONCILABLE AUTOMATIC ADJUSTMENT CLAUSE UNDER SECTION 1307 (RELATING TO SLIDING SCALE OF RATES; ADJUSTMENTS), ALL COSTS INCURRED UNDER THIS SECTION AND A COMMISSION-APPROVED COMPETITIVE PROCUREMENT PLAN.

(4) IF A CUSTOMER THAT CHOOSES AN ALTERNATIVE SUPPLIER AND SUBSEQUENTLY DESIRES TO RETURN TO THE LOCAL DISTRIBUTION COMPANY FOR GENERATION SERVICE, THE LOCAL DISTRIBUTION COMPANY SHALL TREAT THAT CUSTOMER EXACTLY AS IT WOULD ANY NEW

APPLICANT FOR ENERGY SERVICE.

(5) (I) NOTWITHSTANDING PARAGRAPH [(3)] (3.1), THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER MAY, IN ITS SOLE DISCRETION, OFFER LARGE CUSTOMERS WITH A PEAK DEMAND OF 15 MEGAWATTS OR GREATER AT ONE METER AT A LOCATION IN ITS SERVICE TERRITORY ANY NEGOTIATED RATE FOR SERVICE AT ALL OF THE CUSTOMERS' LOCATIONS WITHIN THE SERVICE TERRITORY FOR ANY DURATION AGREED UPON BY THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER AND THE LARGE CUSTOMER. THE COMMISSION SHALL PERMIT, BUT SHALL NOT REQUIRE, AN ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER TO PROVIDE SERVICE TO LARGE CUSTOMERS UNDER THIS PARAGRAPH. CONTRACT RATES ENTERED INTO UNDER THIS PARAGRAPH SHALL BE SUBJECT TO REVIEW BY THE COMMISSION IN ORDER TO ENSURE THAT ALL COSTS RELATED TO THE RATES ARE BORNE BY THE PARTIES TO THE CONTRACT AND THAT NO COSTS RELATED TO THE RATES ARE BORNE BY OTHER CUSTOMERS OR CUSTOMER CLASSES. IF NO COSTS RELATED TO THE RATES ARE BORNE BY OTHER CUSTOMERS OR CUSTOMER CLASSES, THE COMMISSION SHALL APPROVE THE CONTRACT WITHIN 90 DAYS OF ITS FILING, OR IT SHALL BE DEEMED APPROVED BY OPERATION OF LAW UPON EXPIRATION OF THE 90 DAYS. INFORMATION SUBMITTED UNDER THIS PARAGRAPH SHALL BE SUBJECT TO THE COMMISSION'S PROCEDURES FOR THE FILING OF CONFIDENTIAL AND PROPRIETARY INFORMATION.

(II) FOR PURPOSES OF PROVIDING SERVICE UNDER THIS PARAGRAPH TO CUSTOMERS WITH A PEAK DEMAND OF 20 MEGAWATTS OR GREATER AT ONE METER AT A LOCATION WITHIN THAT DISTRIBUTION COMPANY'S SERVICE TERRITORY, AN ELECTRIC

DISTRIBUTION COMPANY THAT HAS COMPLETED ITS RESTRUCTURING TRANSITION PERIOD AS OF THE EFFECTIVE DATE OF THIS PARAGRAPH MAY, IN ITS SOLE DISCRETION, ACQUIRE AN INTEREST IN A GENERATION FACILITY OR CONSTRUCT A GENERATION FACILITY SPECIFICALLY TO MEET THE ENERGY REQUIREMENTS OF THE CUSTOMERS, INCLUDING THE ELECTRIC REQUIREMENTS OF THE CUSTOMERS' OTHER BILLING LOCATIONS WITHIN ITS SERVICE TERRITORY. THE ELECTRIC DISTRIBUTION COMPANY MUST COMMENCE CONSTRUCTION OF THE GENERATION FACILITY OR CONTRACT TO ACQUIRE THE GENERATION INTEREST WITHIN THREE YEARS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, EXCEPT THAT THE ELECTRIC DISTRIBUTION COMPANY MAY ADD TO THE GENERATION FACILITIES IT COMMENCED CONSTRUCTION OR CONTRACTED TO ACQUIRE AFTER THIS THREE-

YEAR PERIOD TO SERVE ADDITIONAL LOAD OF CUSTOMERS FOR WHOM IT COMMENCED CONSTRUCTION OR CONTRACTED TO ACQUIRE GENERATION WITHIN THREE YEARS. NOTHING IN THIS PARAGRAPH REQUIRES OR AUTHORIZES THE COMMISSION TO REQUIRE AN ELECTRIC DISTRIBUTION COMPANY TO COMMENCE CONSTRUCTION OR ACQUIRE AN INTEREST IN A GENERATION FACILITY. THE ELECTRIC DISTRIBUTION COMPANY'S INTEREST IN THE GENERATION FACILITY IT BUILT OR CONTRACTED TO ACQUIRE SHALL BE NO LARGER THAN NECESSARY TO MEET PEAK DEMAND OF CUSTOMERS SERVED UNDER THIS SUBPARAGRAPH. DURING TIMES WHEN THE CUSTOMER'S DEMAND IS LESS THAN THE ELECTRIC DISTRIBUTION COMPANY'S GENERATION INTEREST, THE ELECTRIC DISTRIBUTION COMPANY MAY SELL EXCESS POWER ON THE WHOLESALE MARKET. AT NO TIME SHALL THE COSTS ASSOCIATED WITH THE GENERATING FACILITY INTERESTS BE INCLUDED IN RATE BASE OR OTHERWISE REFLECTED IN RATES. THE GENERATION

FACILITY INTERESTS SHALL NOT BE COMMISSION-REGULATED ASSETS.

(6) A DEFAULT SERVICE PLAN APPROVED BY THE COMMISSION PRIOR TO THE EFFECTIVE DATE OF THIS SECTION SHALL REMAIN IN EFFECT THROUGH ITS APPROVED TERM. AT ITS SOLE DISCRETION, THE DEFAULT SERVICE PROVIDER MAY PROPOSE AMENDMENTS TO ITS APPROVED PLAN THAT ARE CONSISTENT WITH THIS SECTION, AND THE COMMISSION SHALL ISSUE A DECISION WHETHER TO APPROVE OR DISAPPROVE THE PROPOSED AMENDMENTS WITHIN NINE MONTHS OF THE DATE THAT THE AMENDMENTS ARE FILED. IF THE COMMISSION FAILS TO ISSUE A FINAL ORDER WITHIN NINE MONTHS, THE AMENDMENTS SHALL BE DEEMED TO BE APPROVED AND THE DEFAULT SERVICE PROVIDER MAY IMPLEMENT THE AMENDMENTS AS FILED.

(7) THE DEFAULT SERVICE PROVIDER SHALL OFFER RESIDENTIAL AND SMALL BUSINESS CUSTOMERS A GENERATION SUPPLY SERVICE RATE THAT SHALL CHANGE NO MORE FREQUENTLY THAN ON A QUARTERLY BASIS. ALL DEFAULT SERVICE RATES SHALL BE REVIEWED BY THE COMMISSION TO ENSURE THAT THE COSTS OF PROVIDING SERVICE TO EACH CUSTOMER CLASS ARE NOT SUBSIDIZED BY ANY OTHER CLASS.

(F) SMART METER TECHNOLOGY AND TIME OF USE RATES.--

(1) WITHIN NINE MONTHS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, ELECTRIC DISTRIBUTION COMPANIES SHALL FILE A SMART METER TECHNOLOGY PROCUREMENT AND INSTALLATION PLAN WITH THE COMMISSION FOR APPROVAL. THE PLAN SHALL DESCRIBE THE SMART METER TECHNOLOGIES THE ELECTRIC DISTRIBUTION COMPANY PROPOSES TO INSTALL IN ACCORDANCE WITH PARAGRAPH (2).

(2) ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS:

(I) UPON REQUEST TO A CUSTOMER THAT AGREES TO PAY THE COST OF THE SMART METER.

(II) IN THE CONSTRUCTION OF A NEW RESIDENCE OR NEW BUILDING TO BE USED BY A COMMERCIAL CUSTOMER.

(III) IN ACCORDANCE WITH A SCHEDULE OF REPLACEMENT OF FULL DEPRECIATION OF EXISTING METERS.

(3) ELECTRIC DISTRIBUTION COMPANIES SHALL, WITH CUSTOMER CONSENT, MAKE AVAILABLE ELECTRONIC ACCESS TO CUSTOMER METER DATA TO THIRD PARTIES, INCLUDING ELECTRIC GENERATION SUPPLIERS AND PROVIDERS OF CONSERVATION AND LOAN MANAGEMENT SERVICES.

(4) AN ELECTRIC DISTRIBUTION COMPANY SHALL NOT BE PERMITTED TO RECOVER THE COSTS, AS DETERMINED BY THE COMMISSION, OF PROVIDING SMART METER TECHNOLOGY UNDER PARAGRAPH (2).

(5) IN NO EVENT SHALL LOST OR DECREASED REVENUES BY AN ELECTRIC DISTRIBUTION COMPANY DUE TO REDUCED ELECTRICITY CONSUMPTION OR SHIFTING ENERGY DEMAND BE CONSIDERED A COST OF SMART METER TECHNOLOGY.

(6) BY JANUARY 1, 2010, OR AT THE END OF THE APPLICABLE GENERATION RATE CAP PERIOD, WHICHEVER IS LATER, A DEFAULT SERVICE PROVIDER SHALL SUBMIT TO THE COMMISSION ONE OR MORE PROPOSED TIME-OF-USE RATES AND REAL-TIME PRICE PLANS. THE COMMISSION SHALL APPROVE OR MODIFY THE TIME-OF-USE RATES AND

REAL-TIME PRICE PLAN WITHIN SIX MONTHS OF SUBMITTAL. THE DEFAULT SERVICE PROVIDER SHALL OFFER THE RATES AND REAL-TIME PRICE PLAN TO ALL RESIDENTIAL AND COMMERCIAL CUSTOMERS THAT HAVE BEEN PROVIDED WITH SMART METER TECHNOLOGY WITHIN 60 DAYS OF INSTALLATION OF THE SMART METER TECHNOLOGY OR COMMISSION APPROVAL OF THE TIME-OF-USE RATES AND REAL-TIME PRICE PLAN, WHICHEVER IS LATER. RESIDENTIAL OR COMMERCIAL CUSTOMERS MAY ELECT TO PARTICIPATE IN TIME-OF-USE RATES OR REAL-TIME

PRICING. THE DEFAULT SERVICE PROVIDER SHALL SUBMIT AN ANNUAL REPORT TO THE COMMISSION ON THE PARTICIPATION IN THE TIME-OF-USE AND REAL-TIME PRICE PROGRAMS AND THE EFFICACY OF THE PROGRAMS IN AFFECTING ENERGY DEMAND AND CONSUMPTION AND THE EFFECT ON WHOLESALE MARKET PRICES.

(7) THE PROVISIONS OF THIS SUBSECTION SHALL NOT APPLY TO AN ELECTRIC DISTRIBUTION COMPANY WITH 100,000 OR FEWER CUSTOMERS.

(G) DEFINITION.--AS USED IN THIS SECTION, THE TERM "SMART METER TECHNOLOGY" MEANS TECHNOLOGY, INCLUDING METERING TECHNOLOGY AND NETWORK COMMUNICATIONS TECHNOLOGY CAPABLE OF BIDIRECTIONAL COMMUNICATION, THAT RECORDS ELECTRICITY USAGE ON AT LEAST AN HOURLY BASIS, INCLUDING RELATED ELECTRIC DISTRIBUTION SYSTEM UPGRADES TO ENABLE THE TECHNOLOGY. THE TECHNOLOGY SHALL PROVIDE CUSTOMERS WITH DIRECT ACCESS TO AND USE OF PRICE AND CONSUMPTION INFORMATION. THE TECHNOLOGY SHALL ALSO:

(1) DIRECTLY PROVIDE CUSTOMERS WITH INFORMATION ON THEIR HOURLY CONSUMPTION.

(2) ENABLE TIME-OF-USE RATES AND REAL-TIME PRICE PROGRAMS.

(3) EFFECTIVELY SUPPORT THE AUTOMATIC CONTROL OF THE CUSTOMER'S ELECTRICITY CONSUMPTION BY ONE OR MORE OF THE FOLLOWING AS SELECTED BY THE CUSTOMER:

(I) THE CUSTOMER;

(II) THE CUSTOMER'S UTILITY; OR

(III) A THIRD PARTY ENGAGED BY THE CUSTOMER OR THE CUSTOMER'S UTILITY.

(4) PROVIDE A MEANS TO OBTAIN REAL-TIME CONSUMPTION INFORMATION FROM A METER SUCH AS AN INSTALLED PORT OR OUTPUT FOR TRANSMITTING METER PULSE DATA EXTERNAL TO THE METER TO BE

USED BY THE CUSTOMER, THE ELECTRIC DISTRIBUTION COMPANY OR A THIRD PARTY ENGAGED BY THE CUSTOMER IN THE ELECTRIC DISTRIBUTION COMPANY.

SECTION 4. TITLE 66 IS AMENDED BY ADDING A SECTION TO READ:

§ 2813. PROCUREMENT OF POWER.

EXCEPT AS PROVIDED UNDER THE ACT OF NOVEMBER 30, 2004 (P.L.1672, NO.213), KNOWN AS THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT, THE COMMISSION MAY NOT ORDER A DEFAULT SERVICE PROVIDER TO PROCURE POWER FROM A SPECIFIC GENERATION SUPPLIER, FROM A SPECIFIC GENERATION FUEL TYPE OR FROM NEW GENERATION ONLY.

SECTION 5. THIS ACT SHALL TAKE EFFECT IN 60 DAYS.

Appendix L

SENATE AMENDED

PRIOR PRINTER'S NOS. 3089, 3176, 3218, 3233, 4429 PRINTER'S NO. 4526

THE GENERAL ASSEMBLY OF PENNSYLVANIA

HOUSE BILL

No. 2200 Session of 2008

INTRODUCED BY GEORGE, McCALL, BELFANTI, CALTAGIRONE, CONKLIN, DALEY, N. P. GOODMAN, HARHAI, HARKINS, KULA, MANDERINO, McGEEHAN, VITALI, J. WHITE, WALKO, SURRA, DeLUCA, DERMODY, GRUCELA, JOSEPHS, JAMES, GINGRICH, FREEMAN, K. SMITH, McILVAINE SMITH, YOUNGBLOOD AND FRANKEL, JANUARY 15, 2008

SENATOR TOMLINSON, CONSUMER PROTECTION AND PROFESSIONAL LICENSURE, IN SENATE, RE-REPORTED AS AMENDED, OCTOBER 7, 2008

AN ACT

Amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, ~~providing for recovery of certain labor relations expenses; further providing for definitions; providing for adoption of energy efficiency and demand side response; and further providing for duties of electric distribution companies. FURTHER PROVIDING FOR DEFINITIONS; PROVIDING FOR ENERGY EFFICIENCY AND CONSERVATION; FURTHER PROVIDING FOR DUTIES OF ELECTRIC DISTRIBUTION COMPANIES; AND PROVIDING FOR PROCUREMENT.~~ FURTHER PROVIDING FOR DIRECTOR OF OPERATIONS, SECRETARY, EMPLOYEES AND CONSULTANTS; REPEALING PROVISIONS RELATING TO OFFICE OF TRIAL STAFF; FURTHER PROVIDING FOR BUREAUS AND OFFICES; PROVIDING FOR OTHER BUREAUS, OFFICES AND POSITIONS; FURTHER PROVIDING FOR ELECTRIC UTILITY DEFINITIONS; PROVIDING FOR ENERGY EFFICIENCY AND CONSERVATION PROGRAM AND FOR ENERGY EFFICIENCY AND CONSERVATION; FURTHER PROVIDING FOR DUTIES OF ELECTRIC DISTRIBUTION COMPANIES AND FOR MARKET POWER REMEDIATION; AND PROVIDING FOR PROCUREMENT, FOR ADDITIONAL ALTERNATIVE ENERGY SOURCES AND FOR CARBON DIOXIDE SEQUESTRATION NETWORK.

THE GENERAL ASSEMBLY RECOGNIZES THE FOLLOWING PUBLIC POLICY FINDINGS AND DECLARES THAT THE FOLLOWING OBJECTIVES OF THE COMMONWEALTH ARE SERVED BY THIS ACT:

(1) THE HEALTH, SAFETY AND PROSPERITY OF ALL CITIZENS OF THIS COMMONWEALTH ARE INHERENTLY DEPENDENT UPON THE AVAILABILITY OF ADEQUATE, RELIABLE, AFFORDABLE, EFFICIENT AND ENVIRONMENTALLY SUSTAINABLE ELECTRIC SERVICE AT THE LEAST COST, TAKING INTO ACCOUNT ANY BENEFITS OF PRICE STABILITY, OVER TIME AND THE IMPACT ON THE ENVIRONMENT.

(2) IT IS IN THE PUBLIC INTEREST TO ADOPT ENERGY EFFICIENCY AND CONSERVATION MEASURES AND TO IMPLEMENT ENERGY PROCUREMENT REQUIREMENTS DESIGNED TO ENSURE THAT ELECTRICITY OBTAINED REDUCES THE POSSIBILITY OF ELECTRIC PRICE INSTABILITY, PROMOTES ECONOMIC GROWTH AND ENSURES AFFORDABLE AND AVAILABLE ELECTRIC SERVICE TO ALL RESIDENTS.

(3) IT IS IN THE PUBLIC INTEREST TO EXPAND THE USE OF ALTERNATIVE ENERGY AND TO EXPLORE THE FEASIBILITY OF NEW SOURCES OF ALTERNATIVE ENERGY TO PROVIDE ELECTRIC GENERATION IN THIS COMMONWEALTH.

The General Assembly of the Commonwealth of Pennsylvania hereby enacts as follows:

Section 1. Title 66 of the Pennsylvania Consolidated Statutes is amended by adding a section to read: <--

§ 1329. Recovery of certain labor relations expenses.

No public utility may charge its customers as a permissible operating expense for ratemaking purposes any portion of the direct or indirect cost of meetings, publications, consultants, attorneys or other professional services and expenses associated with the utility's efforts to dissuade the employees of the utility, or the employees of any affiliated interest of the utility as defined in section 2101 (relating to definition of affiliated interest), from becoming or remaining a member in, or otherwise being represented by, any labor union.

Section 2. Section 2803 of Title 66 is amended by adding

definitions to read:

§ 2803. Definitions.

The following words and phrases when used in this chapter shall have the meanings given to them in this section unless the context clearly indicates otherwise:

"Affiliated interest." As defined in section 2101 (relating to definition of affiliated interest).

* * *

"Cost effective." In relation to a program being evaluated, satisfaction of the total resource cost test.

* * *

"Demand side response." Load management technologies, management practices or other strategies employed by retail customers that decrease peak electricity demand or shift demand from on peak to off peak periods provided that:

(1) The measure is installed on or after the effective date of this section at the service location of a retail customer.

(2) The measure reduces the peak demand or cost of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

* * *

"Energy efficiency." Technologies, management practices or other strategies or measures employed by retail customers that reduce electricity consumption provided that:

(1) The measure is installed on or after the effective date of this definition at the service location of a retail customer.

(2) The measure reduces the consumption of energy by the retail customer.

(3) The costs of the acquisition or installation of the measure are directly incurred in whole or in part by the electric distribution company.

"Independent entity." An entity with no direct or indirect ownership, partnership or other affiliated interest with an electric distribution company.

"Peak demand." The highest electrical requirement occurring during a specified period. For an electric distribution company, the term means the sum of the metered consumption for all retail customers over that period.

"Real time price." A rate that directly reflects the different cost of energy during each hour.

* * *

"Smart meter technology." Technology, including, but not limited to, metering technology and network communications technology capable of bidirectional communication and that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. The technology shall provide customers with direct access to and use of price and consumption information. The technology shall also:

(1) Directly provide customers with information on their hourly consumption.

(2) Enable time of use rates and real time price programs.

(3) Effectively support the automatic control of the customer's electricity consumption by one or more of the following as selected by the customer:

(i) the customer;

(ii) the customer's utility; or

(iii) a third party engaged by the customer or the customer's utility.

"Time of use rate." A rate that reflects the costs of serving customers during different time periods, including off-peak and on peak periods, but not as frequently as each hour.

"Total resources cost test." A standard test that is met if, over the effective life of the program, the avoided supply side monetary costs are greater than the monetary costs of the demand side programs borne by both the electric distribution company and the participants.

* * *

Section 3. Title 66 is amended by adding a section to read:

§ 2806.1. Adoption of procedures encouraging energy efficiency and demand side response.

(a) Program.--The commission shall develop a program to provide for the implementation of cost effective programs that reduce energy demand and consumption within the service territories of all electric distribution companies throughout this Commonwealth. The program shall include, but is not limited to, the following:

(1) Selecting a program administrator to develop and oversee the delivery of energy efficiency and demand side response programs within the service territory of each electric distribution company within this Commonwealth.

(2) Implementing the necessary administrative and financial mechanisms that will enable the program administrator to develop and oversee the provision of energy efficiency and demand side response programs within the

service territory of each electric distribution company within this Commonwealth, including the levying of assessments in accordance with sections 510 (relating to assessment for regulatory expenses upon public utilities), 1307 (relating to sliding scale of rates; adjustments) and 1308 (relating to voluntary changes in rates). The commission shall not approve or implement and shall not assess or charge to customers the costs of energy efficiency or demand-response programs to the extent that the costs of such programs exceed 2% of the total annual revenues of the electric distribution company from all sources, including default service generation revenues as of January 1, 2007. This funding limit shall not include amounts provided for by the low income usage reduction programs established under regulations at 52 Pa. Code Ch. 58 (relating to residential low income usage reduction programs).

(3) Implementing the necessary administrative and financial mechanisms that facilitate a system of third party entities to deliver all or portions of the energy efficiency and demand side response programs within the service territory of each electric distribution company within this Commonwealth, including the levying of assessments in accordance with sections 510, 1307 and 1308. The commission may order the electric distribution company to pay the third-party entity for services rendered in an electric distribution company's respective service territory pursuant to this section. The electric distribution company may be a third party entity.

(b) Selection of program administrator.--The commission shall implement the following procedures when selecting a

program administrator:

(1) The commission shall prepare a request for proposals for a program administrator to provide for the development and delivery of the energy efficiency and demand side response programs in the service territories of all electric distribution companies and shall make the request for proposals available for public comment.

(2) The commission shall, within 60 days of the completion of the public comment period, issue the final request for proposals.

(3) The commission shall, based on a competitive bid process, select an independent entity to serve as the energy efficiency and demand side response program administrator.

(4) The commission shall include as a part of its agreement with the program administrator a system of performance parameters and a financial mechanism that provides incentives for exceeding established performance parameters and penalties for third parties not meeting established performance parameters.

(c) Powers and duties of program administrator. The program administrator shall have powers and duties assigned by the commission. The powers and duties shall include, but not be limited to:

(1) Soliciting through a competitive procurement process within each electric distribution company service territory a program of providing energy efficiency and demand side response programs to residential, commercial and industrial customers utilizing third party entities.

(2) Ensuring that each proposal includes, but is not limited to:

(i) A clear delineation of how the program will be conducted.

(ii) The types of specific program measures to be offered.

(iii) The cost and benefit of each program to be offered.

(iv) A process for monitoring and verifying results, data collection and management procedures, program evaluation processes and financial management strategies.

(3) In its review of each proposal received:

(i) Taking into account the unique circumstances of each electric distribution company's service territory.

(ii) Finding that each program is cost effective and that the portfolio of programs is designed to provide every affected customer class with the opportunity to participate and benefit economically.

(iii) Determining the cost effectiveness of energy efficiency and demand side response measures using the total resource cost test.

(4) Recommending to the commission those entities best suited to provide energy efficiency and demand side response programs within the service territory of each electric distribution company.

(5) In the event no qualified proposals are received that meet the required plan goals in an electric distribution company service territory to conduct the program activities:

(i) Issuing a subsequent request for proposals with plan goals that are reduced no more than necessary to obtain qualified proposals to provide program activities. The lowered plan goals for energy efficiency and demand

side response shall only be in effect for that year.

(ii) In subsequent years, utilizing the plan goals unless no qualified proposals are received to conduct the program activities that meet the plan goals, the program administrator shall issue a subsequent request for proposals in accordance with the procedures identified in this subparagraph.

(6) Executing agreements on behalf of the commission

with the selected entity in each electric distribution company service territory to conduct the energy efficiency and demand side response program. As part of these agreements the program administrator shall ensure that:

(i) The programs offered by the selected entity are provided equitably across all customer classes.

(ii) A clearly defined process for financial compensation for the entity delivering the program which is tied to defined goals for performance regarding program activities accomplished, energy cost savings on a per customer basis and utility wide basis and overall energy and peak demand reduction is established.

(iii) A system of incentives and penalties for performance of contractual activities above and below predetermined levels is in place.

(iv) There is a set contract term which may include an initial three year term with renewal terms of varied length.

(7) Submitting reports to the commission at such times and in such manner as the commission directs.

(d) Commission review of recommendations. The commission shall review the recommendations made by the program

administrator regarding those entities best suited to provide energy efficiency and demand side response programs within the service territory of each electric distribution company. The commission shall approve or disapprove the recommendations made by the program administrator.

(1) The commission review of the recommendations of the program administrator shall be limited to ensuring that:

(i) There is no evidence of fraud or market abuse.

(ii) Any costs entered into are borne by the appropriate parties and that costs, including the costs of subsection (c)(6)(iii) incentives, related to the provision of the contracted services are borne by the appropriate customer class.

(iii) There will be provided, in a cost effective manner, a program that provides energy efficiency and demand side response measures to all customer classes throughout the service territory of each electric distribution company.

(2) If the commission approves a third party entity to conduct the program, the commission shall ensure the program administrator finalizes the agreement between the commission and the third party entity selected to provide the program of energy efficiency and demand side response.

(3) In the event the commission disapproves the recommendation of the program administrator, the commission shall provide a rationale for this decision and direct the program administrator on a course of action.

(e) Plan goals. The program administrator shall ensure that each proposal submitted by a third party entity to deliver a program of energy efficiency and demand side response measures

includes meeting the following energy saving goals:

(1) The following relate to energy efficiency goals:

(i) By May 31, 2011, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 1%. This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2010, through May 31, 2011, based on load for the period June 1, 2007, through May 31, 2008, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve. The commission shall determine and make public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third-party entity meets the goals contained in this section through the implementation of a program of energy efficiency

measures throughout the service territory of the electric distribution company.

(ii) By May 31, 2013, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 2.5%. This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2012, through May 31, 2013, based on load for the period June 1, 2007, through May 31, 2008, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve. The commission shall determine and make public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third party

entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company.

(iii) By November 30, 2013, the program administrator shall evaluate the costs and benefits of these energy efficiency and conservation programs. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the program administrator, in consultation with the commission, shall set additional, incremental energy efficiency and conservation goals for the period ending May 31, 2018.

(iv) After May 31, 2018, the program administrator shall continue to evaluate the costs and benefits of efficiency and conservation measures and, in consultation with the commission, may adopt additional incremental load reduction standards for electric distribution companies.

(2) The following relate to demand side response measures:

(i) Cost effective demand side response measures to reduce peak demand by a minimum of 4% in the 100 hours of highest demand with provision made for weather adjustments and extraordinary load that the electric distribution company must serve shall be implemented in each electric distribution company's service territory. This reduction will be measured against the electric distribution company's peak demand in the 100 hours of greatest demand for June 1, 2007, through May 31, 2008. The reductions shall be accomplished by May 31, 2012.

(ii) By November 30, 2012, the program administrator shall compare the total costs of these demand side response measures to the total savings in energy and capacity costs to retail customers of this Commonwealth. If the benefits have been shown to exceed the costs, consistent with the total resource cost test, the commission shall order additional peak demand reductions for the 100 hours of greatest demand or an alternative measure adopted by the commission. The reductions shall be measured from the electric distribution company's peak demand for the period from June 1, 2011, through May 31, 2012. The mandated reductions shall be accomplished no later than May 31, 2017.

(iii) After May 31, 2017, the program administrator shall continue to evaluate the costs and benefits of demand side response measures and may, in consultation with the commission, adopt additional incremental peak load reduction standards.

(f) Measurements and verification. The commission shall establish standards by which the program administrator submits to the commission an annual report, which includes that information relating to the actions and results of the energy efficiency and demand side response programs undertaken within each electric distribution service territory by each third party

entity.

(1) The report shall include, but not be limited to:

(i) Documentation of program expenditures.

(ii) Measurement and verification of savings resulting from programs.

(iii) Evaluation of the cost effectiveness of

expenditures.

(iv) Any other information the commission may require pursuant to its rulemaking authority.

(2) The program administrator, upon consultation with the commission, shall direct a third party entity to modify or terminate a particular energy efficiency or a demand side response program if, after an adequate period for implementation of the program, the commission determines the program is not sufficiently meeting its goals and purposes.

(3) In the event an energy efficiency or demand side response program is terminated, the program administrator shall require the third party entity to submit a revised program describing the actions to be undertaken to either offer a substitute program or increase the availability of existing programs to make up for the effect of the terminated program on its overall program goals.

(g) Responsibilities of electric distribution companies.--Each electric distribution company that does not seek to be a third party entity shall:

(1) Cooperate with the program administrator as needed in its efforts to competitively procure the services of a third party entity to provide an energy efficiency and demand side response program within the service territory of the electric distribution company.

(2) Provide information necessary to effectively facilitate the work of the selected third party entity in conducting the energy efficiency and demand side response program.

(3) Provide assistance as may be requested by the program administrator in reviewing proposals from third party

entities seeking to provide energy efficiency and demand side response programs within their service territories.

(4) Provide assistance as may be requested by the program administrator to facilitate the successful execution of the contract agreement with the third party entities to provide an energy efficiency and demand side response program within their service territories.

(h) Recovery of administrative and program costs.--An electric distribution company may fully recover all administrative costs, including, but not limited to, costs incurred under subsections (a)(3) and (g)(1), (2), (3) and (4), that the commission determines are prudently incurred and reasonable in amount pursuant to implementing a program to deliver cost effective energy efficiency and demand side response activities through a third party entity. Program and administrative costs shall be recovered on a full and current basis by the electric distribution company from customers through a reconcilable automatic adjustment clause pursuant to section 1307. Energy efficiency and demand side resource programs shall be deemed to be a new service offered for the first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(i) Reporting. The commission shall submit an annual report to the General Assembly describing the results of the programs implemented by each of the electric distribution companies, including, but not limited to:

(1) The costs, benefits and reductions in energy costs.

(2) Energy use by customer class within this Commonwealth.

(3) Reductions in overall peak demand and projections

toward complying with the overall target reduction goals of this section.

(j) Definitions.--For purposes of this section, the term "electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

Section 4. Section 2807(e) of Title 66 is amended by adding a paragraph to read:

§ 2807. Duties of electric distribution companies.

* * *

(e) Obligation to serve.--* * *

(6) (i) Within nine months after the effective date of this paragraph, electric distribution companies shall file a smart meter technology procurement and installation plan with the commission for approval and make the plan available for public comment for a minimum of 30 days. The plan shall describe the smart meter technologies the electric distribution company proposes to install, how the smart meter technology meets the requirements of this paragraph and how the smart meter technology shall be installed according to this paragraph. In addition, the plan shall ensure that all smart meter technology installation and maintenance work shall be performed by adequately trained and qualified personnel and that, to the extent practical, such work shall be offered initially to employees of the electric distribution company.

(ii) Electric distribution companies shall furnish smart meter technology to:

(A) Customers responsible for 40% of the distribution company's annual peak demand within four years after the effective date of this paragraph.

(B) Customers responsible for 75% of the distribution company's annual peak demand within six years after the effective date of this paragraph.

(C) One hundred percent of its customers within ten years after the effective date of this paragraph.

Electric distribution companies shall, with customer consent, make available electronic access to customer meter data to third parties, including electric generation suppliers and providers of conservation and load management services.

(iii) Electric distribution companies shall be permitted to recover all reasonable and prudent costs, as determined by the commission, of providing smart meter technology, including annual deprecation and capital costs over the life of the smart meter technology, that are incurred after the effective date of this paragraph, less all operating and capital costs savings realized by the electric distribution company from the introduction and use of the smart meter technology. An electric distribution company may, at its option, recover such smart meter technology costs:

(A) through base rates, including a deferral for future base rate recovery of current costs, with carrying charges equal to 6%; or

(B) on a full and current basis through a reconcilable automatic adjustment clause under section 1307 (relating to sliding scale of rates; adjustments).

In no event shall lost or decreased revenues by an electric distribution company due to reduced electricity consumption or shifting energy demand be considered a cost of smart meter technology. Smart meter technology shall be deemed to be a new service offered for the first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(iv) By January 1, 2010, or at the end of the applicable generation rate cap period, whichever is later, a default service provider shall submit to the commission one or more proposed time of use rates and a real time price plan. The commission shall approve or modify the time of use rates and real time price plan within six months of submittal. The default service provider shall offer commission approved time of use rates and a real time price plan to all residential and commercial customers that have been provided with smart meter technology within 60 days of installation of the smart meter technology or commission approval of the time of use rates and a real time price plan, whichever is later. Customer participation in time of use rates or real time pricing shall be voluntary and shall only be provided with the affirmative consent of the customer. The default service provider shall submit an annual report to the commission on the participation in the time of use and real time price programs and the efficacy of the programs in affecting energy demand and consumption and the effect on wholesale market prices.

(v) For purposes of this paragraph, the term

"electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

Section 5. This act shall take effect immediately.

SECTION 1. SECTION 2803 OF TITLE 66 OF THE PENNSYLVANIA <--
CONSOLIDATED STATUTES IS AMENDED BY ADDING DEFINITIONS TO READ:
§ 2803. DEFINITIONS.

THE FOLLOWING WORDS AND PHRASES WHEN USED IN THIS CHAPTER SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SECTION UNLESS THE CONTEXT CLEARLY INDICATES OTHERWISE:

* * *

"BILATERAL CONTRACT." AN AGREEMENT, AS APPROVED BY THE PENNSYLVANIA PUBLIC UTILITY COMMISSION, REACHED BY TWO PARTIES, EACH ACTING IN ITS OWN INDEPENDENT SELF INTEREST, AS A RESULT OF NEGOTIATIONS FREE OF UNDUE INFLUENCE, DURESS OR FAVORITISM, IN WHICH THE ELECTRIC ENERGY SUPPLIER AGREES TO SELL AND THE ELECTRIC DISTRIBUTION COMPANY AGREES TO BUY A QUANTITY OF ELECTRIC ENERGY AT A SPECIFIED PRICE FOR A SPECIFIED PERIOD OF TIME UNDER TERMS AGREED TO BY BOTH PARTIES, AND WHICH FOLLOWS A STANDARD INDUSTRY TEMPLATE WIDELY ACCEPTED IN THE INDUSTRY OR VARIATIONS THERETO ACCEPTED BY THE PARTIES. STANDARD INDUSTRY TEMPLATES MAY INCLUDE THE EEI MASTER AGREEMENT FOR PHYSICAL ENERGY PURCHASES AND SALES AND THE ISDA MASTER AGREEMENT FOR FINANCIAL ENERGY PURCHASES AND SALES.

* * *

"DEFAULT SERVICE PROVIDER." AN ELECTRIC DISTRIBUTION COMPANY WITHIN ITS CERTIFIED SERVICE TERRITORY OR AN ALTERNATIVE SUPPLIER APPROVED BY THE PENNSYLVANIA PUBLIC UTILITY COMMISSION THAT PROVIDES GENERATION SERVICE TO RETAIL ELECTRIC CUSTOMERS

WHO:

(1) CONTRACT FOR ELECTRIC POWER, INCLUDING ENERGY AND CAPACITY, AND THE CHOSEN ELECTRIC GENERATION SUPPLIER DOES NOT SUPPLY THE SERVICE; OR

(2) DO NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER.

SECTION 2. TITLE 66 IS AMENDED BY ADDING A SECTION TO READ:
§ 2806.1. ENERGY EFFICIENCY AND CONSERVATION.

(A) PROGRAM. THE COMMISSION SHALL ADOPT A PROGRAM TO REQUIRE ELECTRIC DISTRIBUTION COMPANIES TO ADOPT AND IMPLEMENT COST EFFECTIVE ENERGY EFFICIENCY AND CONSERVATION PLANS TO REDUCE ENERGY DEMAND AND CONSUMPTION WITHIN THE SERVICE TERRITORIES OF ALL ELECTRIC DISTRIBUTION COMPANIES IN THIS COMMONWEALTH. THE PROGRAM SHALL INCLUDE:

(1) PROCEDURES FOR THE APPROVAL OF PLANS SUBMITTED UNDER SUBSECTION (B).

(2) A PLAN EVALUATION PROCESS INCLUDING A PROCESS TO MONITOR AND VERIFY DATA COLLECTION, QUALITY ASSURANCE AND RESULTS SUBMITTED.

(3) AN ANALYSIS OF THE COST AND BENEFIT OF EACH PLAN SUBMITTED UNDER SUBSECTION (B) IN ACCORDANCE WITH A TOTAL RESOURCE COST TEST.

(4) AN ANALYSIS OF HOW THE PROGRAM AND INDIVIDUAL PLANS WILL ENABLE EACH ELECTRIC DISTRIBUTION COMPANY TO ACHIEVE THE REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(5) STANDARDS TO ENSURE THAT EACH PLAN INCLUDES A VARIETY OF ENERGY EFFICIENCY AND CONSERVATION MEASURES AND WILL PROVIDE THE MEASURES EQUITABLY TO ALL CLASSES OF CUSTOMERS.

(6) PROCEDURES TO REVIEW ALL PROPOSED CONTRACTS PRIOR TO THE EXECUTION OF THE CONTRACT WITH THIRD PARTY ENTITIES TO IMPLEMENT THE PLAN. THE COMMISSION MAY ORDER THE MODIFICATION OF A PROPOSED CONTRACT TO ENSURE THAT THE PLAN IS ADEQUATE.

(7) PROCEDURES TO ENSURE COMPLIANCE WITH REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(8) A REQUIREMENT FOR THE PARTICIPATION OF THIRD PARTY ENTITIES IN THE IMPLEMENTATION OF ALL OR PART OF A PLAN.

(9) A PROCESS TO LINK REDUCTIONS IN CONSUMPTION TO THE COMPENSATION OF THIRD PARTY ENTITIES.

(10) PROCEDURES FOR THE LEVY OF ASSESSMENTS IN ACCORDANCE WITH SECTIONS 510 (RELATING TO ASSESSMENT FOR REGULATORY EXPENSES UPON PUBLIC UTILITIES) AND 1308 (RELATING TO VOLUNTARY CHANGES IN RATES) SUBJECT TO THE LIMITATIONS OF SUBSECTION (G) TO FUND PLANS FILED UNDER SUBSECTION (B) SUBJECT TO THE LIMITATIONS SET FORTH UNDER SUBSECTION (G).

(B) DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.

(1) (I) BY NOVEMBER 15, 2008, EACH ELECTRIC DISTRIBUTION COMPANY SHALL DEVELOP AND FILE AN ENERGY EFFICIENCY AND CONSERVATION PLAN WITH THE COMMISSION FOR APPROVAL TO MEET THE REQUIREMENTS OF SUBSECTION (A) AND THE REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D). THE PLAN SHALL BE IMPLEMENTED UPON APPROVAL BY THE COMMISSION AND SHALL COMPLY WITH ALL OF THE FOLLOWING:

(A) INCLUDE SPECIFIC PROPOSALS TO IMPLEMENT ENERGY EFFICIENCY AND CONSERVATION MEASURES TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(B) A MINIMUM OF 10% OF THE REQUIRED REDUCTIONS

IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D) SHALL BE OBTAINED FROM UNITS OF FEDERAL, STATE AND LOCAL GOVERNMENT, INCLUDING MUNICIPALITIES, SCHOOL DISTRICTS, INSTITUTIONS OF HIGHER EDUCATION AND NONPROFIT ENTITIES.

(C) THE MANNER IN WHICH PERFORMANCE WILL BE MEASURED, VERIFIED AND EVALUATED.

(D) THE MANNER IN WHICH THE PLAN WILL ACHIEVE THE REQUIREMENTS OF THE PROGRAM UNDER SUBSECTION (A) AND THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(E) INCLUDE A CONTRACT WITH ONE OR MORE THIRD-PARTY ENTITIES TO IMPLEMENT THE PLAN OR A PORTION OF THE PLAN AS APPROVED BY THE COMMISSION.

(F) INCLUDE ESTIMATES OF THE COST OF IMPLEMENTATION OF THE ENERGY EFFICIENCY AND CONSERVATION MEASURES IN THE PLAN.

(G) INCLUDE SPECIFIC ENERGY EFFICIENCY MEASURES FOR HOUSEHOLDS AT OR BELOW 150% OF THE FEDERAL POVERTY INCOME GUIDELINES. THE NUMBER OF MEASURES SHALL BE PROPORTIONATE TO THOSE HOUSEHOLDS' SHARE OF THE TOTAL ENERGY USAGE IN THIS COMMONWEALTH. THE ELECTRIC DISTRIBUTION COMPANY SHALL COORDINATE MEASURES UNDER THIS CLAUSE WITH OTHER PROGRAMS

ADMINISTERED BY THE COMMISSION OR ANOTHER FEDERAL OR STATE AGENCY. THE EXPENDITURES OF AN ELECTRIC DISTRIBUTION COMPANY UNDER THIS CLAUSE SHALL BE IN ADDITION TO EXPENDITURES MADE UNDER 52 PA. CODE CH. 58 (RELATING TO RESIDENTIAL LOW INCOME USAGE REDUCTION PROGRAMS).

(II) INCLUDE A PROPOSED COST RECOVERY TARIFF MECHANISM TO FUND THE ENERGY EFFICIENCY AND CONSERVATION MEASURES AND TO ENSURE RECOVERY OF THE PRUDENT AND REASONABLE COSTS OF THE PLAN AS APPROVED BY THE COMMISSION.

(I) A DEMONSTRATION THAT THE PLAN IS COST-EFFECTIVE USING A TOTAL RESOURCE COST TEST OR OTHER COST BENEFIT ANALYSIS APPROVED BY THE COMMISSION AND PROVIDES A DIVERSE CROSS SECTION OF ALTERNATIVES FOR CUSTOMERS OF ALL RATE CLASSES.

(J) REQUIRE AN ANNUAL INDEPENDENT EVALUATION OF THE PERFORMANCE OF THE COST EFFECTIVENESS OF THE PLAN AND A FULL REVIEW OF THE FIVE YEAR RESULTS OF THE PLAN AND, TO THE EXTENT PRACTICABLE, HOW THE PLAN WILL BE ADJUSTED ON A GOING FORWARD BASIS AS A RESULT OF THE EVALUATION.

(II) A NEW PLAN SHALL BE FILED WITH THE COMMISSION EVERY FIVE YEARS OR AS OTHERWISE REQUIRED BY THE COMMISSION. THE PLAN SHALL SET FORTH THE MANNER IN WHICH THE COMPANY WILL MEET THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(III) NO MORE THAN 2% OF FUNDS AVAILABLE TO IMPLEMENT A PLAN UNDER THIS SUBSECTION SHALL BE ALLOCATED FOR EXPERIMENTAL EQUIPMENT OR DEVICES.

(2) THE COMMISSION SHALL DIRECT AN ELECTRIC DISTRIBUTION COMPANY TO MODIFY OR TERMINATE ANY PART OF A PLAN APPROVED UNDER THIS SECTION IF, AFTER AN ADEQUATE PERIOD FOR IMPLEMENTATION, THE COMMISSION DETERMINES THAT AN ENERGY EFFICIENCY OR CONSERVATION MEASURE INCLUDED IN THE PLAN IS NOT EFFECTIVE.

(3) IF PART OF A PLAN IS MODIFIED OR TERMINATED UNDER PARAGRAPH (2), THE ELECTRIC DISTRIBUTION COMPANY SHALL SUBMIT A REVISED PLAN DESCRIBING ACTIONS TO BE TAKEN TO OFFER SUBSTITUTE MEASURES OR TO INCREASE THE AVAILABILITY OF EXISTING MEASURES IN THE PLAN TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(C) REDUCTIONS IN CONSUMPTION.--EACH ELECTRIC DISTRIBUTION COMPANY SHALL REDUCE CONSUMPTION AS FOLLOWS:

(1) BY MAY 31, 2011, EACH ELECTRIC DISTRIBUTION COMPANY SHALL REDUCE ITS TOTAL ANNUAL WEATHER-NORMALIZED DELIVERIES TO RETAIL CUSTOMERS BY A MINIMUM OF 1%. THE 1% LOAD REDUCTION IN CONSUMPTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S EXPECTED LOAD AS FORECASTED BY THE COMMISSION FOR JUNE 1, 2007 THROUGH MAY 31, 2008, WITH PROVISIONS MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOADS THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE.

(2) BY MAY 31, 2013, EACH ELECTRIC DISTRIBUTION COMPANY SHALL REDUCE ITS TOTAL ANNUAL WEATHER-NORMALIZED DELIVERIES TO RETAIL CUSTOMERS BY A MINIMUM OF 2.5%. THE 2.5% LOAD REDUCTION IN CONSUMPTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S EXPECTED LOAD AS FORECASTED BY THE COMMISSION FOR JUNE 1, 2007, THROUGH MAY 31, 2008, WITH PROVISION MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOADS THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE.

(3) BY NOVEMBER 30, 2013, THE COMMISSION SHALL EVALUATE THE COSTS AND BENEFITS OF THE PROGRAM ESTABLISHED UNDER SUBSECTION (A) AND ENERGY EFFICIENCY AND CONSERVATION PLANS SUBMITTED TO THE PROGRAM. THE EVALUATION SHALL BE CONSISTENT WITH A TOTAL RESOURCE COST TEST OR A COST VERSUS BENEFIT MEASUREMENT DETERMINED BY THE COMMISSION. IF THE COMMISSION

~~DETERMINES THAT THE BENEFITS OF THE PROGRAM EXCEED THE COSTS, THE COMMISSION SHALL ADOPT ADDITIONAL INCREMENTAL REQUIRED REDUCTIONS IN CONSUMPTION FOR THE PERIOD ENDING MAY 31, 2018.~~

~~(4) AFTER MAY 31, 2018, THE COMMISSION SHALL CONTINUE TO EVALUATE THE COSTS AND BENEFITS OF THE PROGRAM ESTABLISHED UNDER SUBSECTION (A) AND ENERGY EFFICIENCY AND CONSERVATION PLANS APPROVED UNDER SUBSECTION (A). IF THE COMMISSION DETERMINES THAT THE BENEFITS OF THE PROGRAM EXCEED THE COSTS, THE COMMISSION MAY REQUIRE AND APPROVE ADDITIONAL PLANS TO ACHIEVE INCREMENTAL REQUIREMENTS FOR REDUCTION IN CONSUMPTION FOR ELECTRIC DISTRIBUTION COMPANIES. EACH PLAN SHALL BE FOR A TERM NOT TO EXCEED FIVE YEARS.~~

~~(D) PEAK DEMAND. EACH ELECTRIC DISTRIBUTION COMPANY SHALL IMPLEMENT ENERGY EFFICIENCY AND CONSERVATION MEASURES TO ACHIEVE THE FOLLOWING REDUCTIONS IN CONSUMPTION:~~

~~(1) BY MAY 31, 2013, EACH ENERGY DISTRIBUTION COMPANY SHALL REDUCE ITS WEATHER NORMALIZED DELIVERIES TO RETAIL CUSTOMERS BY A MINIMUM OF 4% IN THE 100 HOURS OF HIGHEST DEMAND. THE REDUCTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S PEAK DEMAND IN THE 100 HOURS OF GREATEST DEMAND FOR JUNE 1, 2007, THROUGH MAY 31, 2008.~~

~~(2) BY NOVEMBER 30, 2013, THE COMMISSION SHALL COMPARE THE TOTAL COSTS OF ENERGY EFFICIENCY AND CONSERVATION PLANS IMPLEMENTED UNDER THIS SECTION TO THE TOTAL SAVINGS IN ENERGY AND CAPACITY COSTS TO RETAIL CUSTOMERS IN THIS COMMONWEALTH. IF THE COMMISSION DETERMINES THAT THE BENEFITS OF THE MEASURES EXCEED THE COSTS, THE COMMISSION SHALL SET ADDITIONAL INCREMENTAL REQUIREMENTS FOR REDUCTION IN PEAK DEMAND FOR THE 100 HOURS OF GREATEST DEMAND OR AN ALTERNATIVE REDUCTION APPROVED BY THE COMMISSION. REDUCTIONS IN**

~~CONSUMPTION SHALL BE MEASURED FROM THE ELECTRIC DISTRIBUTION COMPANY'S PEAK DEMAND FOR THE PERIOD FROM JUNE 1, 2011, THROUGH MAY 31, 2012. THE REDUCTIONS IN CONSUMPTION REQUIRED BY THE COMMISSION SHALL BE ACCOMPLISHED NO LATER THAN MAY 31, 2017.~~

~~(E) COMMISSION APPROVAL. THE COMMISSION SHALL APPROVE OR DISAPPROVE A PLAN FILED UNDER SUBSECTION (B) WITHIN 120 DAYS OF SUBMISSION. THE FOLLOWING SHALL APPLY TO AN ORDER DISAPPROVING A PLAN:~~

~~(1) THE COMMISSION SHALL DESCRIBE IN DETAIL THE REASONS FOR THE DISAPPROVAL.~~

~~(2) THE ELECTRIC DISTRIBUTION COMPANY SHALL HAVE 60 DAYS TO FILE A REVISED PLAN TO ADDRESS THE DEFICIENCIES IDENTIFIED BY THE COMMISSION.~~

~~(F) PENALTIES.--~~

~~(1) THE FOLLOWING SHALL APPLY FOR FAILURE TO SUBMIT A PLAN:~~

~~(I) AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO FILE A PLAN UNDER SUBSECTION (D) SHALL BE SUBJECT TO A CIVIL PENALTY OF $100,000 PER DAY UNTIL THE PLAN IS FILED.~~

~~(II) AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO FILE A REVISED PLAN UNDER SUBSECTION (E)(2) SHALL BE SUBJECT TO A CIVIL PENALTY OF $100,000 PER DAY UNTIL THE PLAN IS FILED.~~

~~(III) PENALTIES COLLECTED UNDER THIS PARAGRAPH SHALL BE DEPOSITED IN THE LOW INCOME ELECTRIC CUSTOMER ASSISTANCE PROGRAM OF THE ENERGY DISTRIBUTION COMPANY FOR THE RESPECTIVE SERVICE TERRITORY.~~

~~(2) THE FOLLOWING SHALL APPLY TO AN ELECTRIC**

~~DISTRIBUTION COMPANY THAT FAILS TO ACHIEVE THE REDUCTIONS IN CONSUMPTION REQUIRED UNDER SUBSECTION (C) OR (D):~~

~~(I) THE ELECTRIC DISTRIBUTION COMPANY SHALL BE SUBJECT TO A CIVIL PENALTY OF UP TO $5,000,000 FOR FAILURE TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D). ANY PENALTY PAID BY AN ELECTRIC DISTRIBUTION COMPANY UNDER THIS SUBPARAGRAPH SHALL NOT BE RECOVERABLE FROM RATEPAYERS.~~

(II) IF AN ELECTRIC DISTRIBUTION COMPANY FAILS TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D) BY 2013, RESPONSIBILITY TO ACHIEVE THE REDUCTIONS IN CONSUMPTION SHALL BE TRANSFERRED TO THE COMMISSION. THE COMMISSION SHALL DO ALL OF THE FOLLOWING:

(A) IMPLEMENT A PLAN TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D).

(B) CONTRACT WITH THIRD PARTY ENTITIES AS NECESSARY TO IMPLEMENT ANY PORTION OF THE PLAN.

(III) THE PROVISIONS OF SUBPARAGRAPH (II) SHALL APPLY IN EACH SUBSEQUENT FIVE YEAR PERIOD IF THE ELECTRIC DISTRIBUTION COMPANY FAILS TO ACHIEVE THE REDUCTION STANDARDS UNDER SUBSECTION (C) OR (D).

(G) LIMITATION ON COSTS. THE TOTAL COST OF ANY PLAN REQUIRED UNDER THIS SECTION SHALL NOT EXCEED 2% OF THE ELECTRIC DISTRIBUTION COMPANY'S TOTAL ANNUAL REVENUE AS OF DECEMBER 31, 2006. NO MORE THAN 1% OF THE 2% OF THE COMPANY'S TOTAL ANNUAL REVENUE MAY BE USED FOR THE ADMINISTRATIVE COSTS OF THE ELECTRIC DISTRIBUTION COMPANY. THE LIMITATION UNDER THIS PARAGRAPH SHALL NOT INCLUDE THE COST OF LOW-INCOME USAGE REDUCTION PROGRAMS ESTABLISHED UNDER 52 PA. CODE CH. 58 (RELATING TO RESIDENTIAL

LOW INCOME USAGE REDUCTION PROGRAMS).

(H) REPORT.--THE FOLLOWING SHALL APPLY:

(1) EACH ELECTRIC DISTRIBUTION COMPANY SHALL SUBMIT AN ANNUAL REPORT TO THE COMMISSION RELATING TO THE RESULTS OF THE ENERGY EFFICIENCY AND CONSERVATION PLAN WITHIN THE ELECTRIC DISTRIBUTION SERVICE TERRITORY. THE REPORT SHALL INCLUDE ALL OF THE FOLLOWING:

(I) DOCUMENTATION OF PROGRAM EXPENDITURES.

(II) MEASUREMENT AND VERIFICATION OF ENERGY SAVINGS UNDER THE PLAN.

(III) EVALUATION OF THE COST EFFECTIVENESS OF EXPENDITURES.

(IV) ANY OTHER INFORMATION REQUIRED BY THE COMMISSION.

(2) BEGINNING FIVE YEARS FOLLOWING THE EFFECTIVE DATE OF THIS SECTION AND ANNUALLY THEREAFTER, THE COMMISSION SHALL SUBMIT A REPORT TO THE CONSUMER PROTECTION AND PROFESSIONAL LICENSURE COMMITTEE OF THE SENATE AND THE CONSUMER AFFAIRS COMMITTEE OF THE HOUSE OF REPRESENTATIVES.

(I) EXISTING FUNDING SOURCES.--EACH ELECTRIC DISTRIBUTION COMPANY SHALL PROVIDE A LIST OF ALL ELIGIBLE FEDERAL AND STATE FUNDING PROGRAMS.

(J) RECOVERY.--IN NO CASE SHALL DECREASED REVENUES OF AN ELECTRIC DISTRIBUTION COMPANY DUE TO REDUCED ENERGY CONSUMPTION OR CHANGES IN ENERGY DEMAND BE CONSIDERED A RECOVERABLE COST.

(K) APPLICABILITY.--THIS SECTION SHALL NOT APPLY TO AN ELECTRIC DISTRIBUTION COMPANY WITH FEWER THAN 100,000 CUSTOMERS.

(L) DEFINITIONS. AS USED IN THIS SECTION, THE FOLLOWING WORDS AND PHRASES SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SUBSECTION:

"ELECTRIC DISTRIBUTION COMPANY TOTAL ANNUAL REVENUE." AMOUNTS PAID TO THE ELECTRIC DISTRIBUTION COMPANY FOR GENERATION, TRANSMISSION, DISTRIBUTION AND SURCHARGES BY RETAIL CUSTOMERS.

"ENERGY EFFICIENCY AND CONSERVATION MEASURES."

(1) TECHNOLOGIES, MANAGEMENT PRACTICES OR OTHER MEASURES EMPLOYED BY RETAIL CUSTOMERS THAT REDUCE ELECTRICITY CONSUMPTION OR DEMAND IF ALL OF THE FOLLOWING APPLY:

(I) THE TECHNOLOGY, PRACTICE OR OTHER MEASURE IS INSTALLED ON OR AFTER THE EFFECTIVE DATE OF THIS SECTION AT THE LOCATION OF A RETAIL CUSTOMER.

(II) THE TECHNOLOGY, PRACTICE OR OTHER MEASURE REDUCES CONSUMPTION OF ENERGY BY THE RETAIL CUSTOMER.

(III) THE COST OF THE ACQUISITION OR INSTALLATION OF THE MEASURE IS DIRECTLY INCURRED IN WHOLE OR IN PART BY THE ELECTRIC DISTRIBUTION COMPANY.

(2) ENERGY EFFICIENCY AND CONSERVATION MEASURES SHALL INCLUDE SOLAR OR SOLAR PHOTOVOLTAIC PANELS, ENERGY EFFICIENT WINDOWS AND DOORS, ENERGY EFFICIENT LIGHTING, INCLUDING EXIT SIGN RETROFIT, HIGH BAY FLUORESCENT RETROFIT AND PEDESTRIAN AND TRAFFIC SIGNAL CONVERSION, GEOTHERMAL HEATING, INSULATION, AIR SEALING, REFLECTIVE ROOF COATINGS, ENERGY EFFICIENT HEATING AND COOLING EQUIPMENT OR SYSTEMS AND ENERGY EFFICIENT APPLIANCES AND OTHER TECHNOLOGIES, PRACTICES OR MEASURES APPROVED BY THE COMMISSION.

"PEAK DEMAND." THE HIGHEST ELECTRICAL REQUIREMENT OCCURRING DURING A SPECIFIED PERIOD. FOR AN ELECTRIC DISTRIBUTION COMPANY, THE TERM SHALL MEAN THE SUM OF THE METERED CONSUMPTION FOR ALL RETAIL CUSTOMERS OVER THAT PERIOD.

"QUALITY ASSURANCE." ALL OF THE FOLLOWING:

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(1) THE AUDITING OF BUILDINGS, EQUIPMENT AND PROCESSES TO DETERMINE THE COST EFFECTIVENESS OF ENERGY EFFICIENCY AND CONSERVATION MEASURES USING NATIONALLY RECOGNIZED TOOLS AND CERTIFICATION PROGRAMS.

(2) INDEPENDENT INSPECTION OF COMPLETED ENERGY EFFICIENCY AND CONSERVATION MEASURES COMPLETED BY THIRD PARTY ENTITIES TO EVALUATE THE QUALITY OF THE COMPLETED MEASURE.

"REAL TIME PRICE." A RATE THAT DIRECTLY REFLECTS THE DIFFERENT COST OF ENERGY DURING EACH HOUR.

"THIRD PARTY ENTITY." AN ENTITY WITH NO DIRECT OR INDIRECT OWNERSHIP, PARTNERSHIP OR OTHER AFFILIATED INTEREST WITH AN ELECTRIC DISTRIBUTION COMPANY.

"TIME OF USE RATE." A RATE THAT REFLECTS THE COSTS OF SERVING CUSTOMERS DURING DIFFERENT TIME PERIODS, INCLUDING OFF-PEAK AND ON PEAK PERIODS, BUT NOT AS FREQUENTLY AS EACH HOUR.

"TOTAL RESOURCE COST TEST." A STANDARD TEST THAT IS MET IF, OVER THE EFFECTIVE LIFE OF EACH PLAN NOT TO EXCEED FIVE YEARS, THE AVOIDED MONETARY COSTS OF SUPPLYING ELECTRICITY ARE GREATER THAN THE MONETARY COSTS OF ENERGY EFFICIENCY MEASURES AND CONSERVATION OF CONSUMPTION.

SECTION 3. SECTION 2807(E) OF TITLE 66 IS AMENDED AND THE SECTION IS AMENDED BY ADDING SUBSECTIONS TO READ:

§ 2807. DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.

* * *

(E) OBLIGATION TO SERVE. [AN ELECTRIC DISTRIBUTION COMPANY'S] A DEFAULT SERVICE PROVIDER'S OBLIGATION TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE FOLLOWING [IMPLEMENTATION OF RESTRUCTURING AND THE CHOICE OF ALTERNATIVE GENERATION BY A CUSTOMER] THE EXPIRATION OF A GENERATION RATE CAP SPECIFIED UNDER SECTION 2804(4) (RELATING TO STANDARDS FOR RESTRUCTURING

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OF ELECTRIC INDUSTRY) OR A RESTRUCTURING PLAN UNDER SECTION 2806(F) (RELATING TO IMPLEMENTATION, PILOT PROGRAMS AND PERFORMANCE BASED RATES) IS REVISED AS FOLLOWS:

(1) WHILE AN ELECTRIC DISTRIBUTION COMPANY COLLECTS EITHER A COMPETITIVE TRANSITION CHARGE OR AN INTANGIBLE TRANSITION CHARGE OR UNTIL 100% OF ITS CUSTOMERS HAVE CHOICE, WHICHEVER IS LONGER, THE ELECTRIC DISTRIBUTION COMPANY SHALL CONTINUE TO HAVE THE FULL OBLIGATION TO SERVE, INCLUDING THE CONNECTION OF CUSTOMERS, THE DELIVERY OF ELECTRIC ENERGY AND THE PRODUCTION OR ACQUISITION OF ELECTRIC ENERGY FOR CUSTOMERS.

[(2) AT THE END OF THE TRANSITION PERIOD, THE COMMISSION SHALL PROMULGATE REGULATIONS TO DEFINE THE ELECTRIC DISTRIBUTION COMPANY'S OBLIGATION TO CONNECT AND DELIVER AND ACQUIRE ELECTRICITY UNDER PARAGRAPH (3) THAT WILL EXIST AT THE END OF THE PHASE IN PERIOD.

(3) IF A CUSTOMER CONTRACTS FOR ELECTRIC ENERGY AND IT IS NOT DELIVERED OR IF A CUSTOMER DOES NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER, THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION APPROVED ALTERNATIVE SUPPLIER SHALL ACQUIRE ELECTRIC ENERGY AT PREVAILING MARKET PRICES TO SERVE THAT CUSTOMER AND SHALL RECOVER FULLY ALL REASONABLE COSTS.]

(3.1) (I) FOLLOWING THE EXPIRATION OF AN ELECTRIC

DISTRIBUTION COMPANY'S OBLIGATION TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE TO RETAIL CUSTOMERS AT CAPPED RATES, IF A CUSTOMER CONTRACTS FOR ELECTRIC GENERATION SUPPLY SERVICE AND THE CHOSEN ELECTRIC GENERATION SUPPLIER DOES NOT PROVIDE THE SERVICE OR IF A CUSTOMER DOES NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION

SUPPLIER, THE DEFAULT SERVICE PROVIDER SHALL PROVIDE ELECTRIC GENERATION SUPPLY SERVICE TO THAT CUSTOMER PURSUANT TO A COMMISSION APPROVED COMPETITIVE PROCUREMENT PLAN. THE ELECTRIC POWER ACQUIRED SHALL BE PROCURED THROUGH COMPETITIVE PROCUREMENT PROCESSES AND SHALL INCLUDE ONE OR MORE OF THE FOLLOWING:

(A) AUCTIONS.

(B) REQUESTS FOR PROPOSAL.

(C) BILATERAL AGREEMENTS ENTERED INTO AT THE SOLE DISCRETION OF THE DEFAULT SERVICE PROVIDER WHICH SHALL BE AT PRICES WHICH ARE:

(I) NO GREATER THAN THE COST OF OBTAINING GENERATION UNDER COMPARABLE TERMS IN THE WHOLESALE MARKET, AS DETERMINED BY THE COMMISSION AT THE TIME OF EXECUTION OF THE CONTRACT; OR

(II) CONSISTENT WITH A COMMISSION-APPROVED COMPETITION PROCUREMENT PROCESS. ANY AGREEMENT BETWEEN AFFILIATED PARTIES SHALL BE SUBJECT TO REVIEW AND APPROVAL OF THE PENNSYLVANIA PUBLIC UTILITY COMMISSION UNDER CHAPTER 21 (RELATING TO RELATIONS WITH AFFILIATED INTERESTS). IN NO CASE SHALL THE COST OF OBTAINING GENERATION FROM ANY AFFILIATED INTEREST BE GREATER THAN THE COST OF OBTAINING GENERATION UNDER COMPARABLE TERMS IN THE WHOLESALE MARKET AT THE TIME OF EXECUTION OF THE CONTRACT.

(II) THE PROVISIONS OF THIS PARAGRAPH SHALL APPLY TO ANY TYPE OF FUEL PURCHASED BY A DEFAULT SERVICE PROVIDER TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE, INCLUDING FUEL REQUIRED TO BE PURCHASED UNDER THE ACT OF NOVEMBER

30, 2004 (P.L.1672, NO.213), KNOWN AS THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT.

(3.2) THE ELECTRIC POWER PROCURED PURSUANT TO PARAGRAPH (3.1) SHALL INCLUDE A PRUDENT MIX OF THE FOLLOWING:

(I) SPOT MARKET PURCHASES.

(II) SHORT-TERM CONTRACTS.

(III) LONG-TERM PURCHASE CONTRACTS, ENTERED INTO AS A RESULT OF AN AUCTION, REQUEST FOR PROPOSAL OR BILATERAL CONTRACT THAT IS FREE OF UNDUE INFLUENCE, DURESS OR FAVORITISM, OF NOT LESS THAN THREE AND NOT MORE THAN 20 YEARS, UNLESS THE COMMISSION DETERMINES A LONGER TERM IS NECESSARY FOR THE RELIABILITY IN THE ACQUISITION OF GENERATION AND IT IS IN THE BEST INTEREST OF CONSUMERS TO EXTEND THE TERM OF THE CONTRACT BEYOND 20 YEARS. THE DEFAULT SERVICE PROVIDER SHALL HAVE SOLE DISCRETION TO DETERMINE THE SOURCE, FUEL TYPE AND LENGTH OF CONTRACT.

(3.3) THE PRUDENT MIX OF CONTRACTS ENTERED INTO PURSUANT TO PARAGRAPH (3.2) SHALL BE DESIGNED TO ENSURE:

(I) ADEQUATE AND RELIABLE SERVICE.

(II) THE LEAST COST TO CUSTOMERS OVER TIME.

(III) COMPLIANCE WITH THE REQUIREMENTS OF PARAGRAPH (3.1).

(3.4) THE DEFAULT SERVICE PROVIDER SHALL FILE A PLAN FOR COMPETITIVE PROCUREMENT WITH THE COMMISSION AND OBTAIN COMMISSION APPROVAL OF THE PLAN CONSIDERING THE STANDARDS IN PARAGRAPHS (3.1), (3.2) AND (3.3) BEFORE THE COMPETITIVE PROCESS IS IMPLEMENTED. THE COMMISSION SHALL HOLD HEARINGS AS NECESSARY ON THE PROPOSED PLAN. IF THE COMMISSION FAILS TO ISSUE A FINAL ORDER ON THE PLAN WITHIN NINE MONTHS OF THE DATE THAT THE PLAN IS FILED, THE PLAN SHALL BE DEEMED TO BE

~~APPROVED AND THE DEFAULT SERVICE PROVIDER MAY IMPLEMENT THE PLAN AS FILED. COSTS INCURRED THROUGH AN APPROVED COMPETITIVE PROCUREMENT PLAN SHALL BE DEEMED TO BE THE LEAST COST OVER TIME AS REQUIRED UNDER PARAGRAPH (3.3).~~

~~(3.5) AT THE TIME THE COMMISSION EVALUATES THE PLAN AND PRIOR TO APPROVAL, IN DETERMINING IF THE DEFAULT ELECTRIC SERVICE PROVIDER'S PLAN OBTAINS GENERATION SUPPLY AT THE LEAST COST, THE COMMISSION SHALL CONSIDER THE DEFAULT SERVICE PROVIDER'S OBLIGATION TO PROVIDE ADEQUATE AND RELIABLE SERVICE TO THE CUSTOMERS AND THAT THE DEFAULT SERVICE PROVIDER HAS OBTAINED A PRUDENT MIX OF CONTRACTS TO OBTAIN LEAST COST ON LONG TERM, SHORT TERM AND SPOT MARKET BASIS AND SHALL MAKE SPECIFIC FINDINGS WHICH SHALL INCLUDE THE FOLLOWING:~~

~~(I) THE DEFAULT SERVICE PROVIDER'S PLAN INCLUDES PRUDENT STEPS NECESSARY TO NEGOTIATE FAVORABLE GENERATION SUPPLY CONTRACTS.~~

~~(II) THE DEFAULT SERVICE PROVIDER'S PLAN INCLUDES PRUDENT STEPS NECESSARY TO OBTAIN LEAST COST GENERATION SUPPLY CONTRACTS ON A LONG TERM, SHORT TERM AND SPOT MARKET BASIS.~~

~~(III) NEITHER THE DEFAULT SERVICE PROVIDER NOR ITS AFFILIATED INTEREST HAS WITHHELD OR ASKED TO WITHHOLD FROM THE MARKET ANY GENERATION SUPPLY WHICH SHOULD HAVE BEEN UTILIZED AS PART OF THE LEAST COST PROCUREMENT POLICY.~~

~~(3.6) NOTWITHSTANDING SECTIONS 508 (RELATING TO POWER OF COMMISSION TO VARY, REFORM AND REVISE CONTRACTS) AND 2102 (RELATING TO APPROVAL OF CONTRACTS WITH AFFILIATED INTERESTS), THE COMMISSION SHALL NOT MODIFY CONTRACTS OR~~

~~DISALLOW COSTS ASSOCIATED WITH AN APPROVED PROCUREMENT PROCESS WHEN IT HAS REVIEWED AND APPROVED THE RESULTS OF THE PROCUREMENT.~~

~~(3.7) NOTWITHSTANDING ANY OTHER PROVISION OF THIS TITLE TO THE CONTRARY, THE COMMISSION MAY MODIFY CONTRACTS OR DISALLOW COSTS WHEN THE PARTY SEEKING RECOVERY OF THE COSTS IS AT FAULT ASSOCIATED WITH CONTRACTS ENTERED INTO PURSUANT TO A COMMISSION APPROVED PROCUREMENT PLAN IF THE COMMISSION DETERMINES AFTER A HEARING THAT:~~

~~(I) THE CONTRACT HAS NOT BEEN IMPLEMENTED OR APPROVED OR DOES NOT COMPLY WITH THE COMMISSION APPROVED PROCUREMENT PLAN; OR~~

~~(II) THERE HAS BEEN FRAUD, COLLUSION OR MARKET MANIPULATION WITH REGARD TO THESE CONTRACTS.~~

~~(3.8) THE DEFAULT SERVICE PROVIDER SHALL HAVE THE RIGHT TO RECOVER ON A FULL AND CURRENT BASIS, PURSUANT TO A RECONCILABLE AUTOMATIC ADJUSTMENT CLAUSE UNDER SECTION 1307 (RELATING TO SLIDING SCALE OF RATES; ADJUSTMENTS), ALL COSTS INCURRED UNDER THIS SECTION AND A COMMISSION APPROVED COMPETITIVE PROCUREMENT PLAN.~~

~~(4) IF A CUSTOMER THAT CHOOSES AN ALTERNATIVE SUPPLIER AND SUBSEQUENTLY DESIRES TO RETURN TO THE LOCAL DISTRIBUTION COMPANY FOR GENERATION SERVICE, THE LOCAL DISTRIBUTION COMPANY SHALL TREAT THAT CUSTOMER EXACTLY AS IT WOULD ANY NEW APPLICANT FOR ENERGY SERVICE.~~

~~(5) (I) NOTWITHSTANDING PARAGRAPH [(3)] (3.1), THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION APPROVED ALTERNATIVE SUPPLIER MAY, IN ITS SOLE DISCRETION, OFFER LARGE CUSTOMERS WITH A PEAK DEMAND OF 15 MEGAWATTS OR GREATER AT ONE METER AT A LOCATION IN ITS SERVICE~~

~~TERRITORY ANY NEGOTIATED RATE FOR SERVICE AT ALL OF THE CUSTOMERS' LOCATIONS WITHIN THE SERVICE TERRITORY FOR ANY DURATION AGREED UPON BY THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION APPROVED ALTERNATIVE SUPPLIER AND THE LARGE CUSTOMER. THE COMMISSION SHALL PERMIT, BUT SHALL NOT REQUIRE, AN ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER TO PROVIDE SERVICE TO LARGE CUSTOMERS UNDER THIS PARAGRAPH. CONTRACT RATES ENTERED~~

~~INTO UNDER THIS PARAGRAPH SHALL BE SUBJECT TO REVIEW BY THE COMMISSION IN ORDER TO ENSURE THAT ALL COSTS RELATED TO THE RATES ARE BORNE BY THE PARTIES TO THE CONTRACT AND THAT NO COSTS RELATED TO THE RATES ARE BORNE BY OTHER CUSTOMERS OR CUSTOMER CLASSES. IF NO COSTS RELATED TO THE RATES ARE BORNE BY OTHER CUSTOMERS OR CUSTOMER CLASSES, THE COMMISSION SHALL APPROVE THE CONTRACT WITHIN 90 DAYS OF ITS FILING, OR IT SHALL BE DEEMED APPROVED BY OPERATION OF LAW UPON EXPIRATION OF THE 90 DAYS. INFORMATION SUBMITTED UNDER THIS PARAGRAPH SHALL BE SUBJECT TO THE COMMISSION'S PROCEDURES FOR THE FILING OF CONFIDENTIAL AND PROPRIETARY INFORMATION.~~

~~(II) FOR PURPOSES OF PROVIDING SERVICE UNDER THIS PARAGRAPH TO CUSTOMERS WITH A PEAK DEMAND OF 20 MEGAWATTS OR GREATER AT ONE METER AT A LOCATION WITHIN THAT DISTRIBUTION COMPANY'S SERVICE TERRITORY, AN ELECTRIC DISTRIBUTION COMPANY THAT HAS COMPLETED ITS RESTRUCTURING TRANSITION PERIOD AS OF THE EFFECTIVE DATE OF THIS PARAGRAPH MAY, IN ITS SOLE DISCRETION, ACQUIRE AN INTEREST IN A GENERATION FACILITY OR CONSTRUCT A GENERATION FACILITY SPECIFICALLY TO MEET THE ENERGY REQUIREMENTS OF THE CUSTOMERS, INCLUDING THE ELECTRIC~~

~~REQUIREMENTS OF THE CUSTOMERS' OTHER BILLING LOCATIONS WITHIN ITS SERVICE TERRITORY. THE ELECTRIC DISTRIBUTION COMPANY MUST COMMENCE CONSTRUCTION OF THE GENERATION FACILITY OR CONTRACT TO ACQUIRE THE GENERATION INTEREST WITHIN THREE YEARS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, EXCEPT THAT THE ELECTRIC DISTRIBUTION COMPANY MAY ADD TO THE GENERATION FACILITIES IT COMMENCED CONSTRUCTION OR CONTRACTED TO ACQUIRE AFTER THIS THREE-YEAR PERIOD TO SERVE ADDITIONAL LOAD OF CUSTOMERS FOR WHOM IT COMMENCED CONSTRUCTION OR CONTRACTED TO ACQUIRE GENERATION WITHIN THREE YEARS. NOTHING IN THIS PARAGRAPH REQUIRES OR AUTHORIZES THE COMMISSION TO REQUIRE AN ELECTRIC DISTRIBUTION COMPANY TO COMMENCE CONSTRUCTION OR ACQUIRE AN INTEREST IN A GENERATION FACILITY. THE ELECTRIC DISTRIBUTION COMPANY'S INTEREST IN THE GENERATION FACILITY IT BUILT OR CONTRACTED TO ACQUIRE SHALL BE NO LARGER THAN NECESSARY TO MEET PEAK DEMAND OF CUSTOMERS SERVED UNDER THIS SUBPARAGRAPH. DURING TIMES WHEN THE CUSTOMER'S DEMAND IS LESS THAN THE ELECTRIC DISTRIBUTION COMPANY'S GENERATION INTEREST, THE ELECTRIC DISTRIBUTION COMPANY MAY SELL EXCESS POWER ON THE WHOLESALE MARKET. AT NO TIME SHALL THE COSTS ASSOCIATED WITH THE GENERATING FACILITY INTERESTS BE INCLUDED IN RATE BASE OR OTHERWISE REFLECTED IN RATES. THE GENERATION FACILITY INTERESTS SHALL NOT BE COMMISSION-REGULATED ASSETS.~~

~~(6) A DEFAULT SERVICE PLAN APPROVED BY THE COMMISSION PRIOR TO THE EFFECTIVE DATE OF THIS SECTION SHALL REMAIN IN EFFECT THROUGH ITS APPROVED TERM. AT ITS SOLE DISCRETION, THE DEFAULT SERVICE PROVIDER MAY PROPOSE AMENDMENTS TO ITS~~

~~APPROVED PLAN THAT ARE CONSISTENT WITH THIS SECTION, AND THE COMMISSION SHALL ISSUE A DECISION WHETHER TO APPROVE OR DISAPPROVE THE PROPOSED AMENDMENTS WITHIN NINE MONTHS OF THE DATE THAT THE AMENDMENTS ARE FILED. IF THE COMMISSION FAILS TO ISSUE A FINAL ORDER WITHIN NINE MONTHS, THE AMENDMENTS SHALL BE DEEMED TO BE APPROVED AND THE DEFAULT SERVICE PROVIDER MAY IMPLEMENT THE AMENDMENTS AS FILED.~~

~~(7) THE DEFAULT SERVICE PROVIDER SHALL OFFER RESIDENTIAL AND SMALL BUSINESS CUSTOMERS A GENERATION SUPPLY SERVICE RATE THAT SHALL CHANGE NO MORE FREQUENTLY THAN ON A QUARTERLY BASIS. ALL DEFAULT SERVICE RATES SHALL BE REVIEWED BY THE COMMISSION TO ENSURE THAT THE COSTS OF PROVIDING SERVICE TO EACH CUSTOMER CLASS ARE NOT SUBSIDIZED BY ANY OTHER CLASS.~~

~~(F) SMART METER TECHNOLOGY AND TIME OF USE RATES.--~~

~~(1) WITHIN NINE MONTHS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, ELECTRIC DISTRIBUTION COMPANIES SHALL FILE A SMART~~

~~METER TECHNOLOGY PROCUREMENT AND INSTALLATION PLAN WITH THE COMMISSION FOR APPROVAL. THE PLAN SHALL DESCRIBE THE SMART METER TECHNOLOGIES THE ELECTRIC DISTRIBUTION COMPANY PROPOSES TO INSTALL IN ACCORDANCE WITH PARAGRAPH (2).~~

~~(2) ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS:~~

~~(I) UPON REQUEST TO A CUSTOMER THAT AGREES TO PAY THE COST OF THE SMART METER.~~

~~(II) IN THE CONSTRUCTION OF A NEW RESIDENCE OR NEW BUILDING TO BE USED BY A COMMERCIAL CUSTOMER.~~

~~(III) IN ACCORDANCE WITH A SCHEDULE OF REPLACEMENT OF FULL DEPRECIATION OF EXISTING METERS.~~

~~(3) ELECTRIC DISTRIBUTION COMPANIES SHALL, WITH CUSTOMER CONSENT, MAKE AVAILABLE ELECTRONIC ACCESS TO CUSTOMER METER~~

~~DATA TO THIRD PARTIES, INCLUDING ELECTRIC GENERATION SUPPLIERS AND PROVIDERS OF CONSERVATION AND LOAN MANAGEMENT SERVICES.~~

~~(4) AN ELECTRIC DISTRIBUTION COMPANY SHALL NOT BE PERMITTED TO RECOVER THE COSTS, AS DETERMINED BY THE COMMISSION, OF PROVIDING SMART METER TECHNOLOGY UNDER PARAGRAPH (2).~~

~~(5) IN NO EVENT SHALL LOST OR DECREASED REVENUES BY AN ELECTRIC DISTRIBUTION COMPANY DUE TO REDUCED ELECTRICITY CONSUMPTION OR SHIFTING ENERGY DEMAND BE CONSIDERED A COST OF SMART METER TECHNOLOGY.~~

~~(6) BY JANUARY 1, 2010, OR AT THE END OF THE APPLICABLE GENERATION RATE CAP PERIOD, WHICHEVER IS LATER, A DEFAULT SERVICE PROVIDER SHALL SUBMIT TO THE COMMISSION ONE OR MORE PROPOSED TIME OF USE RATES AND REAL TIME PRICE PLANS. THE COMMISSION SHALL APPROVE OR MODIFY THE TIME OF USE RATES AND REAL TIME PRICE PLAN WITHIN SIX MONTHS OF SUBMITTAL. THE DEFAULT SERVICE PROVIDER SHALL OFFER THE RATES AND REAL TIME PRICE PLAN TO ALL RESIDENTIAL AND COMMERCIAL CUSTOMERS THAT HAVE BEEN PROVIDED WITH SMART METER TECHNOLOGY WITHIN 60 DAYS OF INSTALLATION OF THE SMART METER TECHNOLOGY OR COMMISSION APPROVAL OF THE TIME OF USE RATES AND REAL TIME PRICE PLAN, WHICHEVER IS LATER. RESIDENTIAL OR COMMERCIAL CUSTOMERS MAY ELECT TO PARTICIPATE IN TIME OF USE RATES OR REAL TIME PRICING. THE DEFAULT SERVICE PROVIDER SHALL SUBMIT AN ANNUAL REPORT TO THE COMMISSION ON THE PARTICIPATION IN THE TIME OF USE AND REAL TIME PRICE PROGRAMS AND THE EFFICACY OF THE PROGRAMS IN AFFECTING ENERGY DEMAND AND CONSUMPTION AND THE EFFECT ON WHOLESALE MARKET PRICES.~~

~~(7) THE PROVISIONS OF THIS SUBSECTION SHALL NOT APPLY TO~~

~~AN ELECTRIC DISTRIBUTION COMPANY WITH 100,000 OR FEWER CUSTOMERS.~~

~~(G) DEFINITION. AS USED IN THIS SECTION, THE TERM "SMART METER TECHNOLOGY" MEANS TECHNOLOGY, INCLUDING METERING TECHNOLOGY AND NETWORK COMMUNICATIONS TECHNOLOGY CAPABLE OF BIDIRECTIONAL COMMUNICATION, THAT RECORDS ELECTRICITY USAGE ON AT LEAST AN HOURLY BASIS, INCLUDING RELATED ELECTRIC DISTRIBUTION SYSTEM UPGRADES TO ENABLE THE TECHNOLOGY. THE TECHNOLOGY SHALL PROVIDE CUSTOMERS WITH DIRECT ACCESS TO AND USE OF PRICE AND CONSUMPTION INFORMATION. THE TECHNOLOGY SHALL ALSO:~~

~~(1) DIRECTLY PROVIDE CUSTOMERS WITH INFORMATION ON THEIR HOURLY CONSUMPTION.~~

~~(2) ENABLE TIME OF USE RATES AND REAL TIME PRICE PROGRAMS.~~

~~(3) EFFECTIVELY SUPPORT THE AUTOMATIC CONTROL OF THE CUSTOMER'S ELECTRICITY CONSUMPTION BY ONE OR MORE OF THE FOLLOWING AS SELECTED BY THE CUSTOMER:~~

~~(I) THE CUSTOMER;~~

~~(II) THE CUSTOMER'S UTILITY; OR~~

~~(III) A THIRD PARTY ENGAGED BY THE CUSTOMER OR THE CUSTOMER'S UTILITY.~~

~~(4) PROVIDE A MEANS TO OBTAIN REAL TIME CONSUMPTION INFORMATION FROM A METER SUCH AS AN INSTALLED PORT OR OUTPUT FOR TRANSMITTING METER PULSE DATA EXTERNAL TO THE METER TO BE~~

~~USED BY THE CUSTOMER, THE ELECTRIC DISTRIBUTION COMPANY OR A THIRD PARTY ENGAGED BY THE CUSTOMER IN THE ELECTRIC DISTRIBUTION COMPANY.~~

~~SECTION 4. TITLE 66 IS AMENDED BY ADDING A SECTION TO READ:~~

~~§ 2813. PROCUREMENT OF POWER.~~

~~EXCEPT AS PROVIDED UNDER THE ACT OF NOVEMBER 30, 2004~~

~~(P.L.1672, NO.213), KNOWN AS THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT, THE COMMISSION MAY NOT ORDER A DEFAULT SERVICE PROVIDER TO PROCURE POWER FROM A SPECIFIC GENERATION SUPPLIER, FROM A SPECIFIC GENERATION FUEL TYPE OR FROM NEW GENERATION ONLY.~~

~~SECTION 5. THIS ACT SHALL TAKE EFFECT IN 60 DAYS.~~

SECTION 1. SECTION 305(A) OF TITLE 66 OF THE PENNSYLVANIA <--
CONSOLIDATED STATUTES IS AMENDED TO READ:

§ 305. DIRECTOR OF OPERATIONS, SECRETARY, EMPLOYEES AND CONSULTANTS.

(A) DIRECTOR OF OPERATIONS.--THE COMMISSION MAY APPOINT A DIRECTOR OF OPERATIONS WHO SHALL SERVE AT THE PLEASURE OF THE COMMISSION AND SHALL BE RESPONSIBLE FOR THE DAY-TO-DAY ADMINISTRATION AND OPERATION OF THE BUREAUS AND OFFICES OF THE COMMISSION, EXCEPT THAT THE DIRECTOR OF OPERATIONS SHALL HAVE RESPONSIBILITY FOR THE [OFFICE OF TRIAL STAFF] PROSECUTORIAL FUNCTION ONLY WITH REGARD TO ADMINISTRATIVE MATTERS.

* * *

SECTION 1.1. SECTION 306 OF TITLE 66 IS REPEALED:

[§ 306. OFFICE OF TRIAL STAFF.

(A) GENERAL RULE.--THE OFFICE OF TRIAL STAFF TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION IS HEREBY CREATED. THE DIRECTOR OF TRIAL STAFF, WHO SHALL BE THE CHIEF PROSECUTOR OF THE COMMISSION, SHALL BE APPOINTED BY THE COMMISSION AND HOLD OFFICE AT ITS PLEASURE. THE COMMISSION SHALL ASSIGN A PERMANENT STAFF OF SUCH LEGAL, TECHNICAL AND OTHER EMPLOYEES OF THE COMMISSION AS MAY BE REQUIRED FOR THE PROPER CONDUCT OF THE WORK OF THE OFFICE OF TRIAL STAFF. EMPLOYEES ASSIGNED TO THE OFFICE OF TRIAL STAFF SHALL BE UNDER THE SUPERVISION OF THE DIRECTOR OF TRIAL STAFF AND SHALL NOT BE ASSIGNED TO ANY DUTIES OTHER THAN

WITH THE OFFICE OF TRIAL STAFF, EXCEPT AS THE COMMISSION MAY ON A TEMPORARY CASE-BY-CASE BASIS PERMIT WHERE THE PERFORMANCE OF SUCH OTHER DUTIES WILL NOT REPRESENT, OR CREATE THE APPEARANCE OF, A CONFLICT OF INTEREST. THE COMMISSION MAY DESIGNATE EMPLOYEES OF THE OFFICE OF TRIAL STAFF TO SERVE AS DEPUTIES TO THE DIRECTOR OF TRIAL STAFF. THE DIRECTOR OF TRIAL STAFF MAY RECOMMEND PERSONS FOR CONSIDERATION BY THE COMMISSION AS EMPLOYEES UNDER HIS SUPERVISION. ATTORNEYS ASSIGNED TO THE OFFICE OF TRIAL STAFF MAY BE REMOVED BY THE COMMISSION ONLY FOR GOOD CAUSE. THE COMPENSATION OF THE DIRECTOR OF TRIAL STAFF AND THE EMPLOYEES UNDER HIS SUPERVISION SHALL BE FIXED BY THE COMMISSION. THE DIRECTOR OF TRIAL STAFF SHALL REPORT AND BE RESPONSIBLE DIRECTLY TO THE COMMISSION, PROVIDED THAT THE DIRECTOR OF TRIAL STAFF SHALL BE RESPONSIBLE TO THE COMMISSION THROUGH THE DIRECTOR OF OPERATIONS ONLY FOR PURPOSES OF ADMINISTRATIVE MATTERS.

(B) POWER AND DUTIES.--

(1) THE OFFICE OF TRIAL STAFF SHALL BE RESPONSIBLE FOR AND SHALL ASSIST IN THE DEVELOPMENT OF, CHALLENGE OF AND REPRESENTATION ON THE RECORD OF ALL MATTERS IN THE PUBLIC INTEREST IN ALL COMMISSION PROCEEDINGS EXCEPT THOSE INVOLVING TRANSPORTATION, SAFETY, EMINENT DOMAIN, SITING, SERVICE ISSUES HAVING NO IMPACT ON RATES AND ABILITY TO PAY, PROVIDED THAT THE DIRECTOR OF TRIAL STAFF MAY PETITION THE COMMISSION OR MAY BE DIRECTED BY THE COMMISSION TO INTERVENE TO PROTECT THE PUBLIC INTEREST IN ANY PROCEEDING INVOLVING TRANSPORTATION, SAFETY, EMINENT DOMAIN, SITING, SERVICE ISSUES HAVING NO IMPACT ON RATES AND ABILITY TO PAY. TO ASSIST IN CARRYING OUT HIS POWERS AND DUTIES UNDER THIS SECTION, THE DIRECTOR OF TRIAL STAFF SHALL SUPERVISE THE

ACTIVITIES OF THE OFFICE OF TRIAL STAFF IN ALL COMMISSION PROCEEDINGS IN WHICH HE PARTICIPATES. IF THE DIRECTOR OF TRIAL STAFF IS OF THE OPINION THAT THE INITIATION OF A PROCEEDING IS NECESSARY TO PROTECT THE PUBLIC INTEREST, HE SHALL REQUEST THAT THE COMMISSION INITIATE THE APPROPRIATE PROCEEDING. WHEN HE PARTICIPATES IN A COMMISSION PROCEEDING, IT SHALL BE THE DUTY AND RESPONSIBILITY OF THE DIRECTOR OF TRIAL STAFF TO PROSECUTE IN THAT PROCEEDING.

(2) IN ADDITION TO ANY OTHER RESPONSIBILITY CONVEYED UPON IT BY THE COMMISSION, THE OFFICE OF TRIAL STAFF SHALL SUBMIT A REPORT TO THE COMMISSION RECOMMENDING WHETHER THE COMMISSION SHOULD ENTER UPON A HEARING IN ORDER TO INVESTIGATE THE JUSTNESS AND REASONABLENESS OF A TARIFF FILED PURSUANT TO SECTION 1308 (RELATING TO VOLUNTARY CHANGES IN RATES), TO SUSPEND THE EFFECTIVENESS OF SUCH TARIFF, TO ALLOW SUCH TARIFF TO BE SUSPENDED BY OPERATION OF LAW OR TO ALLOW TEMPORARY RATES PURSUANT TO SECTION 1310 (RELATING TO TEMPORARY RATES). THE REPORT:

(I) SHALL RECOMMEND ONLY THE INITIAL ACTION WHICH THE COMMISSION SHOULD TAKE AND SHALL NOT CONTAIN AN OPINION AS TO THE PORTION OF A PROPOSED RATE INCREASE WHICH APPEARS TO BE JUST AND REASONABLE, UNLESS THE REPORT INCLUDES A FINDING THAT THE PROPOSED RATE INCREASE APPEARS TO BE JUST AND REASONABLE IN ITS ENTIRETY;

(II) SHALL BE RELEASED TO THE PUBLIC IF THE REPORT RECOMMENDS THAT NO HEARINGS NEED TO BE HELD REGARDING THE PROPOSED TARIFF OR THAT THE PROPOSED TARIFF SHOULD NOT BE SUSPENDED, AND MAY BE RELEASED TO THE PUBLIC IN OTHER CIRCUMSTANCES WHEN, IN THE OPINION OF THE COMMISSION, SUCH RELEASE WOULD BE IN THE PUBLIC INTEREST;

(III) SHALL BE CONSIDERED ONLY AS AN INDICATION OF THE OFFICE OF TRIAL STAFF'S OPINION REGARDING WHETHER THERE SHOULD BE A HEARING ON THE PROPOSED TARIFF OR WHETHER THE PROPOSED TARIFF SHOULD BE SUSPENDED; AND

(IV) SHALL NOT BE CONSIDERED AS EVIDENCE OF THE OFFICE OF TRIAL STAFF'S OPINION REGARDING THE JUSTNESS AND REASONABLENESS OF ANY PROPOSED TARIFF IN ANY SUBSEQUENT COMMISSION PROCEEDING.

(3) EXCEPT FOR THE DUTIES SET OUT IN PARAGRAPH (2), NEITHER THE DIRECTOR OF TRIAL STAFF NOR ANY EMPLOYEE WHOM THE DIRECTOR OF TRIAL STAFF SUPERVISES SHALL COMMUNICATE WITH THE COMMISSION, AN ADMINISTRATIVE LAW JUDGE OR ANY OTHER EMPLOYEE OF THE COMMISSION WHO IS DECIDING OR ADVISING IN THE DECISION IN AN ON-THE-RECORD PROCEEDING, WHETHER CONTESTED OR UNCONTESTED, AS DEFINED IN SECTION 332(C) (RELATING TO PROCEDURES IN GENERAL), EXCEPT THROUGH THE PRACTICE AND PROCEDURE AVAILABLE TO ALL PARTIES TO COMMISSION PROCEEDINGS.]

SECTION 1.2. SECTION 308(A)(2) AND (4), (B), (C), (E), (F) AND (G) OF TITLE 66 ARE AMENDED TO READ:

§ 308. BUREAUS AND OFFICES.

(A) ENUMERATION.--THERE SHALL BE ESTABLISHED WITHIN THE COMMISSION THE FOLLOWING BUREAUS AND FUNCTIONS:

* * *

[(2) BUREAU OF CONSERVATION, ECONOMICS AND ENERGY PLANNING.]

* * *

[(4) OFFICE OF SPECIAL ASSISTANTS.]

(B) LAW BUREAU.--THE LAW BUREAU SHALL BE A MULTIFUNCTION LEGAL STAFF, CONSISTING OF A PROSECUTORY FUNCTION, AN ADVISORY

FUNCTION, A REPRESENTATIONAL FUNCTION AND AN ENFORCEMENT FUNCTION. THE DIRECTOR OF THE LAW BUREAU SHALL BE THE CHIEF COUNSEL OF THE COMMISSION AND SHALL SERVE AT THE PLEASURE OF THE COMMISSION. THE COMMISSION MAY ALSO, FROM TIME TO TIME, APPOINT SUCH ASSISTANT COUNSEL TO THE COMMISSION AS MAY BE REQUIRED FOR THE PROPER CONDUCT OF THE WORK OF THE LAW BUREAU. ASSISTANT COUNSEL MAY BE REMOVED BY THE COMMISSION ONLY FOR GOOD CAUSE. THE LAW BUREAU SHALL ADVISE THE COMMISSION ON ANY AND ALL

MATTERS. NO COUNSEL SHALL IN THE SAME CASE OR A FACTUALLY RELATED CASE PERFORM DUTIES IN THE PROSECUTORY AND ADVISORY FUNCTIONS, IF SUCH PERFORMANCE WOULD REPRESENT A CONFLICT OF INTEREST. EXCEPT FOR LITIGATION REFERRED TO THE ATTORNEY GENERAL OR OTHER APPROPRIATE OUTSIDE COUNSEL, THE LAW BUREAU SOLELY SHALL BE RESPONSIBLE TO REPRESENT THE COMMISSION UPON APPEALS AND OTHER HEARINGS IN THE COURTS OF COMMON PLEAS AND IN THE COMMONWEALTH COURT, SUPREME COURT OR OTHER COURTS OF THIS COMMONWEALTH OR IN ANY FEDERAL COURT OR AGENCY AND IN ACTIONS INSTITUTED TO RECOVER PENALTIES AND TO ENFORCE REGULATIONS AND ORDERS OF THE COMMISSION. [NO MEMBER OF THE LAW BUREAU SHALL PARTICIPATE IN ANY PROSECUTORY FUNCTION IN ANY MATTER] IF NECESSARY TO PROTECT THE PUBLIC INTEREST, THE LAW BUREAU, PURSUANT TO ITS PROSECUTORIAL FUNCTION, MAY INITIATE AND PARTICIPATE IN PROCEEDINGS BEFORE THE COMMISSION UNLESS DIRECTED BY THE COMMISSION TO DO SO IN A PROCEEDING INVOLVING TRANSPORTATION, SAFETY, EMINENT DOMAIN, SITING, SERVICE ISSUES HAVING NO IMPACT ON RATES OR ABILITY TO PAY OR ASSIST THE OFFICE OF TRIAL STAFF IN CARRYING OUT THE DUTIES OF THE OFFICE OF TRIAL STAFF, NOR SHALL ANY MEMBER OF THE LAW BUREAU RECEIVE ASSISTANCE FROM THE OFFICE OF TRIAL STAFF IN THE PERFORMANCE OF HIS DUTIES. EXCEPT AS PROVIDED IN THIS SECTION, THE LAW BUREAU MAY RECEIVE

ASSISTANCE FROM ANY OTHER BUREAU OR OFFICE OF THE COMMISSION AS DETERMINED TO BE NECESSARY.

[(C) BUREAU OF CONSERVATION, ECONOMICS AND ENERGY PLANNING.--THE BUREAU OF CONSERVATION, ECONOMICS AND ENERGY PLANNING SHALL CONDUCT STUDIES AND RESEARCH ALL MATTERS WITHIN THE COMMISSION'S JURISDICTION AND ADVISE THE COMMISSION OF THE RESULTS THEREOF IN ORDER TO ENABLE THE COMMISSION TO PROVIDE PROSPECTIVE REGULATION IN THE BEST INTEREST OF ALL PARTIES CONCERNED. SUCH STUDIES AND RESEARCH SHALL INCLUDE LONG RANGE FORECASTING OF ENERGY NEEDS AND DEVELOPMENT; RESEARCH INTO THE USE OF NEW, EFFICIENT AND ECONOMIC METHODS OF ENERGY PRODUCTION; THE REVIEW OF THE EFFICIENCY OF THE PRESENT GENERATING SYSTEMS OPERATED WITHIN THIS COMMONWEALTH; AND THE DEVELOPMENT OF AN EFFECTIVE PROGRAM OF ENERGY CONSERVATION. THE COMMISSION SHALL REQUIRE ALL ELECTRIC AND GAS PUBLIC UTILITIES SUBJECT TO ITS JURISDICTION TO FILE WITH IT AN ANNUAL CONSERVATION REPORT WHICH SHOWS THE PLANS AND PROGRESS ACHIEVED ON PROGRAMS OF ENERGY CONSERVATION. THE COMMISSION SHALL, BY RULE, PRESCRIBE GUIDELINES FOR THE FORM AND MANNER OF SUCH ANNUAL CONSERVATION REPORT WHICH REPORT SHALL DESCRIBE THE CURRENT AND PROPOSED PROGRAMS OF EACH SUCH UTILITY DESIGNED TO EDUCATE AND ENCOURAGE ITS CUSTOMERS IN THE OPTIMUM, EFFECTIVE AND EFFICIENT USE BY THEM OF ELECTRIC AND GAS ENERGY. THE REPORT SHALL INCLUDE AN ACCOUNTING OF THE MONETARY AND PERSONNEL RESOURCES ACTUALLY OR PROPOSED TO BE EXPENDED OR DEVOTED TO AND THE ACTUAL OR ANTICIPATED RESULTS OF SUCH PROGRAMS. THE BUREAU SHALL REVIEW ALL PROPOSALS FOR ELECTRIC AND GAS PUBLIC UTILITY PLANT EXPANSION AND SHALL SUBMIT FOR CONSIDERATION OF THE COMMISSION ITS FINDINGS ON WHAT IMPACT, IF ANY, THE ELECTRIC AND GAS PUBLIC UTILITY PLANT EXPANSION WILL HAVE ON RATES CHARGED BY THE PUBLIC

UTILITY.]

* * *

[(E) OFFICE OF SPECIAL ASSISTANTS.--THE OFFICE OF SPECIAL ASSISTANTS SHALL BE A SUPPORT STAFF WHICH SHALL BE RESPONSIBLE TO ASSIST IN THE PREPARATION OF COMMISSION ORDERS AND SHALL PERFORM SUCH OTHER ADVISORY DUTIES AS MAY BE REQUIRED OF IT BY THE COMMISSION. NO MEMBER OF THE OFFICE OF SPECIAL ASSISTANTS SHALL PARTICIPATE IN ANY PROSECUTORY FUNCTION IN ANY MATTER BEFORE THE COMMISSION. NO MEMBER OF THE OFFICE OF SPECIAL ASSISTANTS SHALL ASSIST THE OFFICE OF TRIAL STAFF IN CARRYING OUT THE DUTIES OF THE OFFICE OF TRIAL STAFF, NOR SHALL ANY MEMBER OF THE OFFICE OF SPECIAL ASSISTANTS RECEIVE ASSISTANCE FROM THE OFFICE OF TRIAL STAFF IN THE PERFORMANCE OF HIS DUTIES. EXCEPT AS PROVIDED IN THIS SECTION, THE OFFICE OF SPECIAL ASSISTANTS MAY RECEIVE ASSISTANCE FROM, OR PROVIDE ASSISTANCE TO, ANY OTHER BUREAU OR OFFICE OF THE COMMISSION AS DETERMINED

TO BE NECESSARY.
(F) OTHER BUREAUS AND OFFICES.--THE COMMISSION SHALL ESTABLISH SUCH BUREAU OR BUREAUS TO PERFORM SUCH DUTIES AS THE COMMISSION MAY PRESCRIBE REGARDING ALL MATTERS RESPECTING RATES OF PUBLIC UTILITIES AND ALL MATTERS RESPECTING COMMON CARRIERS AND CONTRACT CARRIERS. THE ESTABLISHMENT OF THESE BUREAUS SHALL NOT BE CONSTRUED TO PROHIBIT THE COMMISSION FROM ESTABLISHING ANY ADDITIONAL BUREAUS WHICH THE COMMISSION FINDS NECESSARY TO PROTECT THE INTERESTS OF THE PEOPLE OF THIS COMMONWEALTH. THE BUREAUS MAY PERFORM SUCH OTHER DUTIES NOT INCONSISTENT WITH LAW AS THE COMMISSION MAY DIRECT.
(G) STAFF TESTIMONY.--MEMBERS OF THE STAFF OF THE COMMISSION, EXCEPT FOR THE OFFICE OF SPECIAL ASSISTANTS, SHALL APPEAR AND PRESENT TESTIMONY IN ANY PROCEEDING BEFORE THE

COMMISSION WHEN CALLED BY THE COMMISSION, THE CHIEF COUNSEL, THE DIRECTOR OF TRIAL STAFF OR ANY OF THE PARTIES TO THE PROCEEDING. IN ADDITION TO ANY CROSS-EXAMINATION BY THE OFFICE OF TRIAL STAFF AS PROVIDED IN SECTION 306 (RELATING TO OFFICE OF TRIAL STAFF) OR THE CHIEF COUNSEL, ANY MEMBER OF THE COMMISSION STAFF WHO PARTICIPATES IN THE ANALYSIS, REVIEW AND CONCLUSIONS IN ANY PROCEEDINGS BEFORE THE COMMISSION MAY, IN THE DISCRETION OF THE OFFICE OF TRIAL STAFF OR THE CHIEF COUNSEL AND WITH THE CONSENT OF THE PRESIDING OFFICER, CROSS-EXAMINE ANY WITNESS PRESENTED BY THE PARTIES TO THE PROCEEDING AT THE PUBLIC HEARING.]
SECTION 1.3. TITLE 66 IS AMENDED BY ADDING A SECTION TO READ:
§ 308.2. OTHER BUREAUS, OFFICES AND POSITIONS.
(A) ESTABLISHMENT OF OTHER BUREAUS, OFFICES AND POSITIONS.--IN ADDITION TO THE SPECIFIC BUREAUS ESTABLISHED IN THIS PART, THE COMMISSION MAY ESTABLISH OTHER BUREAUS, OFFICES AND POSITIONS TO PERFORM THE FOLLOWING FUNCTIONS:
(1) REVIEW AND PROVIDE ADVICE REGARDING APPLICATIONS, PETITIONS, TARIFF FILINGS AND OTHER MATTERS FILED WITH THE COMMISSION.
(2) PROVIDE ADVICE, REVIEW EXCEPTIONS AND PREPARE ORDERS REGARDING MATTERS TO BE ADJUDICATED.
(3) CONDUCT FINANCIAL REVIEWS, EARNINGS ANALYSES AND OTHER FINANCIAL STUDIES.
(4) CONDUCT ECONOMIC RESEARCH, FORECASTING, ENERGY CONSERVATION STUDIES, COST STUDIES AND OTHER ECONOMIC STUDIES RELATED TO PUBLIC UTILITIES.
(5) MONITOR INDUSTRY MARKETS TO DETECT ANTICOMPETITIVE, DISCRIMINATORY OR OTHER UNLAWFUL CONDUCT.
(6) INSURE ADEQUATE MAINTENANCE, SAFETY AND RELIABILITY

OF UTILITY NETWORKS.
(7) INSURE ADEQUATE SERVICE QUALITY, EFFICIENCY AND AVAILABILITY AT JUST AND REASONABLE RATES.
(8) CONDUCT FINANCIAL, MANAGEMENT, OPERATIONAL AND SPECIAL AUDITS.
(9) PROVIDE CONSUMER INFORMATION, CONSUMER PROTECTION AND INFORMAL RESOLUTION OF COMPLAINTS.
(10) INSURE ADEQUATE SAFETY, INSURANCE, FITNESS AND OTHER REQUIREMENTS RELEVANT TO TRANSPORTATION UTILITIES.
(11) TAKE APPROPRIATE ENFORCEMENT ACTIONS, INCLUDING RATE PROCEEDINGS, SERVICE PROCEEDINGS AND ALLOCATION PROCEEDINGS, NECESSARY TO INSURE COMPLIANCE WITH THIS TITLE, COMMISSION REGULATIONS AND ORDERS.
(12) PERFORM OTHER FUNCTIONS THE COMMISSION DEEMS NECESSARY FOR THE PROPER WORK OF THE COMMISSION.
(B) PROHIBITION ON COMMINGLING OF FUNCTIONS.--A COMMISSION EMPLOYEE ENGAGED IN A PROSECUTORY FUNCTION MAY NOT, IN THAT MATTER OR A FACTUALLY RELATED MATTER, PROVIDE ADVICE OR ASSISTANCE TO A COMMISSION EMPLOYEE PERFORMING AN ADVISORY FUNCTION AS TO THAT MATTER.
SECTION 1.4. SECTION 2803 OF TITLE 66 IS AMENDED BY ADDING DEFINITIONS TO READ:
§ 2803. DEFINITIONS.
THE FOLLOWING WORDS AND PHRASES WHEN USED IN THIS CHAPTER

SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SECTION UNLESS THE CONTEXT CLEARLY INDICATES OTHERWISE:

* * *

"BILATERAL CONTRACT." AN AGREEMENT, AS APPROVED BY THE PENNSYLVANIA PUBLIC UTILITY COMMISSION, REACHED BY TWO PARTIES, EACH ACTING IN ITS OWN INDEPENDENT SELF-INTEREST, AS A RESULT OF

NEGOTIATIONS FREE OF UNDUE INFLUENCE, DURESS OR FAVORITISM, IN WHICH THE ELECTRIC ENERGY SUPPLIER AGREES TO SELL AND THE ELECTRIC DISTRIBUTION COMPANY AGREES TO BUY A QUANTITY OF ELECTRIC ENERGY AT A SPECIFIED PRICE FOR A SPECIFIED PERIOD OF TIME UNDER TERMS AGREED TO BY BOTH PARTIES, AND WHICH FOLLOWS A STANDARD INDUSTRY TEMPLATE WIDELY ACCEPTED IN THE INDUSTRY OR VARIATIONS THERETO ACCEPTED BY THE PARTIES. STANDARD INDUSTRY TEMPLATES MAY INCLUDE THE EEI MASTER AGREEMENT FOR PHYSICAL ENERGY PURCHASES AND SALES AND THE ISDA MASTER AGREEMENT FOR FINANCIAL ENERGY PURCHASES AND SALES.

* * *

"DEFAULT SERVICE PROVIDER." AN ELECTRIC DISTRIBUTION COMPANY WITHIN ITS CERTIFIED SERVICE TERRITORY OR AN ALTERNATIVE SUPPLIER APPROVED BY THE PENNSYLVANIA PUBLIC UTILITY COMMISSION THAT PROVIDES GENERATION SERVICE TO RETAIL ELECTRIC CUSTOMERS WHO:

(1) CONTRACT FOR ELECTRIC POWER, INCLUDING ENERGY AND CAPACITY, AND THE CHOSEN ELECTRIC GENERATION SUPPLIER DOES NOT SUPPLY THE SERVICE; OR

(2) DO NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER.

* * *

SECTION 2. TITLE 66 IS AMENDED BY ADDING SECTIONS TO READ:

§ 2806.1. ENERGY EFFICIENCY AND CONSERVATION PROGRAM.

(A) PROGRAM.--THE COMMISSION SHALL, BY JANUARY 15, 2009, ADOPT AN ENERGY EFFICIENCY AND CONSERVATION PROGRAM TO REQUIRE ELECTRIC DISTRIBUTION COMPANIES TO ADOPT AND IMPLEMENT COST-EFFECTIVE ENERGY EFFICIENCY AND CONSERVATION PLANS TO REDUCE ENERGY DEMAND AND CONSUMPTION WITHIN THE SERVICE TERRITORY OF EACH ELECTRIC DISTRIBUTION COMPANY IN THIS COMMONWEALTH. THE

PROGRAM SHALL INCLUDE:

(1) PROCEDURES FOR THE APPROVAL OF PLANS SUBMITTED UNDER SUBSECTION (B).

(2) AN EVALUATION PROCESS, INCLUDING A PROCESS TO MONITOR AND VERIFY DATA COLLECTION, QUALITY ASSURANCE AND RESULTS OF EACH PLAN AND THE PROGRAM.

(3) AN ANALYSIS OF THE COST AND BENEFIT OF EACH PLAN SUBMITTED UNDER SUBSECTION (B) IN ACCORDANCE WITH A TOTAL RESOURCE COST TEST APPROVED BY THE COMMISSION.

(4) AN ANALYSIS OF HOW THE PROGRAM AND INDIVIDUAL PLANS WILL ENABLE EACH ELECTRIC DISTRIBUTION COMPANY TO ACHIEVE OR EXCEED THE REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(5) STANDARDS TO ENSURE THAT EACH PLAN INCLUDES A VARIETY OF ENERGY EFFICIENCY AND CONSERVATION MEASURES AND WILL PROVIDE THE MEASURES EQUITABLY TO ALL CLASSES OF CUSTOMERS.

(6) PROCEDURES TO MAKE RECOMMENDATIONS AS TO ADDITIONAL MEASURES THAT WILL ENABLE AN ELECTRIC DISTRIBUTION COMPANY TO IMPROVE ITS PLAN AND EXCEED THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(7) PROCEDURES TO REQUIRE THAT ELECTRIC DISTRIBUTION COMPANIES COMPETITIVELY BID ALL CONTRACTS WITH CONSERVATION SERVICE PROVIDERS.

(8) PROCEDURES TO REVIEW ALL PROPOSED CONTRACTS PRIOR TO THE EXECUTION OF THE CONTRACT WITH CONSERVATION SERVICE PROVIDERS TO IMPLEMENT THE PLAN. THE COMMISSION MAY ORDER THE MODIFICATION OF A PROPOSED CONTRACT TO ENSURE THAT THE PLAN MEETS THE REQUIREMENTS FOR REDUCTION IN DEMAND AND CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(9) PROCEDURES TO ENSURE COMPLIANCE WITH REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(10) A REQUIREMENT FOR THE PARTICIPATION OF CONSERVATION SERVICE PROVIDERS IN THE IMPLEMENTATION OF ALL OR PART OF A PLAN.

(11) COST RECOVERY TO ENSURE THAT MEASURES APPROVED ARE FINANCED BY THE SAME CUSTOMER CLASS THAT WILL RECEIVE THE DIRECT ENERGY AND CONSERVATION BENEFITS.

(B) DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.--

(1) (I) BY JULY 1, 2009, EACH ELECTRIC DISTRIBUTION COMPANY SHALL DEVELOP AND FILE AN ENERGY EFFICIENCY AND CONSERVATION PLAN WITH THE COMMISSION FOR APPROVAL TO MEET THE REQUIREMENTS OF SUBSECTION (A) AND THE REQUIREMENTS FOR REDUCTION IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D). THE PLAN SHALL BE IMPLEMENTED UPON APPROVAL BY THE COMMISSION. THE FOLLOWING ARE THE PLAN REQUIREMENTS:

(A) THE PLAN SHALL INCLUDE SPECIFIC PROPOSALS TO IMPLEMENT ENERGY EFFICIENCY AND CONSERVATION MEASURES TO ACHIEVE OR EXCEED THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(B) A MINIMUM OF 10% OF THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D) SHALL BE OBTAINED FROM UNITS OF FEDERAL, STATE AND LOCAL GOVERNMENT, INCLUDING MUNICIPALITIES, SCHOOL DISTRICTS, INSTITUTIONS OF HIGHER EDUCATION AND NONPROFIT ENTITIES.

(C) THE PLAN SHALL EXPLAIN HOW QUALITY ASSURANCE AND PERFORMANCE WILL BE MEASURED, VERIFIED AND EVALUATED.

(D) THE PLAN SHALL STATE THE MANNER IN WHICH THE PLAN WILL ACHIEVE THE REQUIREMENTS OF THE PROGRAM UNDER SUBSECTION (A) AND WILL ACHIEVE OR EXCEED THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(E) THE PLAN SHALL INCLUDE A CONTRACT WITH ONE OR MORE CONSERVATION SERVICE PROVIDERS SELECTED BY COMPETITIVE BID TO IMPLEMENT THE PLAN OR A PORTION OF THE PLAN AS APPROVED BY THE COMMISSION.

(F) THE PLAN SHALL INCLUDE ESTIMATES OF THE COST OF IMPLEMENTATION OF THE ENERGY EFFICIENCY AND CONSERVATION MEASURES IN THE PLAN.

(G) THE PLAN SHALL INCLUDE SPECIFIC ENERGY EFFICIENCY MEASURES FOR HOUSEHOLDS AT OR BELOW 150% OF THE FEDERAL POVERTY INCOME GUIDELINES. THE NUMBER OF MEASURES SHALL BE PROPORTIONATE TO THOSE HOUSEHOLDS' SHARE OF THE TOTAL ENERGY USAGE IN THE SERVICE TERRITORY. THE ELECTRIC DISTRIBUTION COMPANY SHALL COORDINATE MEASURES UNDER THIS CLAUSE WITH OTHER PROGRAMS ADMINISTERED BY THE COMMISSION OR ANOTHER FEDERAL OR STATE AGENCY. THE EXPENDITURES OF AN ELECTRIC DISTRIBUTION COMPANY UNDER THIS CLAUSE SHALL BE IN ADDITION TO EXPENDITURES MADE UNDER 52 PA. CODE CH. 58 (RELATING TO RESIDENTIAL LOW INCOME USAGE REDUCTION PROGRAMS).

(H) THE PLAN SHALL INCLUDE A PROPOSED COST-RECOVERY TARIFF MECHANISM, IN ACCORDANCE WITH SECTION 1307 (RELATING TO SLIDING SCALE OR RATES; ADJUSTMENTS), TO FUND THE ENERGY EFFICIENCY AND CONSERVATION MEASURES AND TO ENSURE FULL AND CURRENT

RECOVERY OF THE PRUDENT AND REASONABLE COSTS OF THE PLAN, INCLUDING ADMINISTRATIVE COSTS, AS APPROVED BY THE COMMISSION.

(I) THE ELECTRIC DISTRIBUTION COMPANY SHALL DEMONSTRATE THAT THE PLAN IS COST-EFFECTIVE USING A TOTAL RESOURCE COST TEST APPROVED BY THE COMMISSION AND PROVIDES A DIVERSE CROSS SECTION OF ALTERNATIVES FOR CUSTOMERS OF ALL RATE CLASSES.

(J) THE PLAN SHALL REQUIRE AN ANNUAL INDEPENDENT EVALUATION OF ITS COST-EFFECTIVENESS AND A FULL REVIEW OF THE RESULTS OF EACH FIVE-YEAR PLAN REQUIRED UNDER SUBSECTION (C)(3) AND, TO THE EXTENT PRACTICAL, HOW THE PLAN WILL BE ADJUSTED ON A GOING-FORWARD BASIS AS A RESULT OF THE EVALUATION.

(K) THE PLAN SHALL INCLUDE AN ANALYSIS OF THE ELECTRIC DISTRIBUTION COMPANY'S ADMINISTRATIVE COSTS.

(II) A NEW PLAN SHALL BE FILED WITH THE COMMISSION EVERY FIVE YEARS OR AS OTHERWISE REQUIRED BY THE COMMISSION. THE PLAN SHALL SET FORTH THE MANNER IN WHICH THE COMPANY WILL MEET THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(III) NO MORE THAN 2% OF FUNDS AVAILABLE TO IMPLEMENT A PLAN UNDER THIS SUBSECTION SHALL BE ALLOCATED FOR EXPERIMENTAL EQUIPMENT OR DEVICES.

(2) THE COMMISSION SHALL DIRECT AN ELECTRIC DISTRIBUTION COMPANY TO MODIFY OR TERMINATE ANY PART OF A PLAN APPROVED UNDER THIS SECTION IF, AFTER AN ADEQUATE PERIOD FOR IMPLEMENTATION, THE COMMISSION DETERMINES THAT AN ENERGY EFFICIENCY OR CONSERVATION MEASURE INCLUDED IN THE PLAN WILL NOT ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION IN A COST-

EFFECTIVE MANNER UNDER SUBSECTIONS (C) AND (D).

(3) IF PART OF A PLAN IS MODIFIED OR TERMINATED UNDER PARAGRAPH (2), THE ELECTRIC DISTRIBUTION COMPANY SHALL SUBMIT A REVISED PLAN DESCRIBING ACTIONS TO BE TAKEN TO OFFER SUBSTITUTE MEASURES OR TO INCREASE THE AVAILABILITY OF EXISTING MEASURES IN THE PLAN TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(C) REDUCTIONS IN CONSUMPTION.--THE PLANS ADOPTED UNDER SUBSECTION (B) SHALL REDUCE ELECTRIC CONSUMPTION AS FOLLOWS:

(1) BY MAY 31, 2011, TOTAL ANNUAL WEATHER-NORMALIZED CONSUMPTION OF THE RETAIL CUSTOMERS OF EACH ELECTRIC DISTRIBUTION COMPANY SHALL BE REDUCED BY A MINIMUM OF 1%. THE 1% LOAD REDUCTION IN CONSUMPTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S EXPECTED LOAD AS FORECASTED BY THE COMMISSION FOR JUNE 1, 2009, THROUGH MAY 31, 2010, WITH PROVISIONS MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOADS THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE.

(2) BY MAY 31, 2013, THE TOTAL ANNUAL WEATHER-NORMALIZED CONSUMPTION OF THE RETAIL CUSTOMERS OF EACH ELECTRIC DISTRIBUTION COMPANY SHALL BE REDUCED BY A MINIMUM OF 3%. THE 3% LOAD REDUCTION IN CONSUMPTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S EXPECTED LOAD AS FORECASTED BY THE COMMISSION FOR JUNE 1, 2009, THROUGH MAY 31, 2010, WITH PROVISION MADE FOR WEATHER ADJUSTMENTS AND EXTRAORDINARY LOADS THAT THE ELECTRIC DISTRIBUTION COMPANY MUST SERVE.

(3) BY NOVEMBER 30, 2013, AND EVERY FIVE YEARS THEREAFTER, THE COMMISSION SHALL EVALUATE THE COSTS AND BENEFITS OF THE PROGRAM ESTABLISHED UNDER SUBSECTION (A) AND

OF APPROVED ENERGY EFFICIENCY AND CONSERVATION PLANS SUBMITTED TO THE PROGRAM. THE EVALUATION SHALL BE CONSISTENT WITH A TOTAL RESOURCE COST TEST OR A COST-BENEFIT ANALYSIS DETERMINED BY THE COMMISSION. IF THE COMMISSION DETERMINES THAT THE BENEFITS OF THE PROGRAM EXCEED THE COSTS, THE COMMISSION SHALL ADOPT ADDITIONAL REQUIRED INCREMENTAL REDUCTIONS IN CONSUMPTION.

(D) PEAK DEMAND.--THE PLANS ADOPTED UNDER SUBSECTION (B) SHALL REDUCE ELECTRIC DEMAND AS FOLLOWS:

(1) BY MAY 31, 2013, THE WEATHER-NORMALIZED DEMAND OF THE RETAIL CUSTOMERS OF EACH ELECTRIC DISTRIBUTION COMPANY SHALL BE REDUCED BY A MINIMUM OF 4.5% OF ANNUAL SYSTEM PEAK DEMAND IN THE 100 HOURS OF HIGHEST DEMAND. THE REDUCTION SHALL BE MEASURED AGAINST THE ELECTRIC DISTRIBUTION COMPANY'S PEAK DEMAND FOR JUNE 1, 2007, THROUGH MAY 31, 2008.

(2) BY NOVEMBER 30, 2013, THE COMMISSION SHALL COMPARE

THE TOTAL COSTS OF ENERGY EFFICIENCY AND CONSERVATION PLANS IMPLEMENTED UNDER THIS SECTION TO THE TOTAL SAVINGS IN ENERGY AND CAPACITY COSTS TO RETAIL CUSTOMERS IN THIS COMMONWEALTH OR OTHER COSTS DETERMINED BY THE COMMISSION. IF THE COMMISSION DETERMINES THAT THE BENEFITS OF THE PLANS EXCEED THE COSTS, THE COMMISSION SHALL SET ADDITIONAL INCREMENTAL REQUIREMENTS FOR REDUCTION IN PEAK DEMAND FOR THE 100 HOURS OF GREATEST DEMAND OR AN ALTERNATIVE REDUCTION APPROVED BY THE COMMISSION. REDUCTIONS IN DEMAND SHALL BE MEASURED FROM THE ELECTRIC DISTRIBUTION COMPANY'S PEAK DEMAND FOR THE PERIOD FROM JUNE 1, 2011, THROUGH MAY 31, 2012. THE REDUCTIONS IN CONSUMPTION REQUIRED BY THE COMMISSION SHALL BE ACCOMPLISHED NO LATER THAN MAY 31, 2017.

(E) COMMISSION APPROVAL.--

(1) THE COMMISSION SHALL CONDUCT A PUBLIC HEARING ON EACH PLAN AND ALLOW FOR THE SUBMISSION OF RECOMMENDATIONS BY THE OFFICE OF CONSUMER ADVOCATE AND THE OFFICE OF SMALL BUSINESS ADVOCATE AND BY MEMBERS OF THE PUBLIC AS TO HOW THE ELECTRIC DISTRIBUTION COMPANY COULD IMPROVE ITS PLAN OR EXCEED THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTIONS (C) AND (D).

(2) THE COMMISSION SHALL APPROVE OR DISAPPROVE A PLAN FILED UNDER SUBSECTION (B) WITHIN 120 DAYS OF SUBMISSION. THE FOLLOWING SHALL APPLY TO AN ORDER DISAPPROVING A PLAN:

(I) THE COMMISSION SHALL DESCRIBE IN DETAIL THE REASONS FOR THE DISAPPROVAL.

(II) THE ELECTRIC DISTRIBUTION COMPANY SHALL HAVE 60 DAYS TO FILE A REVISED PLAN TO ADDRESS THE DEFICIENCIES IDENTIFIED BY THE COMMISSION. THE REVISED PLAN SHALL BE APPROVED OR DISAPPROVED BY THE COMMISSION WITHIN 60 DAYS.

(F) PENALTIES.--

(1) THE FOLLOWING SHALL APPLY FOR FAILURE TO SUBMIT A PLAN:

(I) AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO FILE A PLAN UNDER SUBSECTION (B) SHALL BE SUBJECT TO A CIVIL PENALTY OF $100,000 PER DAY UNTIL THE PLAN IS FILED.

(II) AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO FILE A REVISED PLAN UNDER SUBSECTION (E)(2)(II) SHALL BE SUBJECT TO A CIVIL PENALTY OF $100,000 PER DAY UNTIL THE PLAN IS FILED.

(III) PENALTIES COLLECTED UNDER THIS PARAGRAPH SHALL BE DEPOSITED IN THE LOW-INCOME ELECTRIC CUSTOMER ASSISTANCE PROGRAM OF THE ENERGY DISTRIBUTION COMPANY FOR

THE RESPECTIVE SERVICE TERRITORY.

(2) THE FOLLOWING SHALL APPLY TO AN ELECTRIC DISTRIBUTION COMPANY THAT FAILS TO ACHIEVE THE REDUCTIONS IN CONSUMPTION REQUIRED UNDER SUBSECTION (C) OR (D):

(I) THE ELECTRIC DISTRIBUTION COMPANY SHALL BE SUBJECT TO A CIVIL PENALTY NOT LESS THAN $1,000,000 AND NOT TO EXCEED $20,000,000 FOR FAILURE TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D). ANY PENALTY PAID BY AN ELECTRIC DISTRIBUTION COMPANY UNDER THIS SUBPARAGRAPH SHALL NOT BE RECOVERABLE FROM RATEPAYERS.

(II) IF AN ELECTRIC DISTRIBUTION COMPANY FAILS TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D), RESPONSIBILITY TO ACHIEVE THE REDUCTIONS IN CONSUMPTION SHALL BE TRANSFERRED TO THE COMMISSION. THE COMMISSION SHALL DO ALL OF THE FOLLOWING:

(A) IMPLEMENT A PLAN TO ACHIEVE THE REQUIRED REDUCTIONS IN CONSUMPTION UNDER SUBSECTION (C) OR (D).

(B) CONTRACT WITH CONSERVATION SERVICE PROVIDERS AS NECESSARY TO IMPLEMENT ANY PORTION OF THE PLAN.

(G) LIMITATION ON COSTS.--THE TOTAL COST OF ANY PLAN REQUIRED UNDER THIS SECTION SHALL NOT EXCEED 2% OF THE ELECTRIC DISTRIBUTION COMPANY'S TOTAL ANNUAL REVENUE AS OF DECEMBER 31,

2006. THE PROVISIONS OF THIS PARAGRAPH SHALL NOT APPLY TO THE COST OF LOW-INCOME USAGE REDUCTION PROGRAMS ESTABLISHED UNDER 52 PA. CODE CH. 58 (RELATING TO RESIDENTIAL LOW INCOME USAGE REDUCTION PROGRAMS).

(H) COSTS.--THE COMMISSION SHALL RECOVER FROM ELECTRIC DISTRIBUTION COMPANIES THE COSTS OF IMPLEMENTING THE PROGRAM

ESTABLISHED UNDER THIS SECTION.

(I) REPORT.--THE FOLLOWING SHALL APPLY:

(1) EACH ELECTRIC DISTRIBUTION COMPANY SHALL SUBMIT AN ANNUAL REPORT TO THE COMMISSION RELATING TO THE RESULTS OF THE ENERGY EFFICIENCY AND CONSERVATION PLAN WITHIN EACH ELECTRIC DISTRIBUTION SERVICE TERRITORY. THE REPORT SHALL INCLUDE ALL OF THE FOLLOWING:

(I) DOCUMENTATION OF PROGRAM EXPENDITURES.

(II) MEASUREMENT AND VERIFICATION OF ENERGY SAVINGS UNDER THE PLAN.

(III) EVALUATION OF THE COST-EFFECTIVENESS OF EXPENDITURES.

(IV) ANY OTHER INFORMATION REQUIRED BY THE COMMISSION.

(2) BEGINNING FIVE YEARS FOLLOWING THE EFFECTIVE DATE OF THIS SECTION AND ANNUALLY THEREAFTER, THE COMMISSION SHALL SUBMIT A REPORT TO THE CONSUMER PROTECTION AND PROFESSIONAL LICENSURE COMMITTEE OF THE SENATE AND THE CONSUMER AFFAIRS COMMITTEE OF THE HOUSE OF REPRESENTATIVES.

(J) EXISTING FUNDING SOURCES.--EACH ELECTRIC DISTRIBUTION COMPANY SHALL, UPON REQUEST BY ANY PERSON, PROVIDE A LIST OF ALL ELIGIBLE FEDERAL AND STATE FUNDING PROGRAMS AVAILABLE TO RATEPAYERS FOR ENERGY EFFICIENCY AND CONSERVATION. THE LIST SHALL BE POSTED ON THE ELECTRIC DISTRIBUTION COMPANY'S INTERNET WEBSITE.

(K) RECOVERY.--

(1) AN ELECTRIC DISTRIBUTION COMPANY SHALL RECOVER ON A FULL AND CURRENT BASIS FROM CUSTOMERS, THROUGH A RECONCILABLE ADJUSTMENT CLAUSE UNDER SECTION 1307, ALL REASONABLE AND PRUDENT COSTS INCURRED IN THE PROVISION OR MANAGEMENT OF A

PLAN PROVIDED UNDER THIS SECTION. THIS PARAGRAPH SHALL APPLY TO ALL ELECTRIC DISTRIBUTION COMPANIES, INCLUDING ELECTRIC DISTRIBUTION COMPANIES SUBJECT TO GENERATION OR OTHER RATE CAPS.

(2) EXCEPT AS SET FORTH IN PARAGRAPH (3), DECREASED REVENUES OF AN ELECTRIC DISTRIBUTION COMPANY DUE TO REDUCED ENERGY CONSUMPTION OR CHANGES IN ENERGY DEMAND SHALL NOT BE A RECOVERABLE COST UNDER A RECONCILABLE AUTOMATIC ADJUSTMENT CLAUSE.

(3) DECREASED REVENUE AND REDUCED ENERGY CONSUMPTION MAY BE REFLECTED IN REVENUE AND SALES DATA USED TO CALCULATE RATES IN A DISTRIBUTION-BASE RATE PROCEEDING FILED BY AN ELECTRIC DISTRIBUTION COMPANY UNDER SECTION 1308 (RELATING TO VOLUNTARY CHANGES IN RATES).

(L) APPLICABILITY.--THIS SECTION SHALL NOT APPLY TO AN ELECTRIC DISTRIBUTION COMPANY WITH FEWER THAN 100,000 CUSTOMERS.

(M) DEFINITIONS.--AS USED IN THIS SECTION, THE FOLLOWING WORDS AND PHRASES SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SUBSECTION:

"CONSERVATION SERVICE PROVIDER." AN ENTITY THAT PROVIDES INFORMATION AND TECHNICAL ASSISTANCE ON MEASURES TO ENABLE A PERSON TO INCREASE ENERGY EFFICIENCY OR REDUCE ENERGY CONSUMPTION AND THAT HAS NO DIRECT OR INDIRECT OWNERSHIP, PARTNERSHIP OR OTHER AFFILIATED INTEREST WITH AN ELECTRIC DISTRIBUTION COMPANY.

"ELECTRIC DISTRIBUTION COMPANY TOTAL ANNUAL REVENUE." AMOUNTS PAID TO THE ELECTRIC DISTRIBUTION COMPANY FOR GENERATION, TRANSMISSION, DISTRIBUTION AND SURCHARGES BY RETAIL CUSTOMERS.

"ENERGY EFFICIENCY AND CONSERVATION MEASURES."

(1) TECHNOLOGIES, MANAGEMENT PRACTICES OR OTHER MEASURES EMPLOYED BY RETAIL CUSTOMERS THAT REDUCE ELECTRICITY CONSUMPTION OR DEMAND IF ALL OF THE FOLLOWING APPLY:

(I) THE TECHNOLOGY, PRACTICE OR OTHER MEASURE IS INSTALLED ON OR AFTER THE EFFECTIVE DATE OF THIS SECTION AT THE LOCATION OF A RETAIL CUSTOMER.

(II) THE TECHNOLOGY, PRACTICE OR OTHER MEASURE REDUCES CONSUMPTION OF ENERGY OR PEAK LOAD BY THE RETAIL CUSTOMER.

(III) THE COST OF THE ACQUISITION OR INSTALLATION OF THE MEASURE IS DIRECTLY INCURRED IN WHOLE OR IN PART BY THE ELECTRIC DISTRIBUTION COMPANY.

(2) ENERGY EFFICIENCY AND CONSERVATION MEASURES SHALL INCLUDE SOLAR OR SOLAR PHOTOVOLTAIC PANELS, ENERGY EFFICIENT WINDOWS AND DOORS, ENERGY EFFICIENT LIGHTING, INCLUDING EXIT SIGN RETROFIT, HIGH BAY FLUORESCENT RETROFIT AND PEDESTRIAN AND TRAFFIC SIGNAL CONVERSION, GEOTHERMAL HEATING, INSULATION, AIR SEALING, REFLECTIVE ROOF COATINGS, ENERGY EFFICIENT HEATING AND COOLING EQUIPMENT OR SYSTEMS AND ENERGY EFFICIENT APPLIANCES AND OTHER TECHNOLOGIES, PRACTICES OR MEASURES APPROVED BY THE COMMISSION.

"PEAK DEMAND." THE HIGHEST ELECTRICAL REQUIREMENT OCCURRING DURING A SPECIFIED PERIOD. FOR AN ELECTRIC DISTRIBUTION COMPANY, THE TERM SHALL MEAN THE SUM OF THE METERED CONSUMPTION FOR ALL RETAIL CUSTOMERS OVER THAT PERIOD.

"QUALITY ASSURANCE." ALL OF THE FOLLOWING:

(1) THE AUDITING OF BUILDINGS, EQUIPMENT AND PROCESSES TO DETERMINE THE COST-EFFECTIVENESS OF ENERGY EFFICIENCY AND CONSERVATION MEASURES USING NATIONALLY RECOGNIZED TOOLS AND CERTIFICATION PROGRAMS.

(2) INDEPENDENT INSPECTION OF COMPLETED ENERGY EFFICIENCY AND CONSERVATION MEASURES COMPLETED BY THIRD-PARTY ENTITIES TO EVALUATE THE QUALITY OF THE COMPLETED MEASURE.

"REAL-TIME PRICE." A RATE THAT DIRECTLY REFLECTS THE DIFFERENT COST OF ENERGY DURING EACH HOUR.

"TIME-OF-USE RATE." A RATE THAT REFLECTS THE COSTS OF SERVING CUSTOMERS DURING DIFFERENT TIME PERIODS, INCLUDING OFF-PEAK AND ON-PEAK PERIODS, BUT NOT AS FREQUENTLY AS EACH HOUR.

"TOTAL RESOURCE COST TEST." A STANDARD TEST THAT IS MET IF, OVER THE EFFECTIVE LIFE OF EACH PLAN NOT TO EXCEED 15 YEARS, THE NET PRESENT VALUE OF THE AVOIDED MONETARY COST OF SUPPLYING ELECTRICITY IS GREATER THAN THE NET PRESENT VALUE OF THE MONETARY COST OF ENERGY EFFICIENCY CONSERVATION MEASURES.

§ 2806.2. ENERGY EFFICIENCY AND CONSERVATION.

(A) REGISTRY.--THE COMMISSION SHALL, BY MARCH 1, 2009, ESTABLISH A REGISTRY OF APPROVED PERSONS QUALIFIED TO PROVIDE CONSERVATION SERVICES TO ALL CLASSES OF CUSTOMERS. IN ORDER TO BE INCLUDED IN THE REGISTRY, A CONSERVATION SERVICE PROVIDER MUST MEET EXPERIENCE AND OTHER QUALIFICATIONS DETERMINED BY THE COMMISSION.

(B) APPLICATION.--THE COMMISSION SHALL DEVELOP AN APPLICATION FOR REGISTRATION UNDER SUBSECTION (A) AND MAY CHARGE A REASONABLE REGISTRATION FEE.

SECTION 3. SECTION 2807(E) OF TITLE 66 IS AMENDED AND THE SECTION IS AMENDED BY ADDING SUBSECTIONS TO READ:

§ 2807. DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.

* * *

(E) OBLIGATION TO SERVE.--[AN ELECTRIC DISTRIBUTION COMPANY'S] A DEFAULT SERVICE PROVIDER'S OBLIGATION TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE FOLLOWING [IMPLEMENTATION OF

RESTRUCTURING AND THE CHOICE OF ALTERNATIVE GENERATION BY A CUSTOMER] THE EXPIRATION OF A GENERATION RATE CAP SPECIFIED UNDER SECTION 2804(4) (RELATING TO STANDARDS FOR RESTRUCTURING OF ELECTRIC INDUSTRY) OR A RESTRUCTURING PLAN UNDER SECTION 2806(F) (RELATING TO IMPLEMENTATION, PILOT PROGRAMS AND PERFORMANCE-BASED RATES) IS REVISED AS FOLLOWS:

(1) WHILE AN ELECTRIC DISTRIBUTION COMPANY COLLECTS EITHER A COMPETITIVE TRANSITION CHARGE OR AN INTANGIBLE

TRANSITION CHARGE OR UNTIL 100% OF ITS CUSTOMERS HAVE CHOICE, WHICHEVER IS LONGER, THE ELECTRIC DISTRIBUTION COMPANY SHALL CONTINUE TO HAVE THE FULL OBLIGATION TO SERVE, INCLUDING THE CONNECTION OF CUSTOMERS, THE DELIVERY OF ELECTRIC ENERGY AND THE PRODUCTION OR ACQUISITION OF ELECTRIC ENERGY FOR CUSTOMERS.

[(2) AT THE END OF THE TRANSITION PERIOD, THE COMMISSION SHALL PROMULGATE REGULATIONS TO DEFINE THE ELECTRIC DISTRIBUTION COMPANY'S OBLIGATION TO CONNECT AND DELIVER AND ACQUIRE ELECTRICITY UNDER PARAGRAPH (3) THAT WILL EXIST AT THE END OF THE PHASE-IN PERIOD.

(3) IF A CUSTOMER CONTRACTS FOR ELECTRIC ENERGY AND IT IS NOT DELIVERED OR IF A CUSTOMER DOES NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER, THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER SHALL ACQUIRE ELECTRIC ENERGY AT PREVAILING MARKET PRICES TO SERVE THAT CUSTOMER AND SHALL RECOVER FULLY ALL REASONABLE COSTS.]

(3.1) FOLLOWING THE EXPIRATION OF AN ELECTRIC DISTRIBUTION COMPANY'S OBLIGATION TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE TO RETAIL CUSTOMERS AT CAPPED RATES, IF A CUSTOMER CONTRACTS FOR ELECTRIC GENERATION SUPPLY

SERVICE AND THE CHOSEN ELECTRIC GENERATION SUPPLIER DOES NOT PROVIDE THE SERVICE OR IF A CUSTOMER DOES NOT CHOOSE AN ALTERNATIVE ELECTRIC GENERATION SUPPLIER, THE DEFAULT SERVICE PROVIDER SHALL PROVIDE ELECTRIC GENERATION SUPPLY SERVICE TO THAT CUSTOMER PURSUANT TO A COMMISSION-APPROVED COMPETITIVE PROCUREMENT PLAN. THE ELECTRIC POWER ACQUIRED SHALL BE PROCURED THROUGH COMPETITIVE PROCUREMENT PROCESSES AND SHALL INCLUDE ONE OR MORE OF THE FOLLOWING:

(I) AUCTIONS.

(II) REQUESTS FOR PROPOSAL.

(III) BILATERAL AGREEMENTS ENTERED INTO AT THE SOLE DISCRETION OF THE DEFAULT SERVICE PROVIDER WHICH SHALL BE AT PRICES WHICH ARE:

(A) NO GREATER THAN THE COST OF OBTAINING GENERATION UNDER COMPARABLE TERMS IN THE WHOLESALE MARKET, AS DETERMINED BY THE COMMISSION AT THE TIME OF EXECUTION OF THE CONTRACT; OR

(B) CONSISTENT WITH A COMMISSION-APPROVED COMPETITION PROCUREMENT PROCESS. ANY AGREEMENT BETWEEN AFFILIATED PARTIES SHALL BE SUBJECT TO REVIEW AND APPROVAL OF THE PENNSYLVANIA PUBLIC UTILITY COMMISSION UNDER CHAPTER 21 (RELATING TO RELATIONS WITH AFFILIATED INTERESTS). IN NO CASE SHALL THE COST OF OBTAINING GENERATION FROM ANY AFFILIATED INTEREST BE GREATER THAN THE COST OF OBTAINING GENERATION UNDER COMPARABLE TERMS IN THE WHOLESALE MARKET AT THE TIME OF EXECUTION OF THE CONTRACT.

(3.2) THE ELECTRIC POWER PROCURED PURSUANT TO PARAGRAPH (3.1) SHALL INCLUDE A PRUDENT MIX OF THE FOLLOWING:

(I) SPOT MARKET PURCHASES.

(II) SHORT-TERM CONTRACTS.

(III) LONG-TERM PURCHASE CONTRACTS, ENTERED INTO AS A RESULT OF AN AUCTION, REQUEST FOR PROPOSAL OR BILATERAL CONTRACT THAT IS FREE OF UNDUE INFLUENCE, DURESS OR FAVORITISM, OF MORE THAN FOUR AND NOT MORE THAN 20 YEARS. THE DEFAULT SERVICE PROVIDER SHALL HAVE SOLE DISCRETION TO DETERMINE THE SOURCE AND FUEL TYPE. LONG-TERM PURCHASE CONTRACTS UNDER THIS SUBPARAGRAPH MAY NOT CONSTITUTE MORE THAN 25% OF THE DEFAULT SERVICE PROVIDER'S PROJECTED DEFAULT SERVICE LOAD UNLESS THE COMMISSION, AFTER A HEARING, DETERMINES FOR GOOD CAUSE THAT A GREATER PORTION OF LOAD IS NECESSARY TO ACHIEVE LEAST COST PROCUREMENT. THIS SUBPARAGRAPH SHALL NOT APPLY TO CONTRACTS EXECUTED UNDER PARAGRAPH (5).

(3.3) THE COMMISSION MAY DETERMINE THAT A CONTRACT IS REQUIRED TO BE EXTENDED FOR A LONGER TERM OF UP TO 20 YEARS,

IF THE EXTENSION IS NECESSARY TO ENSURE ADEQUATE AND RELIABLE SERVICE AT LEAST COST TO CUSTOMERS OVER TIME.

(3.4) THE PRUDENT MIX OF CONTRACTS ENTERED INTO PURSUANT TO PARAGRAPHS (3.2) AND (3.3) SHALL BE DESIGNED TO ENSURE:

(I) ADEQUATE AND RELIABLE SERVICE.

(II) THE LEAST COST TO CUSTOMERS OVER TIME.

(III) COMPLIANCE WITH THE REQUIREMENTS OF PARAGRAPH (3.1).

(3.5) EXCEPT AS SET FORTH IN PARAGRAPH (5)(II), THE PROVISIONS OF THIS SECTION SHALL APPLY TO ANY TYPE OF ENERGY PURCHASED BY A DEFAULT SERVICE PROVIDER TO PROVIDE ELECTRIC GENERATION SUPPLY SERVICE, INCLUDING ENERGY OR ALTERNATIVE ENERGY PORTFOLIO STANDARDS CREDITS REQUIRED TO BE PURCHASED UNDER THE ACT OF NOVEMBER 30, 2004 (P.L.1672, NO.213), KNOWN

AS THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT. THE COMMISSION SHALL APPLY PARAGRAPH (3.4) TO COMPARABLE TYPES OF ENERGY SOURCES.

(3.6) THE DEFAULT SERVICE PROVIDER SHALL FILE A PLAN FOR COMPETITIVE PROCUREMENT WITH THE COMMISSION AND OBTAIN COMMISSION APPROVAL OF THE PLAN CONSIDERING THE STANDARDS IN PARAGRAPHS (3.1), (3.2), (3.3) AND (3.4) BEFORE THE COMPETITIVE PROCESS IS IMPLEMENTED. THE COMMISSION SHALL HOLD HEARINGS AS NECESSARY ON THE PROPOSED PLAN. IF THE COMMISSION FAILS TO ISSUE A FINAL ORDER ON THE PLAN WITHIN NINE MONTHS OF THE DATE THAT THE PLAN IS FILED, THE PLAN SHALL BE DEEMED TO BE APPROVED AND THE DEFAULT SERVICE PROVIDER MAY IMPLEMENT THE PLAN AS FILED. COSTS INCURRED THROUGH AN APPROVED COMPETITIVE PROCUREMENT PLAN SHALL BE DEEMED TO BE THE LEAST COST OVER TIME AS REQUIRED UNDER PARAGRAPH (3.4)(II).

(3.7) AT THE TIME THE COMMISSION EVALUATES THE PLAN AND PRIOR TO APPROVAL, IN DETERMINING IF THE DEFAULT ELECTRIC SERVICE PROVIDER'S PLAN OBTAINS GENERATION SUPPLY AT THE LEAST COST, THE COMMISSION SHALL CONSIDER THE DEFAULT SERVICE PROVIDER'S OBLIGATION TO PROVIDE ADEQUATE AND RELIABLE SERVICE TO CUSTOMERS AND THAT THE DEFAULT SERVICE PROVIDER HAS OBTAINED A PRUDENT MIX OF CONTRACTS TO OBTAIN LEAST COST ON A LONG-TERM, SHORT-TERM AND SPOT MARKET BASIS AND SHALL MAKE SPECIFIC FINDINGS WHICH SHALL INCLUDE THE FOLLOWING:

(I) THE DEFAULT SERVICE PROVIDER'S PLAN INCLUDES PRUDENT STEPS NECESSARY TO NEGOTIATE FAVORABLE GENERATION SUPPLY CONTRACTS.

(II) THE DEFAULT SERVICE PROVIDER'S PLAN INCLUDES PRUDENT STEPS NECESSARY TO OBTAIN LEAST COST GENERATION SUPPLY CONTRACTS ON A LONG-TERM, SHORT-TERM AND SPOT

MARKET BASIS.

(III) NEITHER THE DEFAULT SERVICE PROVIDER NOR ITS AFFILIATED INTEREST HAS WITHHELD FROM THE MARKET ANY GENERATION SUPPLY IN A MANNER THAT VIOLATES FEDERAL LAW.

(3.8) NOTWITHSTANDING SECTIONS 508 (RELATING TO POWER OF COMMISSION TO VARY, REFORM AND REVISE CONTRACTS) AND 2102 (RELATING TO APPROVAL OF CONTRACTS WITH AFFILIATED INTERESTS), THE COMMISSION MAY MODIFY CONTRACTS OR DISALLOW COSTS ONLY WHEN THE PARTY SEEKING RECOVERY OF THE COSTS OF A PROCUREMENT PLAN IS, AFTER HEARING, FOUND TO BE AT FAULT FOR THE FOLLOWING:

(I) NOT COMPLYING WITH THE COMMISSION-APPROVED PROCUREMENT PLAN; OR

(II) THE COMMISSION OF FRAUD, COLLUSION OR MARKET MANIPULATION WITH REGARD TO THESE CONTRACTS.

(3.9) THE DEFAULT SERVICE PROVIDER SHALL HAVE THE RIGHT TO RECOVER ON A FULL AND CURRENT BASIS, PURSUANT TO A RECONCILABLE AUTOMATIC ADJUSTMENT CLAUSE UNDER SECTION 1307 (RELATING TO SLIDING SCALE OF RATES; ADJUSTMENTS), ALL REASONABLE COSTS INCURRED UNDER THIS SECTION AND A COMMISSION-APPROVED COMPETITIVE PROCUREMENT PLAN.

(4) IF A CUSTOMER THAT CHOOSES AN ALTERNATIVE SUPPLIER AND SUBSEQUENTLY DESIRES TO RETURN TO THE LOCAL DISTRIBUTION COMPANY FOR GENERATION SERVICE, THE LOCAL DISTRIBUTION

COMPANY SHALL TREAT THAT CUSTOMER EXACTLY AS IT WOULD ANY NEW APPLICANT FOR ENERGY SERVICE.

(5) (I) NOTWITHSTANDING PARAGRAPH [(3)] (3.1), THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER MAY, IN ITS SOLE DISCRETION, OFFER LARGE CUSTOMERS WITH A PEAK DEMAND OF 15 MEGAWATTS OR

GREATER AT ONE METER AT A LOCATION IN ITS SERVICE TERRITORY ANY NEGOTIATED RATE FOR SERVICE AT ALL OF THE CUSTOMERS' LOCATIONS WITHIN THE SERVICE TERRITORY FOR ANY DURATION AGREED UPON BY THE ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER AND THE LARGE CUSTOMER. THE COMMISSION SHALL PERMIT, BUT SHALL NOT REQUIRE, AN ELECTRIC DISTRIBUTION COMPANY OR COMMISSION-APPROVED ALTERNATIVE SUPPLIER TO PROVIDE SERVICE TO LARGE CUSTOMERS UNDER THIS PARAGRAPH. CONTRACT RATES ENTERED INTO UNDER THIS PARAGRAPH SHALL BE SUBJECT TO REVIEW BY THE COMMISSION IN ORDER TO ENSURE THAT ALL COSTS RELATED TO THE RATES ARE BORNE BY THE PARTIES TO THE CONTRACT AND THAT NO COSTS RELATED TO THE RATES ARE BORNE BY OTHER CUSTOMERS OR CUSTOMER CLASSES. IF NO COSTS RELATED TO THE RATES ARE BORNE BY OTHER CUSTOMERS OR CUSTOMER CLASSES, THE COMMISSION SHALL APPROVE THE CONTRACT WITHIN 90 DAYS OF ITS FILING, OR IT SHALL BE DEEMED APPROVED BY OPERATION OF LAW UPON EXPIRATION OF THE 90 DAYS. INFORMATION SUBMITTED UNDER THIS PARAGRAPH SHALL BE SUBJECT TO THE COMMISSION'S PROCEDURES FOR THE FILING OF CONFIDENTIAL AND PROPRIETARY INFORMATION.

(II) FOR PURPOSES OF PROVIDING SERVICE UNDER THIS PARAGRAPH TO CUSTOMERS WITH A PEAK DEMAND OF 20 MEGAWATTS OR GREATER AT ONE METER AT A LOCATION WITHIN THAT DISTRIBUTION COMPANY'S SERVICE TERRITORY, AN ELECTRIC DISTRIBUTION COMPANY THAT HAS COMPLETED ITS RESTRUCTURING TRANSITION PERIOD AS OF THE EFFECTIVE DATE OF THIS PARAGRAPH MAY, IN ITS SOLE DISCRETION, ACQUIRE AN INTEREST IN A GENERATION FACILITY OR CONSTRUCT A GENERATION FACILITY SPECIFICALLY TO MEET THE ENERGY

REQUIREMENTS OF THE CUSTOMERS, INCLUDING THE ELECTRIC REQUIREMENTS OF THE CUSTOMERS' OTHER BILLING LOCATIONS WITHIN ITS SERVICE TERRITORY. THE ELECTRIC DISTRIBUTION COMPANY MUST COMMENCE CONSTRUCTION OF THE GENERATION FACILITY OR CONTRACT TO ACQUIRE THE GENERATION INTEREST WITHIN THREE YEARS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, EXCEPT THAT THE ELECTRIC DISTRIBUTION COMPANY MAY ADD TO THE GENERATION FACILITIES IT COMMENCED CONSTRUCTION OR CONTRACTED TO ACQUIRE AFTER THIS THREE-YEAR PERIOD TO SERVE ADDITIONAL LOAD OF CUSTOMERS FOR WHOM IT COMMENCED CONSTRUCTION OR CONTRACTED TO ACQUIRE GENERATION WITHIN THREE YEARS. NOTHING IN THIS PARAGRAPH REQUIRES OR AUTHORIZES THE COMMISSION TO REQUIRE AN ELECTRIC DISTRIBUTION COMPANY TO COMMENCE CONSTRUCTION OR ACQUIRE AN INTEREST IN A GENERATION FACILITY. THE ELECTRIC DISTRIBUTION COMPANY'S INTEREST IN THE GENERATION FACILITY IT BUILT OR CONTRACTED TO ACQUIRE SHALL BE NO LARGER THAN NECESSARY TO MEET PEAK DEMAND OF CUSTOMERS SERVED UNDER THIS SUBPARAGRAPH. DURING TIMES WHEN THE CUSTOMER'S DEMAND IS LESS THAN THE ELECTRIC DISTRIBUTION COMPANY'S GENERATION INTEREST, THE ELECTRIC DISTRIBUTION COMPANY MAY SELL EXCESS POWER ON THE WHOLESALE MARKET. AT NO TIME SHALL THE COSTS ASSOCIATED WITH THE GENERATING FACILITY INTERESTS BE INCLUDED IN RATE BASE OR OTHERWISE REFLECTED IN RATES. THE GENERATION FACILITY INTERESTS SHALL NOT BE COMMISSION-REGULATED ASSETS.

(6) A DEFAULT SERVICE PLAN APPROVED BY THE COMMISSION PRIOR TO THE EFFECTIVE DATE OF THIS SECTION SHALL REMAIN IN EFFECT THROUGH ITS APPROVED TERM. AT ITS SOLE DISCRETION, THE

DEFAULT SERVICE PROVIDER MAY PROPOSE AMENDMENTS TO ITS APPROVED PLAN THAT ARE CONSISTENT WITH THIS SECTION, AND THE COMMISSION SHALL ISSUE A DECISION WHETHER TO APPROVE OR DISAPPROVE THE PROPOSED AMENDMENTS WITHIN NINE MONTHS OF THE DATE THAT THE AMENDMENTS ARE FILED. IF THE COMMISSION FAILS TO ISSUE A FINAL ORDER WITHIN NINE MONTHS, THE AMENDMENTS SHALL BE DEEMED TO BE APPROVED AND THE DEFAULT SERVICE PROVIDER MAY IMPLEMENT THE AMENDMENTS AS FILED.

(7) THE DEFAULT SERVICE PROVIDER SHALL OFFER RESIDENTIAL AND SMALL BUSINESS CUSTOMERS A GENERATION SUPPLY SERVICE RATE THAT SHALL CHANGE NO MORE FREQUENTLY THAN ON A QUARTERLY BASIS. ALL DEFAULT SERVICE RATES SHALL BE REVIEWED BY THE COMMISSION TO ENSURE THAT THE COSTS OF PROVIDING SERVICE TO EACH CUSTOMER CLASS ARE NOT SUBSIDIZED BY ANY OTHER CLASS.

(F) SMART METER TECHNOLOGY AND TIME OF USE RATES.--

(1) WITHIN NINE MONTHS AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH, ELECTRIC DISTRIBUTION COMPANIES SHALL FILE A SMART METER TECHNOLOGY PROCUREMENT AND INSTALLATION PLAN WITH THE COMMISSION FOR APPROVAL. THE PLAN SHALL DESCRIBE THE SMART METER TECHNOLOGIES THE ELECTRIC DISTRIBUTION COMPANY PROPOSES TO INSTALL IN ACCORDANCE WITH PARAGRAPH (2).

(2) ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS:

(I) UPON REQUEST FROM A CUSTOMER THAT AGREES TO PAY THE COST OF THE SMART METER AT THE TIME OF THE REQUEST.

(II) IN NEW BUILDING CONSTRUCTION.

(III) IN ACCORDANCE WITH A DEPRECIATION SCHEDULE NOT TO EXCEED 15 YEARS.

(3) ELECTRIC DISTRIBUTION COMPANIES SHALL, WITH CUSTOMER CONSENT, MAKE AVAILABLE DIRECT METER ACCESS AND ELECTRONIC

ACCESS TO CUSTOMER METER DATA TO THIRD PARTIES, INCLUDING ELECTRIC GENERATION SUPPLIERS AND PROVIDERS OF CONSERVATION AND LOAD MANAGEMENT SERVICES.

(4) IN NO EVENT SHALL LOST OR DECREASED REVENUES BY AN ELECTRIC DISTRIBUTION COMPANY DUE TO REDUCED ELECTRICITY CONSUMPTION OR SHIFTING ENERGY DEMAND BE CONSIDERED ANY OF THE FOLLOWING:

(I) A COST OF SMART METER TECHNOLOGY RECOVERABLE UNDER A RECONCILABLE AUTOMATIC ADJUSTMENT CLAUSE UNDER SECTION 1307(B), EXCEPT THAT DECREASED REVENUES AND REDUCED ENERGY CONSUMPTION MAY BE REFLECTED IN THE REVENUE AND SALES DATA USED TO CALCULATE RATES IN A DISTRIBUTION RATE BASE RATE PROCEEDING FILED UNDER SECTION 1308 (RELATING TO VOLUNTARY CHANGE IN RATES).

(II) A RECOVERABLE COST.

(5) BY JANUARY 1, 2010, OR AT THE END OF THE APPLICABLE GENERATION RATE CAP PERIOD, WHICHEVER IS LATER, A DEFAULT SERVICE PROVIDER SHALL SUBMIT TO THE COMMISSION ONE OR MORE PROPOSED TIME-OF-USE RATES AND REAL-TIME PRICE PLANS. THE COMMISSION SHALL APPROVE OR MODIFY THE TIME-OF-USE RATES AND REAL-TIME PRICE PLAN WITHIN SIX MONTHS OF SUBMITTAL. THE DEFAULT SERVICE PROVIDER SHALL OFFER THE TIME-OF-USE RATES AND REAL-TIME PRICE PLAN TO ALL CUSTOMERS THAT HAVE BEEN PROVIDED WITH SMART METER TECHNOLOGY UNDER PARAGRAPH (2)(III). RESIDENTIAL OR COMMERCIAL CUSTOMERS MAY ELECT TO PARTICIPATE IN TIME-OF-USE RATES OR REAL-TIME PRICING. THE DEFAULT SERVICE PROVIDER SHALL SUBMIT AN ANNUAL REPORT TO THE PRICE PROGRAMS AND THE EFFICACY OF THE PROGRAMS IN AFFECTING ENERGY DEMAND AND CONSUMPTION AND THE EFFECT ON WHOLESALE MARKET PRICES.

(6) THE PROVISIONS OF THIS SUBSECTION SHALL NOT APPLY TO AN ELECTRIC DISTRIBUTION COMPANY WITH 100,000 OR FEWER CUSTOMERS.

(7) AN ELECTRIC DISTRIBUTION COMPANY MAY RECOVER REASONABLE AND PRUDENT COSTS OF PROVIDING SMART METER TECHNOLOGY UNDER PARAGRAPH (2)(II) AND (III), AS DETERMINED BY THE COMMISSION. THIS PARAGRAPH INCLUDES ANNUAL DEPRECIATION AND CAPITAL COSTS OVER THE LIFE OF THE SMART

METER TECHNOLOGY AND THE COST OF ANY SYSTEM UPGRADES THAT THE ELECTRIC DISTRIBUTION COMPANY MAY REQUIRE TO ENABLE THE USE OF THE SMART METER TECHNOLOGY WHICH ARE INCURRED AFTER THE EFFECTIVE DATE OF THIS PARAGRAPH LESS OPERATING AND CAPITAL COST SAVINGS REALIZED BY THE ELECTRIC DISTRIBUTION COMPANY FROM THE INSTALLATION AND USE OF THE SMART METER TECHNOLOGY. SMART METER TECHNOLOGY SHALL BE DEEMED TO BE A NEW SERVICE OFFERED FOR THE FIRST TIME UNDER SECTION 2804(4)(VI). AN ELECTRIC DISTRIBUTION COMPANY MAY RECOVER SMART METER TECHNOLOGY COSTS:

(I) THROUGH BASE RATES, INCLUDING A DEFERRAL FOR FUTURE BASE RATE RECOVERY OF CURRENT BASIS WITH CARRYING CHARGE AS DETERMINED BY THE COMMISSION; OR

(II) ON A FULL AND CURRENT BASIS THROUGH A RECONCILABLE AUTOMATIC ADJUSTMENT CLAUSE UNDER SECTION 1307.

(G) DEFINITION.--AS USED IN THIS SECTION, THE TERM "SMART METER TECHNOLOGY" MEANS TECHNOLOGY, INCLUDING METERING TECHNOLOGY AND NETWORK COMMUNICATIONS TECHNOLOGY CAPABLE OF BIDIRECTIONAL COMMUNICATION, THAT RECORDS ELECTRICITY USAGE ON AT LEAST AN HOURLY BASIS, INCLUDING RELATED ELECTRIC DISTRIBUTION SYSTEM UPGRADES TO ENABLE THE TECHNOLOGY. THE

TECHNOLOGY SHALL PROVIDE CUSTOMERS WITH DIRECT ACCESS TO AND USE OF PRICE AND CONSUMPTION INFORMATION. THE TECHNOLOGY SHALL ALSO:

(1) DIRECTLY PROVIDE CUSTOMERS WITH INFORMATION ON THEIR HOURLY CONSUMPTION.

(2) ENABLE TIME-OF-USE RATES AND REAL-TIME PRICE PROGRAMS.

(3) EFFECTIVELY SUPPORT THE AUTOMATIC CONTROL OF THE CUSTOMER'S ELECTRICITY CONSUMPTION BY ONE OR MORE OF THE FOLLOWING AS SELECTED BY THE CUSTOMER:

(I) THE CUSTOMER;

(II) THE CUSTOMER'S UTILITY; OR

(III) A THIRD PARTY ENGAGED BY THE CUSTOMER OR THE CUSTOMER'S UTILITY.

SECTION 4. SECTION 2811 OF TITLE 66 IS AMENDED BY ADDING A SUBSECTION TO READ:

§ 2811. MARKET POWER REMEDIATION.

* * *

(E.1) MARKET MISCONDUCT.--

(1) IF AN ELECTRIC DISTRIBUTION COMPANY OR ANY OF ITS AFFILIATED COMPANIES OR ANY COMPANY THAT AN ELECTRIC DISTRIBUTION COMPANY HAS PURCHASED GENERATION FROM IS FOUND GUILTY OF MARKET MANIPULATION, EXERCISING MARKET POWER OR COLLUSION BY THE FEDERAL ENERGY REGULATORY COMMISSION OR ANY FEDERAL OR STATE COURT OR, IF AN ELECTRIC DISTRIBUTION COMPANY OR ANY ONE OF ITS AFFILIATED COMPANIES OR ANY COMPANY THAT AN ELECTRIC DISTRIBUTION COMPANY HAS PURCHASED GENERATION FROM SETTLES A CLAIM OF MARKET MANIPULATION, EXERCISING MARKET POWER OR COLLUSION THAT IS BROUGHT BY A REGIONAL TRANSMISSION OPERATOR'S MARKET MONITORING UNIT, THE FEDERAL ENERGY REGULATORY COMMISSION OR ANOTHER ENTITY, THE

COMMISSION:

(I) SHALL DIRECT THE ELECTRIC DISTRIBUTION COMPANY TO TAKE ANY AND ALL REASONABLE ACTION TO QUANTIFY THE EFFECT OF THE MARKET MISCONDUCT UPON PENNSYLVANIA RATEPAYERS.

(II) FOLLOWING PUBLIC HEARING ON THE MATTER AND A FINDING OF PUBLIC INTEREST, MAY DIRECT THE ELECTRIC DISTRIBUTION COMPANY TO TAKE ANY AND ALL REASONABLE LEGAL ACTION, INCLUDING THE FILING OF A LAWSUIT AS MAY BE NECESSARY, TO RECOVER THE QUANTIFIED DAMAGES WHICH SHALL BE USED TO RECOMPENSE PENNSYLVANIA RATEPAYERS AFFECTED BY THE MARKET MISCONDUCT.

(2) IF THE ELECTRIC DISTRIBUTION COMPANY FAILS TO PURSUE REASONABLE ACTION TO QUANTIFY OR SEEK RECOVERY OF DAMAGES FOR PENNSYLVANIA RATEPAYERS AFFECTED BY MARKET MANIPULATION, THE EXERCISE OF MARKET POWER OR COLLUSION, THE COMMISSION IS

AUTHORIZED, FOLLOWING NOTICE AND AN OPPORTUNITY OF THE ELECTRIC DISTRIBUTION COMPANY TO COMPLY OR CONTEST, TO ASSESS A CIVIL PENALTY, WHICH SHALL NOT BE RECOVERED IN RATES, OF NOT MORE THAN $10,000 PER DAY FOR FAILURE OR NEGLECT TO OBEY AN ORDER OF THE COMMISSION, THE CONTINUANCE OF THE FAILURE OR NEGLECT BEING A SEPARATE OFFENSE.

(3) ANY MONETARY DAMAGES RECOVERED BY THE ELECTRIC DISTRIBUTION COMPANY SHALL BE PAID TO AFFECTED PENNSYLVANIA RATEPAYERS IN THE FORM OF A CREDIT TO THEIR ELECTRIC BILLS OR AS REFUNDS.

(4) THE PROVISIONS OF THIS SUBSECTION SHALL BE HELD TO BE IN ADDITION TO AND NOT IN SUBSTITUTION FOR OR LIMITATION OF ANY OTHER PROVISIONS OF THIS TITLE.

* * *

SECTION 5. TITLE 66 IS AMENDED BY ADDING SECTIONS TO READ:

§ 2813. PROCUREMENT OF POWER.

EXCEPT AS PROVIDED UNDER THE ACT OF NOVEMBER 30, 2004 (P.L.1672, NO.213), KNOWN AS THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT, THE COMMISSION MAY NOT ORDER A DEFAULT SERVICE PROVIDER TO PROCURE POWER FROM A SPECIFIC GENERATION SUPPLIER, FROM A SPECIFIC GENERATION FUEL TYPE OR FROM NEW GENERATION ONLY.

§ 2814. ADDITIONAL ALTERNATIVE ENERGY SOURCES.

(A) ALTERNATIVE ENERGY SOURCES.--THE TERM "ALTERNATIVE ENERGY SOURCES" AS DEFINED UNDER SECTION 2 OF THE ACT OF NOVEMBER 30, 2004 (P.L.1672, NO.213), KNOWN AS THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT, SHALL ALSO INCLUDE LOW-IMPACT HYDROPOWER CONSISTING OF ANY TECHNOLOGY THAT PRODUCES ELECTRIC POWER AND THAT HARNESSES THE HYDROELECTRIC POTENTIAL OF MOVING WATER IMPOUNDMENTS IF ONE OF THE FOLLOWING APPLIES:

(1) (I) THE HYDROPOWER SOURCE HAS A FEDERAL ENERGY REGULATORY COMMISSION LICENSED CAPACITY OF 21 MEGAWATTS OR LESS; AND

(II) THE LICENSE FOR THE HYDROPOWER SOURCE WAS ISSUED BY THE FEDERAL ENERGY REGULATORY COMMISSION ON OR PRIOR TO JANUARY 1, 1984, AND HELD ON JULY 1, 2007, IN WHOLE OR IN PART BY A MUNICIPALITY LOCATED WHOLLY WITHIN THIS COMMONWEALTH OR BY AN ELECTRIC COOPERATIVE INCORPORATED IN THIS COMMONWEALTH.

(2) THE INCREMENTAL HYDROELECTRIC DEVELOPMENT:

(I) DOES NOT ADVERSELY CHANGE EXISTING IMPACTS TO AQUATIC SYSTEMS;

(II) MEETS THE CERTIFICATION STANDARDS ESTABLISHED BY THE LOW IMPACT HYDROPOWER INSTITUTE AND AMERICAN

RIVERS, INC., OR THEIR SUCCESSORS;

(III) PROVIDES AN ADEQUATE WATER FLOW FOR PROTECTION OF AQUATIC LIFE AND FOR SAFE AND EFFECTIVE FISH PASSAGE;

(IV) PROTECTS AGAINST EROSION; AND

(V) PROTECTS CULTURAL AND HISTORIC RESOURCES.

(B) BIOMASS.--THE TERM "BIOMASS ENERGY" AS DEFINED UNDER SECTION 2 OF THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT SHALL ALSO INCLUDE THE GENERATION OF ELECTRICITY UTILIZING BY-PRODUCTS OF THE PULPING PROCESS AND WOOD MANUFACTURING PROCESS, INCLUDING BARK, WOOD CHIPS, SAWDUST AND LIGNINS IN SPENT PULPING LIQUORS. ELECTRICITY FROM BIOMASS ENERGY UNDER THIS SUBSECTION GENERATED INSIDE THIS COMMONWEALTH SHALL BE ELIGIBLE AS A TIER I ALTERNATIVE ENERGY SOURCE. ELECTRICITY FROM BIOMASS ENERGY UNDER THIS SUBSECTION GENERATED OUTSIDE THIS COMMONWEALTH SHALL BE ELIGIBLE AS A TIER II ALTERNATIVE ENERGY SOURCE.

(C) INCREASE IN TIER I.--THE COMMISSION SHALL AT LEAST QUARTERLY INCREASE THE PERCENTAGE SHARE OF TIER I ALTERNATIVE ENERGY SOURCES REQUIRED TO BE SOLD BY AN ELECTRIC DISTRIBUTION COMPANY OR ELECTRIC GENERATION SUPPLIER UNDER SECTION 3(B)(1) OF THE ALTERNATIVE ENERGY PORTFOLIO STANDARDS ACT TO REFLECT ANY NEW BIOMASS ENERGY OR LOW-IMPACT HYDROPOWER RESOURCES THAT QUALIFY AS A TIER I ALTERNATIVE ENERGY SOURCE UNDER THIS SECTION. NO NEW RESOURCE QUALIFYING AS BIOMASS ENERGY OR LOW-IMPACT HYDROPOWER UNDER THIS SECTION SHALL BE ELIGIBLE TO

GENERATE TIER I ALTERNATIVE ENERGY CREDITS UNTIL THE COMMISSION HAS INCREASED THE PERCENTAGE SHARE OF TIER I TO REFLECT THESE ADDITIONAL RESOURCES.

§ 2815. CARBON DIOXIDE SEQUESTRATION NETWORK.

(A) ASSESSMENT.--

(1) BY APRIL 1, 2009, THE DEPARTMENT SHALL COMPLETE A

STUDY TO IDENTIFY SUITABLE GEOLOGICAL FORMATIONS, INCLUDING SITES WITHIN OR IN PROXIMITY TO THE MEDINA, TUSCARORA OR ORISKANY SANDSTONE FORMATION FOR THE LOCATION OF A STATE NETWORK.

(2) BY JUNE 1, 2009, THE DEPARTMENT, IN CONSULTATION WITH THE COMMISSION, SHALL HIRE ONE OR MORE INDEPENDENT EXPERTS PURSUANT TO 62 PA.C.S. PT. I (RELATING TO COMMONWEALTH PROCUREMENT CODE), AS NECESSARY, TO CONDUCT AN ASSESSMENT OF THE FOLLOWING:

(I) ESTIMATES OF CAPITAL REQUIREMENTS AND EXPENDITURES NECESSARY FOR THE ESTABLISHMENT, OPERATION AND MAINTENANCE OF A STATE NETWORK.

(II) THE COLLECTION OF DATA TO ALLOW A SAFETY ASSESSMENT.

(III) AN ASSESSMENT OF ALL POTENTIAL RISK TO INDIVIDUALS, PROPERTY AND THE ENVIRONMENT ASSOCIATED WITH THE GEOLOGICAL SEQUESTRATION OF CARBON DIOXIDE IN A STATE NETWORK. THE ASSESSMENT, WHICH SHALL BE COMPLETED BY OCTOBER 1, 2009, SHALL INCLUDE AN ANALYSIS OF THE FOLLOWING:

(A) EXISTING FEDERAL AND STATE REGULATORY STANDARDS FOR THE STORAGE OF CARBON DIOXIDE.

(B) FACTORS CONTAINED IN THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY'S VULNERABILITY EVALUATION FRAMEWORK FOR GEOLOGIC SEQUESTRATION OF CARBON DIOXIDE (EPA 430-R-08-009, DATED JULY 10, 2008).

(C) THE DIFFERENT TYPES OF INSURANCE, BONDS, OTHER INSTRUMENTS AND RECOMMENDED LEVELS OF INSURANCE WHICH SHOULD BE CARRIED BY THE OPERATOR OF THE STATE

NETWORK DURING THE CONSTRUCTION AND OPERATION OF THE STATE NETWORK.

(D) THE AVAILABILITY OF COMMERCIAL INSURANCE.

(E) MODELS FOR THE ESTABLISHMENT OF A COMMONWEALTH FUND TO PROVIDE PROTECTION AGAINST RISK TO BE FUNDED BY THE OPERATOR.

(B) TRANSMISSION OF STUDY AND ASSESSMENT.--

(1) THE DEPARTMENT SHALL SUBMIT THE STUDY CONDUCTED UNDER SUBSECTION (A)(1) TO THE GOVERNOR, THE CHAIRMAN AND MINORITY CHAIRMAN OF THE ENVIRONMENTAL RESOURCES AND ENERGY COMMITTEE OF THE SENATE, THE CHAIRMAN AND MINORITY CHAIRMAN OF THE ENVIRONMENTAL RESOURCES AND ENERGY COMMITTEE OF THE HOUSE OF REPRESENTATIVES AND THE DEPARTMENT NO LATER THAN MAY 1, 2009.

(2) THE INDEPENDENT EXPERT SHALL SUBMIT THE FINAL ASSESSMENT UNDER SUBSECTION (A)(2) TO THE GOVERNOR, THE CHAIRMAN AND MINORITY CHAIRMAN OF THE ENVIRONMENTAL RESOURCES AND ENERGY COMMITTEE OF THE SENATE, THE CHAIRMAN AND MINORITY CHAIRMAN OF THE ENVIRONMENTAL RESOURCES AND ENERGY COMMITTEE OF THE HOUSE OF REPRESENTATIVES AND THE DEPARTMENT NO LATER THAN NOVEMBER 1, 2009.

(C) DEPARTMENT.--THE FOLLOWING SHALL APPLY:

(1) THE DEPARTMENT SHALL REVIEW THE ASSESSMENT SUBMITTED UNDER SUBSECTION (A)(2) AND ALL GEOLOGIC SEQUESTRATION REQUIREMENTS ASSOCIATED WITH A STATE NETWORK, INCLUDING GEOLOGICAL SITE CHARACTERIZATION, MODELING AND VERIFICATION OF FLUID MOVEMENT, CORRECTIVE ACTION, WELL CONSTRUCTION, OPERATION, MECHANICAL INTEGRITY TESTING, MONITORING AND SITE CLOSURE.

(2) FOLLOWING THE REVIEW UNDER PARAGRAPH (1), THE

DEPARTMENT MAY CONDUCT A PILOT PROJECT TO DETERMINE THE VIABILITY OF ESTABLISHING A STATE NETWORK IN THIS COMMONWEALTH.

(D) DEFINITIONS.--AS USED IN THIS SECTION, THE FOLLOWING WORDS AND PHRASES SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SUBSECTION:

"CARBON DIOXIDE SEQUESTRATION." THE STORAGE OF CARBON DIOXIDE IN A SUPERCRITICAL PHASE WITHIN A GEOLOGICAL SUBSURFACE FORMATION SUCH AS A DEEP SALINE AQUIFER WITH SUITABLE CAP ROCK, SEALING FAULTS AND ANTICLINES THAT INCLUDES COMPRESSION, DEHYDRATION AND LEAK DETECTION MONITORING EQUIPMENT AND PIPELINES TO TRANSPORT CARBON DIOXIDE CAPTURED BY AN ADVANCED COAL COMBUSTION WITH LIMITED CARBON EMISSIONS PLANT TO AN UNDERGROUND STORAGE SITE. THE TERM SHALL NOT INCLUDE USE OF THE CARBON DIOXIDE FOR ENHANCED OIL RECOVERY.

"DEPARTMENT." THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES OF THE COMMONWEALTH.

"STATE NETWORK." A CARBON DIOXIDE SEQUESTRATION NETWORK ESTABLISHED ON LANDS OWNED BY THE COMMONWEALTH, OR LANDS ON WHICH THE COMMONWEALTH HAS ACQUIRED THE RIGHT TO STORE CARBON DIOXIDE, THAT HAVE BEEN DESIGNATED BY THE DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES FOR THE STORAGE OF CARBON DIOXIDE.

SECTION 6. THIS ACT SHALL TAKE EFFECT IN 30 DAYS.

Appendix M

Cohen	Hickernell	Oliver	Swanger
Conklin	Hornaman	Pallone	Tangretti
Costa	Hutchinson	Parker	Taylor, J.
Cox	James	Pashinski	Taylor, R.
Creighton	Josephs	Payne	Thomas
Cruz	Kauffman	Payton	True
Curry	Keller, M.	Peifer	Turzai
Cutler	Keller, W.	Perry	Vereb
Daley	Kenney	Petrarca	Vitali
Dally	Kessler	Petri	Vulakovich
DeLuca	Killion	Petrone	Wagner
Denlinger	King	Phillips	Walko
DePasquale	Kirkland	Pickett	Wansacz
Dermody	Kortz	Preston	Waters
DeWeese	Kotik	Pyle	Watson
DiGirolamo	Kula	Quigley	Wheatley
Donatucci	Leach	Quinn	White
Eachus	Lentz	Ramaley	Williams
Ellis	Levdansky	Rapp	Wojnaroski
Evans, D.	Longietti	Raymond	Yewcic
Evans, J.	Mackereth	Readshaw	Youngblood
Everett	Maher	Reed	Yudichak
Fabrizio	Mahoney	Reichley	
Fairchild	Major	Roae	O'Brien, D.,
Fleck	Manderino	Rock	Speaker
Frankel	Mann	Roebuck	

NAYS–0

NOT VOTING–0

EXCUSED–2

Perzel	Shimkus

The majority having voted in the affirmative, the question was determined in the affirmative and the resolution was adopted.

SUPPLEMENTAL CALENDAR B

BILL ON SECOND CONSIDERATION

The House proceeded to second consideration of **HB 2200, PN 3176,** entitled:

An Act amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, further providing for definitions; and providing for adoption of energy efficiency and demand-side response.

On the question,
Will the House agree to the bill on second consideration?

Mr. **FREEMAN** offered the following amendment No. **A05751:**

Amend Sec. 2 (Sec. 2806.1), page 4, lines 7 and 8, by striking out "in whose service territory the programs are implemented." and inserting

from all sources, including default service generation revenues as of January 1, 2007.

Amend Sec. 2 (Sec. 2806.1), page 9, by inserting between lines 3 and 4

(i) By May 31, 2011, total annual deliveries to retail customers of electric distribution companies shall be reduced by a minimum of 1%. This load reduction shall be measured against the expected load forecasted by the commission for June 1, 2010, through May 31, 2011, based on load for the period June 1, 2007, through May 31, 2008, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve. The commission shall determine and make public the forecasts to be used for each electric distribution company no later than August 31, 2008. The program administrator shall ensure that a third-party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company.

Amend Sec. 2 (Sec. 2806.1), page 9, line 4, by striking out "(i)" and inserting

(ii)

Amend Sec. 2 (Sec. 2806.1), page 9, line 6, by inserting a period after "2.5%"

Amend Sec. 2 (Sec. 2806.1), page 9, lines 6 through 8, by striking out ", WITH PROVISIONS MADE FOR" in line 6, all of line 7 and "ELECTRIC DISTRIBUTION COMPANY MUST SERVE." in line 8

Amend Sec. 2 (Sec. 2806.1), page 9, line 12, by inserting after "2008"

, with provision made for weather adjustments and extraordinary load that the electric distribution company must serve

Amend Sec. 2 (Sec. 2806.1), page 9, line 20, by striking out "(ii)" and inserting

(iii)

Amend Sec. 2 (Sec. 2806.1), page 9, line 28, by striking out "(iii)" and inserting

(iv)

On the question,
Will the House agree to the amendment?

The SPEAKER. The Chair recognizes Representative Freeman on the amendment.

Mr. FREEMAN. Thank you, Mr. Speaker.

Mr. Speaker, this amendment does a number of things. First, it adds clarifying language dealing with the 2-percent cost cap that is currently contained in the legislation. It would add generation to the list of items that go into calculating the final figure. Currently it only deals with transmission and distribution, but we add generation, and generation makes up roughly 60 percent of the revenues of a public utility. So it is important to put generation in to make sure that we have a higher figure to work off of.

Second, we add an incremental figure of 1 percent. Currently in the bill the goal, or target goal, is going to be 2.5 percent, in terms of target, of making demand go down by 2013, and we have an interim goal of 1 percent that would kick in in 2011, and that is important to provide for in this legislation as a means of expediting the efforts on the part of the electric utility companies to put in place their efforts to reduce demand and to make conservation a real priority.

And third, we provide language in this amendment to deal with the issue of adjusting the figure, the load figure, based on weather conditions and the like, those kinds of extraordinary factors that are beyond the control of the utility company, in order to take that into consideration.

I would urge a "yes" vote on this amendment.

The SPEAKER. Representative Ross, on the amendment.

Mr. ROSS. Thank you, Mr. Speaker.

I believe this is a good amendment, and I intend to support it.

The SPEAKER. Representative McCall.

Mr. McCALL. Thank you, Madam Speaker – Mr. Speaker.

The SPEAKER. The Chair will remind the gentleman to be judicious in his comments.

Mr. McCALL. I was referring to Sue, Mr. Speaker.

Mr. Speaker, I would also ask for an affirmative vote on the Freeman amendment.

It does a number of things, but more importantly, it accelerates the energy efficiency goals as set in HB 2200 and implements that 1-percent reduction by 2011, and I think what that does, it ensures that the implementation of the 2.5 goal, that they can in fact meet that goal and we could benchmark that early on in 2011 to see that they are well on their way to implementation of the 2 1/2-percent conservation goal as set in HB 2200.

But I think, more importantly, that it can in fact help customers mitigate rate increases as they come off in 2010 by having the conservation measure of 1 percent implemented before those caps come off, and I would ask for an affirmative vote on the Freeman amendment.

The SPEAKER. Representative Bud George.

Mr. GEORGE. Mr. Speaker, I would echo the sentiments of the gentleman, Mr. McCall. It would seem, and hopefully I am right, that the big wall has gone down and we are about to pursue what those of us on both sides of the aisle feel is most necessary in regard to conservation, in regard to controlling the spiraling of electric rates, and I would urge the passage of this amendment.

Thank you.

On the question recurring,

Will the House agree to the amendment?

The following roll call was recorded:

YEAS–198

Adolph	Frankel	Manderino	Rohrer
Argall	Freeman	Mann	Ross
Baker	Gabig	Mantz	Rubley
Barrar	Galloway	Markosek	Sabatina
Bastian	Geist	Marshall	Sainato
Bear	George	Marsico	Samuelson
Belfanti	Gerber	McCall	Santoni
Benninghoff	Gergely	McGeehan	Saylor
Bennington	Gibbons	McI. Smith	Scavello
Beyer	Gillespie	McIlhattan	Schroder
Biancucci	Gingrich	Melio	Seip
Bishop	Godshall	Mensch	Shapiro
Blackwell	Goodman	Micozzie	Siptroth
Boback	Grell	Millard	Smith, K.
Boyd	Grucela	Miller	Smith, M.
Brennan	Haluska	Milne	Smith, S.
Brooks	Hanna	Moul	Solobay
Buxton	Harhai	Moyer	Sonney
Caltagirone	Harhart	Mundy	Staback
Cappelli	Harkins	Murt	Stairs
Carroll	Harper	Mustio	Steil
Casorio	Harris	Myers	Stern
Causer	Helm	Nailor	Stevenson
Civera	Hennessey	Nickol	Sturla
Clymer	Hershey	O'Brien, M.	Surra
Cohen	Hess	O'Neill	Swanger
Conklin	Hickernell	Oliver	Tangretti
Costa	Hornaman	Pallone	Taylor, J.
Cox	Hutchinson	Parker	Taylor, R.
Creighton	James	Pashinski	Thomas
Cruz	Josephs	Payton	True
Curry	Kauffman	Peifer	Turzai
Cutler	Keller, M.	Petrarca	Vereb
Daley	Keller, W.	Petri	Vitali
Dally	Kenney	Petrone	Vulakovich
DeLuca	Kessler	Phillips	Wagner
Denlinger	Killion	Pickett	Walko
DePasquale	King	Preston	Wansacz
Dermody	Kirkland	Pyle	Waters
DeWeese	Kortz	Quigley	Watson
DiGirolamo	Kotik	Quinn	Wheatley
Donatucci	Kula	Ramaley	White
Eachus	Leach	Rapp	Williams
Ellis	Lentz	Raymond	Wojnaroski
Evans, D.	Levdansky	Readshaw	Yewcic
Evans, J.	Longietti	Reed	Youngblood
Everett	Mackereth	Reichley	Yudichak
Fabrizio	Maher	Roae	
Fairchild	Mahoney	Rock	O'Brien, D.,
Fleck	Major	Roebuck	Speaker

NAYS–3

Metcalfe	Payne	Perry

NOT VOTING–0

EXCUSED–2

Perzel	Shimkus

The majority having voted in the affirmative, the question was determined in the affirmative and the amendment was agreed to.

On the question,

Will the House agree to the bill on second consideration as amended?

Mr. **FREEMAN** offered the following amendment No. **A05807:**

Amend Title, page 1, line 2, by striking out "and"

Amend Title, page 1, line 4, by removing the period after "response" and inserting

; and further providing for duties of electric distribution companies.

Amend Sec. 1 (Sec. 2803), page 3, line 3, by striking out all of said line and inserting

"Real-time price." A rate that directly reflects the different cost of energy during each hour.

* * *

"Smart meter technology." Technology, including, but not limited to, metering technology and network communications technology capable of bidirectional communication and that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. The technology shall provide customers with direct access to and use of price and consumption information. The technology shall also:

(1) Directly provide customers with information on their hourly consumption.

(2) Enable time-of-use rates and real-time price programs.

(3) Effectively support the automatic control of the customer's electricity consumption by one or more of the following as selected by the customer:

(i) the customer;

(ii) the customer's utility; or

(iii) a third party engaged by the customer or the customer's utility.

"Time-of-use rate." A rate that reflects the costs of serving customers during different time periods, including off-peak and on-peak periods, but not as frequently as each hour.

Amend Bill, page 13, by inserting between lines 22 and 23

Section 3. Section 2807(e) of Title 66 is amended by adding a paragraph to read:

§ 2807. Duties of electric distribution companies.

* * *

(e) Obligation to serve.–* * *

(6) (i) Within nine months after the effective date of this paragraph, electric distribution companies shall file a smart meter technology procurement and installation plan with the commission for approval and make the plan available for public comment for a minimum of 30 days. The plan shall describe the smart meter technologies the electric distribution company proposes to install, how the smart meter technology meets the requirements of this paragraph and how the smart meter technology shall be installed according to this paragraph. In addition, the plan shall ensure that all smart meter technology installation and maintenance work shall be performed by adequately trained and qualified personnel and that, to the extent practical, such work shall be offered initially to employees of the electric distribution company.

(ii) Electric distribution companies shall furnish smart meter technology to:

(A) Customers responsible for 40% of the distribution company's annual peak demand within four years after the effective date of this paragraph.

(B) Customers responsible for 75% of the distribution company's annual peak demand within six years after the effective date of this paragraph.

(C) One hundred percent of its customers within ten years after the effective date of this paragraph.

Electric distribution companies shall, with customer consent, make available electronic access to customer meter data to third parties, including electric generation suppliers and providers of conservation and load management services.

(iii) Electric distribution companies shall be permitted to recover all reasonable and prudent costs, as determined by the commission, of providing smart meter technology, including annual deprecation and capital costs over the life of the smart meter technology, that are incurred after the effective date of this paragraph, less all operating and capital costs savings realized by the electric distribution company from the introduction and use of the smart meter technology. An electric distribution company may, at its option, recover such smart meter technology costs:

(A) through base rates, including a deferral for future base rate recovery of current costs, with carrying charges equal to 6%; or

(B) on a full and current basis through a reconcilable automatic adjustment clause under section 1307 (relating to sliding scale of rates; adjustments).

In no event shall lost or decreased revenues by an electric distribution company due to reduced electricity consumption or shifting energy demand be considered a cost of smart meter technology. Smart meter technology shall be deemed to be a new service offered for the first time under section 2804(4)(vi) (relating to standards for restructuring of electric industry).

(iv) By January 1, 2010, or at the end of the applicable generation rate cap period, whichever is later, a default service provider shall submit to the commission one or more proposed time-of-use rates and a real-time price plan. The commission shall approve or modify the time-of-use rates and real-time price plan within six months of submittal. The default service provider shall offer commission-approved time-of-use rates and a real-time price plan to all residential and commercial customers that have been provided with smart meter technology within 60 days of installation of the smart meter technology or commission approval of the time-of-use rates and a real-time price plan, whichever is later. Customer participation in time-of-use rates or real-time pricing shall be voluntary and shall only be provided with the affirmative consent of the customer. The default service provider shall submit an annual report to the commission on the participation in the time-of-use and real-time price programs and the efficacy of the programs in affecting energy demand and consumption and the effect on wholesale market prices.

(v) For purposes of this paragraph, the term "electric distribution company" shall mean a public utility providing facilities for the jurisdictional transmission and distribution of electricity to 100,000 or more retail customers in this Commonwealth.

Amend Sec. 3, page 13, line 23, by striking out "3" and inserting
4

On the question,
Will the House agree to the amendment?

The SPEAKER. The Chair recognizes Representative Freeman on the amendment.

Mr. FREEMAN. Thank you, Mr. Speaker.

Mr. Speaker, this amendment would require that all public utilities, electric utilities, install smart meters for residential and business customers across the Commonwealth. Smart meters are a very important technology which is available to us, which would save both customers and utilities a considerable amount of money by allowing the customer to be able to opt in – and it is optional – in to a purchasing process where they could purchase their electricity at off-peak hours, thereby saving on cost.

Currently the electric rate that all of us receive as utility customers is an averaging of peak-hour costs, which are high, and off-peak-hour costs, which are low. With smart meters, which are a bidirectional mechanism to let both the utility know when electricity is being used and also the customer, the customer has the option of being able to purchase their electricity at off-peak periods at considerable savings to them in terms of their electric utility bill.

In terms of the provision of the amendment, the utility companies would be required to file procurement plans with the PUC (Public Utility Commission), I believe within a 9-month period. They would have to provide for the installation of these meters by people who have been trained, giving the current employees of those utility companies the opportunity to do that work. There would be a phase-in of the smart meters over a 10-year period – 40 percent in the first 4 years, 75 percent in the 6-year period, with 100 percent at the end of the 10-year period.

Obviously, a utility company would be able to recover their costs for the installation of these meters, but only their net cost,

and there is a tremendous savings to the utility company. In fact, when PPL, which is one of the utility companies that actually has installed smart meters, installed their meters, it was their belief that the meters actually paid for themselves. So there was little cost to be passed on to the utility customer.

I should note, too, that the customers will not be billed for the smart meter. It becomes part of the rate base and one that the utility company would have to file for, but it is important to note that there are savings both for the utility customer as well as for the utility company.

Within this amendment is the time-of-use plan, which I mentioned or referred to earlier. The customer would be able to purchase their electricity at off-peak periods, and that is important. That is a cheaper period of time in which to get your electricity. So there are quite a bit of savings that can be realized by the consumer by using the smart meter technology and opting in to that plan.

Smart meters are already used in a number of sections of the State. As I mentioned, PPL has installed smart meters at a considerable savings to their customers as well as to the utility company. Smart meters allow customers, as I mentioned, to voluntarily sign up for that optional plan to buy their electricity at off-peak periods, and it has been shown that if only 1 percent of utility customers were to use the smart meter technology to reduce their cost of electricity, it could mean a savings of 10 percent overall for all utility customers.

Smart meters also benefit the utility company in providing for better knowledge as to blackouts, as to thefts, as to being able to address and cut down on consumer complaints. Smart meters truly are a win-win proposition for the utility customers here in Pennsylvania and also for those who generate the electricity because it will save them on the amount of money that needs to go in to creating new generating facilities and transmission lines.

I would urge a "yes" vote for this conservation measure.

The SPEAKER. Representative Pyle, on the amendment.

Mr. PYLE. Will the maker of the amendment please answer a few questions?

The SPEAKER. The gentleman, Representative Freeman, indicates he will stand for interrogation. Representative Pyle is in order and may proceed.

Mr. PYLE. Thank you, Mr. Speaker.

Mr. Speaker, I am having trouble here understanding this bidirectional communication ability. What vehicle might be used to enable this communication?

Mr. FREEMAN. The smart meter.

Mr. PYLE. The smart meter has to connect to something for the EDC (electric distribution company) to read usage. I am asking, what is the vehicle for communication?

Mr. FREEMAN. I am sorry. I am having trouble following the gentleman's line of questioning.

Mr. PYLE. I am asking if Internet access is essential to make this idea work.

Mr. FREEMAN. I do not believe it is, if I recall my readings of the smart meter technology.

Mr. PYLE. Could the gentleman please fill me in on how this meter is going to be hooked up to an electric company? By the wording in your bill, it says it can kind of step in and monitor day usage, time-of-day usage, et cetera?

Mr. FREEMAN. Correct.

Mr. PYLE. That is the part I am curious about, Mr. Speaker.

Mr. FREEMAN. Well, the meter, as is true of any meter, reads your usage of electricity, and with smart meters, you are able to read both peak and off-peak periods. The generation of electricity is cheaper in an off-peak period. So there is the opportunity for the utility customer, the consumer, to be able to purchase that electricity at an off-peak period of time, and that would be noted through the smart meter, saving the utility customer, the consumer, considerable dollars.

Mr. PYLE. Another question, Mr. Speaker. I am curious about section (3) here, "Effectively support the automatic control of the customer's electricity consumption by one or more of the following…." I am looking at section (ii), "the customer's utility…." In any way does that have any bearing on the electric customer's ability to use electricity as they see fit?

Mr. FREEMAN. No, not in any way, Mr. Speaker.

Mr. PYLE. Is there a potential for the EDC, the electric distribution company, to effect a rolling blackout by readings on these smart meters?

Mr. FREEMAN. Could you add clarity to that question? I am not quite sure where you are going with it.

Mr. PYLE. What I am asking is, is there a potential utilizing these smart meters and customers' electrical usage for the electric distribution company to choose to selectively route electricity to areas showing peak and off-peak usage?

Mr. FREEMAN. No. Keep in mind that opting in to this program is an optional opportunity for customers, and they would not be able to selectively pick certain customers to be blacked out versus others.

It should be noted, too, that, if anything, this technology actually will reduce the possibility of blackouts and brownouts, because if you reduce the amount of electricity that is demanded at peak times, you limit or reduce the possibility of blackouts. One of the problems with our system now is that when we hit a peak time, particularly in the hottest days of the year, you have the system being overloaded. If you can shift some of that use to nonpeak periods, or off-peak periods, rather, you save considerably in terms of money for the consumer but you also save in the amount of money the utility company has to expend in purchasing far more expensive energy at peak times. So it is a win-win for both the customer and the utility, but in addition to that, you also reduce the possibility of blackouts and brownouts because you have already incentivized the shifting to nonpeak periods, which will reduce the potential of overstraining the system.

Mr. PYLE. What is confusing me, Mr. Speaker, is the wording that says, and I quote, "Effectively support the automatic control of the customer's electricity consumption by one or more of the following...: the customer;" – which I am all right with – "the customer's utility...." Is there a potential, is what I am asking, for the customer's utility to exercise automatic control over the amount of electricity a customer may purchase?

Mr. FREEMAN. I would direct the gentleman's attention, Mr. Speaker, to the word "support" that appears on line 23. It is to support in that effort. It is not to wrest control from the consumer.

Mr. PYLE. Sorry; automatic control is what is throwing me off here.

Mr. FREEMAN. Again, I would direct the gentleman's attention to the word "support." Keep in mind, it is a bidirectional system, so there is information being transmitted to the utility as well as to the customer.

Mr. PYLE. Thank you, Mr. Speaker.

The SPEAKER. Representative Hutchinson, on the amendment.

Mr. HUTCHINSON. Thank you, Mr. Speaker.

I rise in opposition to this amendment.

Mr. Speaker, I think that this amendment makes absolutely no common sense at this time. The consumers of Pennsylvania are about to experience an increase in the electricity costs over the next couple of years because rate caps will be phasing out in various areas over the next 2 or 3 years, and with that, consumers are going to see their electric rates increased. By passing this amendment, we are going to be piling on the consumers because they will be mandated, although in an indirect way, they will be mandated to pay for these new meters to be installed in their home whether they save on their electric costs or not.

It only makes sense to say smart meters should go to consumers who can save money by installing them. Those who can save by having a smart meter, it would make sense for them to have smart meters in their home. Mandating it across the board mandates that everybody pays whether they save or not, and that just does not make sense.

I am very concerned that we continue to ignore the consumers by making more mandates and increasing their costs, whether it is through mandating the meters, through trying to have some kind of a surcharge, all these things at a time when their electric costs are going up anyways.

So although on a case-by-case basis, smart meters might be a good thing to do, making a 100-percent mandate does not make sense. So I am opposing this amendment.

Thank you, Mr. Speaker.

The SPEAKER. Representative Godshall, on the amendment.

Mr. GODSHALL. I would like to interrogate the maker of the amendment, please.

The SPEAKER. Representative Freeman indicates he will stand for interrogation. Representative Godshall is in order and may proceed.

Mr. GODSHALL. Thank you, Mr. Speaker.

On these smart meters, I understand that PPL has smart meters installed already in their service area. Is that correct?

Mr. FREEMAN. That is correct, Mr. Speaker.

Mr. GODSHALL. Is that in their full service area?

Mr. FREEMAN. To the best of my knowledge, it is.

Mr. GODSHALL. I questioned in our caucus this morning. I am in a PPL service area. If I have a smart meter installed, I do not know it. I have not been told that, nor do I have any idea what it is doing to save me energy. I do not know.

Mr. FREEMAN. I should note that PPL did install smart meters. They would need to upgrade that technology that they installed to make it bidirectional. The benefits being realized by smart meters in the PPL service area really are to the utility at this point, because it allows them to better track theft, to track blackouts, to track out shortages, anything that they could respond to more quickly, which also helps them in terms of their cost savings and cutting down on consumer complaints. At this point in time, they do not offer the optional requirement that we are putting in with this amendment, which would allow the consumer to be able to pick and choose their off-peak periods, if they so choose, in order to run their dishwasher or their laundry to save in terms of their electric utility costs.

So the technology is there in the PPL territory. It needs a slight upgrade to be able to be bidirectional, but the benefits from the utility standpoint of being able to be better on top of blackouts, thefts, shortages is already being accrued to the utility. What we would be able to do with this is to ensure that the customer will now have the option of buying their electricity at off-peak periods and thereby saving considerable dollars.

Mr. GODSHALL. So at this point the benefit of the smart meter supposedly that is on my home is benefiting the company, and I am still not sure how that— I have no knowledge as far as turning this appliance off or buying my electric at whatever. If it is there, it is of little use, and if there is going to be any conservation, it would be on my part, not on the company's part.

Mr. FREEMAN. Keep in mind again, Mr. Speaker, that when PPL—

Mr. GODSHALL. Mr. Speaker, I am having trouble hearing. Just one second.

I am sorry.

Mr. FREEMAN. That is okay.

Mr. Speaker, the meters as installed by the PPL utility really are for the benefit of the company in their current configuration. With this amendment, we would be able to realize the benefits for the consumer as well.

The company understood that this technology was a cost savings for them, because again, they could capture blackouts, they could capture shortages, they could capture cases of theft through this technology. It will require on the part of PPL somewhat of an upgrade in order to be able to realize a bidirectional reporting system, but in doing so, we then afford to the consumer the option of saving money by being able to purchase their electricity at cheaper off-peak periods as opposed to the current system where they are stuck with the averaging out, which is a much higher rate than an off-peak period.

Mr. GODSHALL. As of right now, I believe, in going to PJM (Pennsylvania-Jersey-Maryland Interconnection), you know, they look at the peak demand, and everybody is really charged the same rate when PPL or PECO or whoever is buying electric. It is based on the last amount of energy needed coming in to PJM before it goes out. I still do not understand how that is going to relate to each individual household, you know, when you are talking about millions of households in the system.

And the costs, we had a cost, I believe, from the PUC of $1.2 billion or $1.3 billion to install these around in the State of Pennsylvania, and I do not know if that has taken off because PPL has them already, and you know, if they are in place or not, I have no idea. But I am not sure how each individual home is going to be able to purchase based on the way our electric is being distributed today and the various companies charge, the distribution companies charge for that electric by the PJM, who distributes the electric.

Mr. FREEMAN. Just for the members' information, Mr. Speaker, I would point to the fact that PPL, by their own estimates, has stated that they believe that the cost of installation has paid for itself in terms of the savings that the company has realized, which is good news for the consumer if this becomes a statewide program.

The other factor to be kept in mind, too, is that even if only 1 percent, only 1 percent of all utility customers, all consumers, utilize smart meter technology by purchasing their power at off-peak hours, that reduces dramatically the amount of demand on peak-hour periods of generation. Bringing that number down can result in a 10-percent savings for all utility customers,

whether they use the smart meter technology or not, and the reason for that is the fact that if you can reduce the peak-hour demand, you reduce the period of time when any utility company is forced to buy the most expensive amount of energy. It is at peak periods that energy costs the most. You bring that demand down in those peak periods and you have a cost savings for both the utility company and the consumer. So even just 1 percent of utility customers utilizing smart meter technology, purchasing their electricity at off-peak hours, will result in a 10-percent savings for everyone.

Mr. GODSHALL. Do you have any idea how many people – are there any projections based on how many people would actually use this? Have there been any kind of test markets done showing how many people are going to use this technology and how many people are going to be sitting up there watching this meter on their computer or whatever?

Mr. FREEMAN. Well, there are a couple of factors to be kept in mind, Mr. Speaker, in that regard. One is the fact that a statewide poll that was conducted last year showed that 67 percent of registered Democrats and 62 percent of registered Republicans support smart meter technology and have expressed their support for the concept.

In terms of usage, obviously there has got to become a greater awareness on the part of the consumer that they have this option, and that will become part of the process as the utilities move forward with their procurement plans.

I do recall an article I came across – I do not have it with me on the floor today – but an article that I came across where smart meter technology was utilized in the Province of Ontario in Canada, and it has met with a great response on the part of customers. They have voluntarily bought into the optional plan. They are saving money and energy demand at peak periods is dropping. So at least in the case of Ontario, there shows a real response to it, and I think given the nature of our consumer-oriented society where in the last 10 to 15 years in particular, we have given more and more options of choice to consumers in an array of different utility service areas, it only makes common sense to be able to give them this choice, to give the consumer the opportunity to be able to purchase their power at a cheaper rate. In particular, when you are dealing with those very mundane household chores like doing laundry or washing the dishes in a dishwasher, why run those activities during a period of peak hour when you can save money in an off-peak period?

I would also note, and you will see this in the amendment, there is the option to the consumer of getting the services of a third party so that that third party can guarantee, through the consumer's consent, the ability of purchasing the power through a computer-programmed period. There is no need for the consumer to have to keep watching when the peak hour and off-peak hour is. They could actually purchase that service and have that third party make sure that the purchase of electricity occurs in an off-peak period for whatever the consumer wants that electricity purchased for.

So there are a lot of options that we lay out with this amendment that will benefit the consumer, reduce their utility bill, and save money for both the utility company and definitely for the customer themselves.

Mr. GODSHALL. In this case are we not taking the choice away from the consumer by saying you have to put this in service in your district rather than you may or you have a choice? Are we not saying that you must do it? We are taking that choice away from the consumer, I believe, and I would have no problem with this if we do it on a choice basis, as you used the word "choice" before. We are taking that choice away.

Mr. FREEMAN. Well, I would only point out, Mr. Speaker, that we are requiring the utility company to install the meter, not the customer, and it is the utility company. If we are going to see the kind of cost savings that will reduce the price of electricity for consumers throughout the State, it has got to be done on a statewide basis by the utility companies. To do it piecemeal really would not result in a lot of savings to the individual customer, but if we do it statewide, the economies of scale begin to kick in and you see a savings statewide to all customers.

And as I mentioned before, a very important statistic, if just 1 percent, just 1 percent of utility customers decide that they want to utilize this technology, everyone saves a minimum of 10 percent because peak-hour demand goes down, and that is the most expensive time to purchase electricity both for a utility company and for a customer. So there is a savings for everyone, and they have the choice to either opt in to those smart meters or to not opt in, but at least through this process, we can guarantee that through the economies of scale, that will be there and the savings can be realized by all customers across the Commonwealth.

Mr. GODSHALL. Thank you, Mr. Speaker.

That concludes my interrogation. I would like to make a few comments.

The SPEAKER. The gentleman is in order and may proceed.

Mr. GODSHALL. In looking at this, I totally agree with the gentleman that we need to conserve energy, we need to save energy. I totally agree that smart meters are a big step in doing this. What I am not in full agreement on in any way is that everyone is mandated to, whether they intend to use it or not, whether they know how to use it or not, everyone is mandated, under this legislation, to go ahead with the smart meter technology.

And again, the gentleman mentioned there were polls taken. If there is a poll taken and said, do you believe in the use of smart meters, my answer to that would be yes. I would have absolutely no problem in answering yes, but then if there was a question at the bottom that says you are going to be paying $300 for the installation through your utility bill for this meter and the software that goes with it, I am not sure what the answer would be.

And the other thing I am not quite certain of is why we are addressing this in HB 2200 when the smart meter technology part of it is in HB 2201, which remains in committee. We did not move that out of committee as of 2 weeks ago, I believe it was. It is still there, and the smart meter part of the discussion that we are doing today on the smart meters is in HB 2201, which remains in the Consumer Affairs Committee.

As I said, I agree with the bulk of what the gentleman says. I agree we have got to conserve. I agree on everything else he said, but I am just totally not in agreement that somebody who has no intention of using this technology should be assessed by the utility companies approximately, until it is finished, at least $300 to get this in place in his residence and he is going to be paying for it. It is going to be paid for by the consumer whether they use it or not.

So anyway, those are my feelings on the bill, and you have to vote accordingly.

The SPEAKER. Representative Ross.

Mr. ROSS. Thank you, Mr. Speaker.

I think that we have gotten engaged in a very technical discussion about the particular technology here, but underneath this, there is a larger issue, and that is that regardless of what we do here today, the Public Utility Commission is moving us toward real-time pricing, real-time pricing basically reflecting the actual demands and costs at any particular time in the day. In order to be able to react to that, we will need technology sufficient to help customers understand and save money on their usage.

It is inherent in the discussion that we ultimately get this technology one way or another. We can dispute about whether this is the best way to go at getting that technology deployed, whether a voluntary or incentive-based program might be better, but ultimately we will need, in order to save money for our customers and reduce peak demand and achieve our goals in that regard, we will need some form of technology that will enable communications with devices within the house and enable us to manage our electric usage in real time in a better way.

So although I recognize some valid points by some of my colleagues here, Mr. Speaker, I will personally be voting in favor of this amendment.

The SPEAKER. Representative McCall.

Mr. McCALL. Thank you, Mr. Speaker.

Mr. Speaker, I would ask the members to support the Freeman amendment, and I would submit to the members that this is one of the most important tools that we will have at our disposal for us to achieve the energy conservation and demand-side management that we need. And there is no question with this technology that if it is implemented and implemented properly, that we will save both the consumers money and we will save the utilities money. The bottom line is that if we give people the tools and the ability to reduce peak demand, that reduction in peak demand reduces everybody's energy bill, not just one-sided. Everybody gets a reduction in their energy bill when we start managing peak demand in this Commonwealth.

And the other thing that it does, when you reduce that peak demand, you reduce the probability that we are going to have to build more generation in this Commonwealth. The reason why we are here today is because of the growth and demand on the energy front, and if we continue to rely on the energy or consume the energy that we are consuming today, 10 years down the road we are going to have to build at least five new generating facilities at exorbitant costs, at costs of like $25 to $30 billion, and they are costs that our consumers are going to have to pay unless we start giving them the tools to manage, and the Freeman amendment does precisely that. It gives people the ability to, voluntarily, by the way – and I think that is the key to this whole debate, is voluntarily – we are going to allow them to decide whether they want time-of-use pricing.

Just like we do with cell phones today – you get free calls on the weekend or cheaper rates in the evening – you could choose on your electric utility bill with smart meter technology time-of-day pricing, because maybe you are not home during the day, but at nighttime or weekends you want to run the dryer and you know it is going to be a cheaper price, so time-of-use pricing is the way for you to go. Or if you are more savvy, and I know a lot of us in this chamber do not have the time, but you could go for real-time pricing. You will have the ability as the consumer – voluntarily, by the way; understand this is a voluntary program – voluntarily you will have the ability to use real-time pricing that will allow you as a consumer to look at your electric meter on an hour-to-hour, minute-to-minute basis to see where energy consumption is and where peak demand is, and you could make that decision as a consumer, looking at what that kilowatt average is on that meter and decide whether or not you want to run the oven, an iron, or whatever else. If you are savvy enough, you will have that ability under this legislation. Or you could be just like me right now. I will just use same-day pricing. That is what most of us use right now. If you do not want to worry about where the peak demand is, just give me a bill with real-time pricing. You have that ability, under this amendment, to just keep your electric bill the way it is.

But I think we need to give our consumers the ability and the tools to make those kinds of decisions to help reduce peak demand. If we reduce peak demand, we can reduce that certain probability that we are going to have to build more generation. And when you consider peak demand, the demand side of this equation, where we are telling the utility companies that the 100 highest hours of any peak demand in a utility's year, which is generally July or August, the hottest, hottest days of the week where air conditioners are running constantly, that we want you to have the ability to reduce that demand and understand what the consequences of that are.

It is not just all of this money that we are spending on those peak-demand prices, but we can actually help air pollution in this State because utilities have to buy energy on the spot market, which is very expensive. They have to turn on facilities that burn maybe not as efficiently as we would all like. There are increased mercury emissions, increased carbon dioxide emissions by virtue of these 100 highest peak hours that utilities have to turn up extra generation.

Mr. Speaker, I think it is extremely important that we give our consumers this necessary tool, help utilities with the issue of reliability because it will help with reliability when you reduce that peak demand. This is a very, very strong component of the overall energy conservation and demand-side management program, and I would certainly urge each and every one of you to look at this hard and vote affirmatively on the Freeman amendment.

The SPEAKER. Representative Bud George.

Mr. GEORGE. Mr. Speaker, we sit here not only as legislators but also as consumers, and there are none of us that do not understand the concept of supply and demand.

Now, for someone to engage in an argument about why nonpeak hours cost more is simply because the utility had to procure, unassured of what was going to be delivered. And when it is not delivered, the truth of the matter is, it is not cliché, that it is literal and it is factual that you are basically paying more for those hours at nonpeak. So the truth is, you are paying more for power you do not use than for power you do use.

Where there are many, many ways, I am sure, that we can get around to where we are going, the most positive way for the utilities and mostly for the consumer is what we are trying to do with this amendment. So in all fact, if you want to eliminate what is now pressing us very hard, this matter of deregulation and rate cap, the best way to do this is to work with one and all and to give these individuals who pay for power they do not use

an opportunity to look at a meter and make a decision of when they should turn off this or turn off that.

So really and truly, what better way is it for us to understand supply and demand and the concept of needing to pay for something you do not use than it is to look at your bill every month and understand that now there will be an opportunity for the bill to be somewhat less because you are not going to pay for something you did not use.

I would urge that we would support this amendment.

The SPEAKER. The Chair recognizes the minority leader, Representative Smith.

Mr. S. SMITH. Thank you, Mr. Speaker.

Mr. Speaker, when I first started looking into this issue of the smart meters, there was certainly a component of it that makes a lot of sense, and I think one of the previous speakers touched on that, meaning that it would give individual homeowners or businesses the opportunity to adjust their usage based on that actual time-of-day pricing.

What I think is inconsistent with how this amendment has been put forth, though, and what we are saying here on the floor of the House is that members are saying that this is entirely voluntary. That is not completely accurate, Mr. Speaker, because what this amendment would require is for the electric distribution company to put the cost of a smart meter, distribute it to every user in that service territory, into your rate base, and to install those, whatever is involved in the smart meter, on every meter.

What is voluntary is whether you actually use it or not. What I think the difference is in the way we should be approaching this is to allow the individuals who want to take advantage of smart meter technology, allow them to sign up for it to have it installed, then they engage in the program, as opposed to many of the people who might have the availability of the technology, the cost of the technology, but not the desire to use it.

So, Mr. Speaker, while I certainly support the voluntary utilization of smart meters, what I think is going to be a costly measure that many people will not reap the benefits of is the fact that the smart meters will be put onto your bill. The overall cost of distributing, installing, and setting up that smart meter technology will be put onto every consumer of the Commonwealth whether or not they use it.

If we really want to encourage people to use it, I think we ought to allow them to engage it themselves as opposed to forcing them to pay for something they may not use, and that is really the difference, Mr. Speaker, in what I think is right or wrong with this amendment. While I certainly appreciate the direction it is trying to go, I think the fact that it forces the cost of the meters onto every consumer of electricity in Pennsylvania, I think that is the wrong direction to go and would ask for a vote against the amendment.

Thank you, Mr. Speaker.

The SPEAKER. Representative Saylor, on the amendment.

Mr. SAYLOR. Mr. Speaker, I want to make it clear to everybody, this is a mandate. This is not voluntary; it is a mandate required to use smart meters in Pennsylvania. And while I agree, again, with my colleague on the other side of the aisle that this is all great, the Adams Electric, the Rural Cooperatives of Pennsylvania, have been very effective in using smart meter technology to help lower consumers' bills, the choice is up to the consumer to use that technology and whether they want that smart meter installed on their house. The key is, should we in the General Assembly mandate something on consumers that is going to cost them more dollars in their electric bill?

Every year we hear from people who need more money to pay their electric bills throughout this Commonwealth through LIHEAP (Low-Income Home Energy Assistance Program) and their fuel bills, and we constantly are asking the Federal government to put more money into LIHEAP and other programs similar to that, installation programs and so on and so forth, to help consumers.

This issue in particular should be a choice by consumers, not a mandate by the General Assembly onto an additional cost to electric bills in Pennsylvania. So remember, voting for this amendment, while I think it has great goals and where the gentleman wants to get to is very admirable and where we need to get to at some point in time, it still needs to be a consumer choice, not a General Assembly mandate onto consumers that is going to cost them more in their electric bill.

Thank you, Mr. Speaker.

The SPEAKER. Representative Vitali, on the amendment.

Mr. VITALI. Thank you, Mr. Speaker.

I rise in support of the Freeman amendment. This is truly a voluntary measure for consumers, and I think the interesting thing is, going to the gentleman from Jefferson County's point about increased costs with regard to smart metering, it should be noted that PPL installed smart metering in every one of its customers' homes or businesses while they were under a rate cap. In other words, PPL put smart metering in because it benefited them and saved them money, even when they were in a rate-cap situation, so they could not recover the costs. I think that is an important point to make here, because smart meters do save money. They do save the utilities money, because when there is a power outage, they can get the power up faster. They have less problems with customers' bills. It is a money savings.

Another point, Mr. Speaker, is I sat in on the Consumer Affairs Committee meeting on this issue last week, and one thing I was surprised about is many of the major utility companies in Pennsylvania support smart metering. I thought it would be just the opposite. But utility company after utility company testified they supported this.

Mr. Speaker, listen to this; this is from Reliant Energy: "HB 2201 also directs deployment of smart meters, an initiative Reliant fully supports. In fact, Reliant urges the committee to speed up the implementation of advanced metering…." So you have utility companies supporting smart metering.

Listen to this; this is from PECO: "PECO supports the section of H.B. 2201 that provides for a phased-in deployment of smart-meter technology and the availability of time-of-use rates for all customers. Such offerings will provide customers with tools to help enable them to manage their energy consumption…." The same with EPGA (Electric Power Generation Association). Mr. Speaker, this is something, quite surprisingly, that is also supported by utilities.

The next point. Mr. Speaker, I know some of us are hunters. We respect game land. We are fans of our parks and forests. The problem is, if we do not enact things like smart metering, we put them in jeopardy, and here is the connection. There is a national transmission corridor. Huge swaths of Pennsylvania have been designated by the Federal government to be part of this corridor because of the country's need for power lines, and these power lines, if we increase and increase and increase our demand for electricity, will go through Pennsylvania's wooded areas near the view scapes of our national parks. Smart metering

helps us protect our parks and forests and historical places by preventing the need for additional transmission lines.

The next point. Mr. Speaker, consumers need to be aware that rate hikes are coming. In the PECO service area, for example, PECO experts predicted that rates could go as high as 26 percent between 2010 and 2011. Utility rates could increase as high as 26 percent. We need to do something about that. The Freeman amendment does something about that by dealing with reducing demand. It is a very basic economic principle that price is a function of supply and demand, and one thing Freeman does is keep down the lid on the demand for electricity, so when these rate caps come off in 2011, our constituents are not going to be paying these big predicted rate increases because we have helped reduce demand. That is why we are saving consumers money if we can enact measures that will reduce demand.

Mr. Speaker, finally, smart metering helps consumers who do not opt for the time-of-use rates in a number of ways. One, even if you do not opt in, the power goes out, if you have a smart meter in your home, even though you did not opt in to the time-of-use rates, your utility company knows that; it can get your power up much more quickly. So even if you do not use the time-of-use rating, having a smart meter in your home will help you.

Also, Mr. Speaker, another reason why it is necessary to do this in a comprehensive way, as the Freeman bill does, is you can capture the economies of scale if all these meters are installed in a systematic program instead of having an installer go out one by one as people volunteer for this.

Mr. Speaker, for all these reasons I urge the adoption of the Freeman amendment. Thank you.

The SPEAKER. Representative Benninghoff, on the amendment.

Mr. BENNINGHOFF. Thank you, Mr. Speaker.

I wish to see if the maker of the amendment would stand for a couple of questions, please?

The SPEAKER. The gentleman, Representative Freeman, indicates he will stand for interrogation. Representative Benninghoff is in order and may proceed.

Mr. BENNINGHOFF. Thank you.

I was just curious if the maker could tell me how many other States have done this and whether their program was a mandate.

Mr. FREEMAN. I cannot say how many States have done it. I know that the Province of Ontario in Canada has done this.

Mr. BENNINGHOFF. All right. Well, my follow-up question was going to be, obviously, from an economic perspective. I am curious if we know of any savings, but if no other State in the Commonwealth has done that, then I will assume that there are no savings to those States.

My second question concerns, if people in the Commonwealth are mandated to put a meter in their home and prices fluctuate from time to time, is the potential there for a company or a supplier to absorb or inherit a windfall of money or revenue or proceeds? I just cannot imagine that the company is going to be adjusting cost every time that it is adjusted for them back to the consumer. So therefore, I would think that they could inherently see a windfall of profits, as we see oftentimes when the gas pump prices are going up every other day and we know the fuel in the ground has already been paid for a week in advance. Will that not be the same case in this scenario?

Mr. FREEMAN. No, it really will not, and I will tell you why, Mr. Speaker. Keep in mind that the utility company has to purchase energy at various times of the day to meet demand. If that demand is being purchased during peak hour, when you are at the maximum of the system, it is going to be more expensive energy. So we realize two savings with this legislation with my amendment. One is for the consumer – for the customer. They have the opportunity, if they want to opt in to this optional program, to be able to choose their electricity at an off-peak time when it is cheaper than what it is at peak times.

Currently what we get is an averaging of the expensive and the less expensive. So when you pay your electric bill, even if you were to be someone today who runs their electricity at off-peak periods – you are doing it at a time when the actual cost of electricity is cheaper – you are not realizing a savings. You might be doing the utility company a favor, you might be doing the environment a favor, but you are not realizing a savings, because the average cost, or the cost, rather, that you will pay is going to be an averaged-out cost of high peak and low peak.

So even though you are someone who is being conservation-minded, thinking about the environment, thinking about the purchase of electricity, under the current system, you will not realize a savings. Under this amendment, you have the option of entering into that program to realize a savings by buying your electricity at off-peak periods. That reduces the cost for everyone. Again, I go back to the statistic that if just 1 percent of all utility customers were to buy into the optional purchasing proposal, it would be a cost savings for everyone of 10 percent, because it reduces peak-hour demand.

Now, obviously that also helps the utility company, because they do not have to purchase as much energy during a high-peak period, but it is not going to be a windfall situation because they have to justify their rates, obviously. If they do not, it causes the possibility of going to a different utility company. So there is not going to be a windfall of savings in that regard.

Mr. BENNINGHOFF. I appreciate your thorough answer. I think you and I share some obviously common ground where we want to see energy efficiency and energy savings.

Again, under your answer, I am still having difficulty understanding why a company would not try to purchase the bulk of their energy at the lowest cost and know what time period that is, how that subsequently is not going to be sold to me at a higher peak time, and thus I pay a higher rate than what they may have purchased at a lower peak time. And as a customer, how am I going to know that on my bill?

Mr. FREEMAN. Well, once you have the smart meter technology, you will be able to either choose by yourself or by contracting with a third party who can monitor it for you as to when the off-peak periods are. You will know that information, and as such, you will be able to make an informed decision as to when to purchase your electricity.

Maybe you want to run your laundry in the middle of the night when the cost of electricity is down considerably because of it being an off-peak period. Maybe you will set your dishwasher to kick in in the middle of the night, again, when electricity is cheaper. So you will have that information through the smart meter technology, and that will enable you to be able to make smart choices and to reduce your electric bill.

Mr. BENNINGHOFF. And the last question, if you would.

I as a consumer, if this is voluntary, do I have the ability to acquire one of those meters right now? If this is the best thing to come down the road for me and it is going to have the

opportunity for me to save money, can I go and get a meter right now and have it installed in my house?

Mr. FREEMAN. Because of the simple reason that without this amendment, there is no requirement for the utility company to recognize your personal smart meter. You might be able to know when you are purchasing, but keep in mind, under current procedures, utility companies do not give you rates at a cheaper time of day or a more expensive time of day. The only way they bill you is on an average of the overall cost of the electricity.

So unless we can put into place my amendment which will require them to have the optional buy-in program where you can purchase your electricity at a cheaper rate, you will never be able to realize that savings on your own by going out and purchasing a smart meter. You might be able to monitor it, you might be able to see when your rates are higher or lower, but there is nothing that is going to require the utility company to charge you based upon your usage. It requires this amendment to achieve that and to, in essence, require the utility company to give you the savings that they are realizing by you using it at an off-peak period.

Mr. BENNINGHOFF. Thank you. And if I may clarify one last question on that.

Mr. FREEMAN. Sure.

Mr. BENNINGHOFF. So I understand, the part that is actually voluntary is not the installation of the meter statewide by your amendment; it is the billing process by the companies—

Mr. FREEMAN. Well, I would say that—

Mr. BENNINGHOFF. —how I am going to be billed. If this passes, I am going to get a meter whether I want it or not. The only option is going to be on the rates of energy that I would be paying for. So it is the billing that is the optional part?

Mr. FREEMAN. Yeah. I would say that in order for everyone to realize the savings of smart meter technology, it has to be done as a requirement statewide because of economies of scale. But you are right, what we are requiring here is the installation of those meters.

And keep in mind, utility companies change their meters, roughly 5 or 10 percent of their meters, every year. So in a 10-year period of time, whether you want it or not, you as the customer are going to have to pay for the installation currently of a new meter. The difference is, the current meters they install every 10-year cycle is a dumb meter. We are requiring a smart meter. So you will have the opportunity to then buy into that optional plan in which you can purchase your electricity at a cheaper period of time and realize the savings in your electric bill.

Mr. BENNINGHOFF. Thank you.

Mr. Speaker, a quick comment on the amendment itself.

The SPEAKER. The gentleman is in order and may proceed.

Mr. BENNINGHOFF. Thank you, Mr. Speaker.

And again I thank the maker of the amendment for his time in answering those questions. I guess my reservation, obviously, is do we want a statewide mandate? Do we want the government telling you that you have to have a meter put in your property? I think the majority of us appreciate the fact that we want to be more energy conscious, have more efficient appliances, and I think a lot of us are moving that way.

I just struggle with the fact that there is no other State in the Commonwealth that has done this in the past, although I would like to see Pennsylvania obviously be a leader. It gives me some reservations that if this technology is so accurate and so helpful and such a cost reduction savings for the consumer, why is it not being used unilaterally across this great nation? I would ask the members to keep that in mind.

I think it is important that we are smart about our energy use, but I also think we have to think about what government's role is in mandating such a thing.

Mr. Speaker, thank you very much for your time.

The SPEAKER. Representative Bennington, on the amendment.

Ms. BENNINGTON. Thank you, Mr. Speaker.

If Pennsylvania does nothing to reduce its electricity consumption, our State will need to make room for at least 12 new power plants.

Opponents of this amendment talk about the cost to the consumer. All told, not passing Representative Freeman's amendment and HB 2200 will cost $17 billion in capital, fuel, and other costs associated with meeting increases in electricity demand. Smart meters and Representative Freeman's amendment will help reduce this demand.

Again, in response to the queries regarding the cost of this technology, I ask, what is the cost of clean air to our children? What is the cost of clean water to our children? When they ask us, should we tell them that it costs too much? Please vote "yes" on the Freeman amendment.

Thank you, Mr. Speaker.

The SPEAKER. Representative Gabig, on the amendment.

Mr. GABIG. Thank you, Mr. Speaker.

Would the maker of the amendment stand for brief interrogation?

The SPEAKER. The gentleman, Representative Freeman, indicates he will stand for interrogation. Representative Gabig is in order and may proceed.

Mr. GABIG. Thank you, Mr. Speaker.

I have been listening to the debate, and I need to get a few answers that I have not heard yet.

How much would it cost a customer to have a smart meter installed? What would be the cost of that?

Mr. FREEMAN. Excuse me, Mr. Speaker. Are you referring to the actual price of a smart meter? Is that what the question is?

Mr. GABIG. Well, I think there is a cost— As I understand it, there is a cost of the meter and a cost of installation, and so I was trying to find out what that cost would be to an electric customer.

Mr. FREEMAN. Now, this question came up in the Environmental Resources and Energy Committee when we discussed this issue previously. It is difficult to ascertain an actual cost for a variety of reasons. Let me explain, if I may.

If you are looking at the actual cost of a meter, it could be as high as $240, or it could be $175, as was the case with PPL. But what you have to figure in to the actual costs, what will be realized, is the fact that the utility company makes considerable savings with smart meter technology. By installing the smart meters, they will realize savings which will bring the actual cost down dramatically for the actual customer. So in fact, in the case of PPL, they felt that the cost of the meters paid for themselves simply by being able to use this technology to be able to get a hold of outages, blackouts, theft of electricity, to be able to lower the amount of customer complaints, because with this technology, they know how to respond quickly before the complaints overload the system. All of that brings the cost down dramatically.

And one final point, if I may, to answer the gentleman's question, and that is the fact that the cost itself is not going to be

that significant when you think of the overall savings, and we have to think long term. If you are thinking about trying to reduce the amount of electricity that is consumed in this Commonwealth, that is used in this Commonwealth, if you are thinking about saving energy and saving money for the consumer, you need conservation technology like smart meters to bring it down. The actual cost of the meter will be considerably less because of economies of scale, because of the savings that will be realized by the consumer, and because of the simple fact that the utility will only be able to recoup that percentage of the cost that is an actual cost for them. Whatever savings they realize they will not be able to charge the customer for, and the savings to them is considerable.

Mr. GABIG. Wow, what an answer. Now, if I understood the answer, I think the gentleman said between $175 and $240 for a smart meter, for the cost of the meter. Did that include per customer? Does that cost of the meter, the installation, does that include installation or just the cost of the physical meter?

Mr. FREEMAN. Again, with all due respect to the gentleman, Mr. Speaker, it is mixing apples and oranges. That is not the actual cost under this amendment for the simple reason that you have economies of scale which bring that price down, and you have cost savings by the utility which are not borne by the customer. Since the utility actually realizes cost savings under this amendment, it is nowhere near $175 for the meter. When you stop and realize the exact cost savings that occur to the company as well as to the consumer, it is far less.

It is difficult to give the gentleman a precise figure, but I can guarantee the fact that it is considerably less based on the fact that there are cost savings for the utility and obvious savings for those customers who wish to participate in the optional program as well as all utility ratepayers who will realize the benefit from even a small percentage of those customers opting to purchase their electricity at off-peak periods.

Mr. GABIG. All right. I understood that from the gentleman's first response to the question, but if I understood the earlier advocacy of this amendment, it said that the big corporations, the utility companies, are not going to be paying for this installation. It is going to be borne by the customer. So the gentleman keeps bringing up in his responses matters dealing with the utility – it may be savings down the road or not. I am just talking about how much it is going to cost the electric customer to have this installed, and I do not know why it is such a State secret. It is going to cost so much money to go on an electric bill, and I think, to respond to the gentleman's answer, I think we have a duty as the House to tell the people in Pennsylvania how much it is going to cost them. This might be the greatest thing since sliced bread, as the gentleman seems to think. I am not debating that right now. All I want to know is how much we are going to be charging? How much does it cost to do this? And you said it has been done in Ottawa or someplace in Canada—

Mr. FREEMAN. Ontario.

Mr. GABIG. Ontario; I am sorry, and it has also been done by other utilities. We heard that Adams Electric has done it. So how much is it going to cost them to put these meters in? That is the simple question. There should be a dollar figure. If it is not $175 to do it, we should have at least a range that we can tell people. Does the gentleman have that information, after all these hearings he has been to, all this research that he has done, all the investment that he has looked at? I just want to know how much it is initially costing a customer in Pennsylvania to put one of these in their house or in their business. That is a simple question. I hope I can get a simple response from the gentleman.

Mr. FREEMAN. Unfortunately, Mr. Speaker, not all complex issues can be boiled down to a simple answer. That is why they are complex issues.

However, to give the gentleman greater clarity, there is a reasonable and prudent standard within the legislation, within the amendment, rather, and the PUC will determine how much the utility can recoup their costs for on a reasonable and prudent basis. They can only recoup the net costs. Any savings they realize they cannot charge the consumer for.

And I think there is a bit of a misunderstanding on the part of the gentleman, Mr. Speaker, when the gentleman said that this is a cost to the—

Mr. GABIG. Well, Mr. Speaker, if I could rephrase the question since it was—

Mr. FREEMAN. Just let me answer—

Mr. GABIG. —complicated.

The SPEAKER. The gentlemen will suspend.

The Chair will remind the gentleman to ask a question and wait for the responder to give his answer and request that the gentlemen not speak over each other in interrogation.

Mr. FREEMAN. Thank you, Mr. Speaker.

Just to finish my—

Mr. GABIG. Thank you, Mr. Speaker.

If I could just—

The SPEAKER. The Chair will ask the gentlemen to suspend.

The Chair will ask the gentleman, Mr. Gabig, to ask his question and then ask Representative Freeman to respond.

Mr. GABIG. Thank you, Mr. Speaker.

I am going to ask it one more time. Three times can be good, and three times you can be out. Is it fair to say that the gentleman cannot tell the people of Pennsylvania how much it is going to cost them to put these meters in their homes and businesses? Is that fair to say? You just do not know?

Mr. FREEMAN. In answer to your question, it is the PUC which determines the cost based upon a reasonable and prudent decision, and it is wrong for the gentleman to insist that somehow this is a cost that gets directly put at the door of the consumer. It is the utility that has to pay for it. They then have to go to the PUC, as they do for the installation of current meters.

Any expense by a utility in terms of equipment has to go before the PUC to recover the costs. If you expend money as a utility, that gets passed on to the consumer, but under this amendment, there is a savings to the utility company which dramatically brings down the cost of installation, and on top of that, there is a savings to the customer by having the option of purchasing cheaper electricity.

These meters more than pay for themselves. That is the bottom line, and any customer will have to pay for the installation of a dumb meter or a smart meter. If you pay for the installation of a smart meter, you save money. That is the bottom line.

Mr. GABIG. All right. I appreciate the gentleman's candid response to those questions.

Mr. Speaker, I have another question that I do not know if I am going to get any more of a response to or not. But in my district, there are apartment buildings, apartment buildings, where people live in apartment buildings, and there are senior

centers where people live in individual, sort of apartment-style units. And so what I am wondering, is each person that lives in an apartment going to be mandated under this Freeman amendment to get a meter or not? Or if there is an apartment building or a townhouse that has many different units in it that has one meter currently, will each individual apartment dweller in such a situation be required to get one of these meters?

Mr. FREEMAN. With all due respect to the gentleman, Mr. Speaker, we are making the mandate on the utility company to install smart meters. The individual customer does not have to go out and purchase a smart meter. That requirement is being borne by the utility. They have to replace their meters every 10 years anyway. They can either replace it with a dumb meter that does little to save energy and save dollars for the consumer, or we can, through this amendment, require them to purchase and install smart meters that save money for the consumer and the utility company by cutting down on the amount of energy that is consumed.

Mr. GABIG. So if I understand the gentleman's response, it will be in the power of the utility company to decide whether or not they are going to require each person in an apartment building or not to have a meter or not. It will be in their power to decide whether to do that and whether to pass that cost on to their customers. Is that correct?

Mr. FREEMAN. No, Mr. Speaker. It is not the power—

Mr. GABIG. There is no protection in this legislation—

Mr. FREEMAN. Mr. Speaker, can I please answer the question?

The SPEAKER. The Chair will again remind the gentlemen not to speak over each other.

Mr. FREEMAN. I would like to be able to—

Mr. GABIG. I thought he was done when he said no, Mr. Speaker.

The SPEAKER. The gentleman will suspend. The gentleman is not in order. Representative Freeman will respond.

Mr. FREEMAN. Thank you, Mr. Speaker.

It is not the power of the utility company; it is a requirement in our conservation efforts here in this Commonwealth with this amendment that they install smart meters.

A utility company has the requirement to have meters for all of its customers. They have to replace those meters every 10 years because they wear out. Now, they can either put in a dumb meter that does not allow the customer to choose what time of day they wish to purchase their electricity, either at a cheaper off-peak period or at a more expensive high-demand period, or through this amendment, we can require those utility companies to utilize smart meter technology to save money in terms of the purchase of electricity for them and, most importantly, for the customer. If we wish to save money for the customer, you need smart meter technology, and it has to be done on a statewide basis if you are to realize economies of scale. It is a basic point of economics.

Mr. GABIG. Thank you, Mr. Speaker.

That concludes my attempts to question the maker of the amendment. If I might speak on the amendment.

The SPEAKER. The gentleman is in order and may proceed.

Mr. GABIG. The problem I am having with the amendment is I think if I were called on the telephone and asked, are you for a smart legislator or a dumb legislator, are you for a smart card or a dumb card, are you for a smart meter or a dumb meter, I would probably answer, I am for the smart legislator, the smart card, the smart meter. But if they start saying, well, for the smart legislator you are going to pay five times more money and for the dumb legislator you are going to pay five times less money, for the smart card you are going to pay five times more money and for the dumb card you are going to pay five times less money, for the smart meter you are going to pay we do not know how much more money because we will not tell you, but it is not going to be the utilities that pay for it because we took care of them in our amendment; they are taken care of in this Freeman amendment. The big utility companies and corporations, they are all right with it; they support this, but the customer, well, you are going to pay the freight for this mandate, this State mandate.

You know, I think some of you know I was in the Navy before I came here to the House, and we were under orders. I was overseas, I can remember, and the command said, hey, we are running out of water. I was stationed in Guantanamo Bay, Cuba – there has been a lot in the news about it – and they did not have fresh water down there. They had to desalinate the water, and the Army would come with their big desalination things and they would have to take the salt out of the water so that we could use it. And we would start running out of water, and they would come down and say, you cannot wash your clothes between such and such a time and such and such a time; you can only do it, you know, midnight to 2 o'clock in the morning. You can only wash your clothes on Tuesdays and Thursdays; you cannot do it Wednesdays. And there were other regulation and command and control items that we had to abide by. And I was in the Navy; I said "yes, sir" and saluted. Some people got in trouble for washing their clothes on the wrong day. That is what this is. This is a mandate to people saying you have to buy this whether this is good for you or not good for you; we are telling them what to do.

And it is going to cost them money. The average apartment person, their electric bill is, I do not know, when I used to live in an apartment it was $30, maybe, a month or something like that. It was not that much money. The gentleman would not answer the question. I do not know what the answer is. I heard different figures. I heard it could be up to $300 to install one of these smart meters, for the cost of the meter and to install it. So somebody is paying $30 a month, or a senior citizen that is on a fixed income, to have that passed on by the big utility company to pay for this because somehow it is going to, in the long run, be a cost benefit to us. Now, maybe it is, and maybe these things are great, but it should not be forced upon people to have to do it who live on fixed incomes. It should be something that is voluntary and that the market drives.

I think that the gentleman from York, Stan Saylor, mentioned that Adams Electric Co-op has a similar program, but it is not forced on people; it is a voluntary program, and they can use the market to decide whether they want to do it or not.

We also have heard that you have to have Internet capability to do this, and in rural areas – I know in the big cities and other areas I am told that there is Internet capability. I do not know if that is true in all cities across Pennsylvania. But in some of the areas that I represent, they do not have that out there yet, so they are going to be forced to buy this $300, this cost will be passed on to them, and they will not get the benefit of it. They will not get the benefit of it.

So I appreciate the intent of this amendment. I think there are some serious questions, unresolved questions, that have not been satisfactorily dealt with, and that is why the gentleman, who is a very good friend of mine, by the way, was unable to

give me direct answers to and to answer the people in Pennsylvania the questions that need to be answered before we go to such a strong mandate, a very expensive mandate.

So for that reason, I am not going to be able to support this amendment, Mr. Speaker.

The SPEAKER. The Chair will ask all members to take their seats and reduce the noise level on the floor. Is there any other member seeking recognition on the amendment, because the Chair is about to recognize the prime sponsor for the second time.

Representative Levdansky, on the amendment.

Mr. LEVDANSKY. Thank you, Mr. Speaker.

Mr. Speaker, I just want to make a clarification in case people understand the way markets are supposed to work. You know, if you read Adam Smith and the classical economic doctrines, prices are accurate and fair when buyers and sellers in a perfectly competitive marketplace have access to goods and services and to information. Capitalism assumes perfect competition and perfect access of buyers and sellers to information. That is when markets work.

Essentially what the Freeman amendment does is requires the electric utility industries to roll out a plan to provide all consumers with smart meters, smart meters so that consumers will know how much electric costs at a given time of the day so that they can adjust their purchasing habits according to their preferences for what they want to pay for electricity.

If Adam Smith were here, if Adam Smith, the father of capitalism, were here, he would say you have got to vote for this. If you want markets to work, if you want markets to work, then consumers have to have access to perfect information. This amendment gives consumers access to perfect information so capitalism and the market distribution of electricity will work. If you are a conservative economist and a conservative legislator, you have got to vote for this.

Support it. Thank you.

The SPEAKER. Is there any member seeking recognition before the Chair recognizes the prime sponsor of the amendment?

The Chair recognizes Representative Freeman for the second time.

Mr. FREEMAN. Thank you, Mr. Speaker.

Mr. Speaker, there are a number of points to be kept in mind in regard to this amendment and what it will achieve. First, to clear up some misunderstandings that were expressed on the floor.

Participating in the optional program, deciding whether you want to choose whether to purchase your electricity at peak times or off-peak times, that is an optional voluntary program. We are not mandating that people have to buy into that process, but they will be advised to do so, because it would empower them to be informed and to purchase their electricity at a cheaper time. No one is saying they have to run their laundry in the middle of the night, no one is saying they have to use their dishwasher in the middle of the night, but if they so choose, in order to realize great savings on their utility bill, under this amendment, they would have that opportunity.

One of the things that has to be kept in mind, utility companies replace their meters every 10 years. Somewhere between 5 and 10 percent of all current dumb meters have to be replaced every 10 years. So why not replace those dumb meters with smart meters that can give consumers options and allow them to control their own destiny as far as electric utility rates by purchasing electricity at a cheaper off-peak period, if they choose to do so?

In this amendment we provide for a reasonable and prudent standard in terms of the utility's ability to recoup its cost, so it is the cost of the meter minus the savings to the utility. And if you ask people from PPL, they say the meters pay for themselves. The cost savings to the utility company are tremendous, and therefore, the cost to be borne by the customer is limited and in fact will result in tremendous savings to customers because of the ability to purchase power at a cheaper off-peak period.

I have to drive home one very critical point once again. If only 1 percent of all utility customers, of all consumers, decide to opt in to the program to be able to purchase their electricity at a cheaper off-peak period, that means a savings, a minimum of 10 percent, to all utility customers, because it reduces the purchasing of electricity at the most expensive, high-peak periods of time. That is a savings for everyone. This legislation is a win-win situation for utility companies but more importantly for consumers, allowing utility customers to reduce the cost of their electricity bill. That is the bottom line.

One speaker said that this made no common sense. It makes a great deal of common sense. It is the essence of common sense to utilize technology in a period of energy crisis in order to reduce costs for the consumer and to conserve energy. For too long we have buried our head in the sand when it comes to making good measures to conserve energy here in this Commonwealth and throughout our nation. Today, with this amendment, we have the opportunity to make a tremendous stride forward in conserving energy and reducing the cost of electricity for our consumers, and therefore, I urge a "yes" vote.

On the question recurring,
Will the House agree to the amendment?

The following roll call was recorded:

YEAS–128

Adolph	George	McGeehan	Scavello
Argall	Gerber	McI. Smith	Schroder
Belfanti	Gergely	Melio	Seip
Bennington	Gibbons	Mensch	Shapiro
Beyer	Goodman	Micozzie	Siptroth
Biancucci	Grucela	Milne	Smith, K.
Bishop	Haluska	Moyer	Smith, M.
Blackwell	Hanna	Mundy	Solobay
Brennan	Harhai	Murt	Staback
Buxton	Harkins	Myers	Sturla
Caltagirone	Harper	O'Brien, M.	Surra
Carroll	Hornaman	O'Neill	Tangretti
Casorio	James	Oliver	Taylor, J.
Civera	Josephs	Pallone	Taylor, R.
Cohen	Keller, W.	Parker	Thomas
Conklin	Kenney	Pashinski	Vereb
Costa	Kessler	Payton	Vitali
Cruz	Killion	Petrarca	Wagner
Curry	King	Petri	Walko
Daley	Kirkland	Petrone	Wansacz
Dally	Kortz	Preston	Waters
DeLuca	Kotik	Quinn	Watson
DePasquale	Kula	Ramaley	Wheatley
Dermody	Leach	Raymond	White
DeWeese	Lentz	Readshaw	Williams
DiGirolamo	Levdansky	Roebuck	Wojnaroski
Donatucci	Longietti	Ross	Yewcic
Eachus	Mahoney	Rubley	Youngblood
Evans, D.	Manderino	Sabatina	Yudichak
Fabrizio	Mann	Sainato	

Frankel	Mantz	Samuelson	O'Brien, D.,
Freeman	Markosek	Santoni	Speaker
Galloway	McCall		

NAYS–73

Baker	Fleck	Maher	Quigley
Barrar	Gabig	Major	Rapp
Bastian	Geist	Marshall	Reed
Bear	Gillespie	Marsico	Reichley
Benninghoff	Gingrich	McIlhattan	Roae
Boback	Godshall	Metcalfe	Rock
Boyd	Grell	Millard	Rohrer
Brooks	Harhart	Miller	Saylor
Cappelli	Harris	Moul	Smith, S.
Causer	Helm	Mustio	Sonney
Clymer	Hennessey	Nailor	Stairs
Cox	Hershey	Nickol	Steil
Creighton	Hess	Payne	Stern
Cutler	Hickernell	Peifer	Stevenson
Denlinger	Hutchinson	Perry	Swanger
Ellis	Kauffman	Phillips	True
Evans, J.	Keller, M.	Pickett	Turzai
Everett	Mackereth	Pyle	Vulakovich
Fairchild			

NOT VOTING–0

EXCUSED–2

Perzel	Shimkus

The majority having voted in the affirmative, the question was determined in the affirmative and the amendment was agreed to.

On the question recurring,
Will the House agree to the bill on second consideration as amended?

The SPEAKER. The House will be at ease.

The Chair announces his intention to recess regular session, go over HB 2200 temporarily, and go into special session at 3:26 p.m.

BILL PASSED OVER TEMPORARILY

The SPEAKER. HB 2200 will be over temporarily.

RECESS

The SPEAKER. Regular session will now be in recess.

AFTER RECESS

The time of recess having expired, the House was called to order.

SUPPLEMENTAL CALENDAR B CONTINUED

CONSIDERATION OF HB 2200 CONTINUED

The SPEAKER. The Chair returns to HB 2200.

On the question recurring,
Will the House agree to the bill on second consideration as amended?

Mr. **KORTZ** offered the following amendment No. **A05750:**

Amend Title, page 1, line 2, by inserting after "Statutes,"
providing for recovery of certain labor relations expenses;

Amend Bill, page 1, lines 7 and 8, by striking out all of said lines and inserting

Section 1. Title 66 of the Pennsylvania Consolidated Statutes is amended by adding a section to read:
§ 1329. Recovery of certain labor relations expenses.

No public utility may charge its customers as a permissible operating expense for ratemaking purposes any portion of the direct or indirect cost of meetings, publications, consultants, attorneys or other professional services and expenses associated with the utility's efforts to dissuade the employees of the utility, or the employees of any affiliated interest of the utility as defined in section 2101 (relating to definition of affiliated interest), from becoming or remaining a member in, or otherwise being represented by, any labor union.

Section 2. Section 2803 of Title 66 is amended by adding definitions to read:

Amend Sec. 2, page 3, line 10, by striking out "2" and inserting
3

Amend Sec. 3, page 13, line 23, by striking out "3" and inserting
4

On the question,
Will the House agree to the amendment?

The SPEAKER. The Chair recognizes Representative Kortz on the amendment.

Mr. KORTZ. Thank you, Mr. Speaker.

Mr. Speaker, amendment A5750 deals with the labor relations expenses of public utilities. Mr. Speaker, there is a right under the laws of this country and the Commonwealth of Pennsylvania for employees to form a union and bargain collectively to secure various protections and benefits on the job. Basically, Mr. Speaker, this amendment says that utilities may not charge its customers the cost of dissuading employees from joining a union or remaining a member of the union.

Mr. Speaker, I would urge all of my colleagues to support this amendment.

The SPEAKER. The Chair recognizes Representative Ross on the amendment.

Mr. ROSS. Thank you, Mr. Speaker.

My understanding of the current functioning of the Public Utility Commission and what they would or would not allow into the rate base would prevent the elements that my colleague from Allegheny County wishes to not be included in a rate case anyway. So I do not think that this amendment really advances things further, neither does it do any harm.

The SPEAKER. Will the House agree to the amendment? The Chair recognizes the majority whip.

Mr. McCALL. Thank you, Mr. Speaker.

Mr. Speaker, I would agree that there are provisions in the law, but this will make sure that those provisions are enforced, and I would ask that we support the Kortz amendment.

On the question recurring,

Will the House agree to the amendment?

The following roll call was recorded:

YEAS–137

Adolph	Galloway	Markosek	Santoni
Argall	George	Marshall	Scavello
Baker	Gerber	McCall	Seip
Barrar	Gergely	McGeehan	Shapiro
Belfanti	Gibbons	McI. Smith	Siptroth
Bennington	Godshall	Melio	Smith, K.
Beyer	Goodman	Mensch	Smith, M.
Biancucci	Grell	Micozzie	Solobay
Bishop	Grucela	Moyer	Sonney
Blackwell	Haluska	Mundy	Staback
Brennan	Hanna	Murt	Stairs
Buxton	Harhai	Mustio	Sturla
Caltagirone	Harhart	Myers	Surra
Carroll	Harkins	O'Brien, M.	Tangretti
Casorio	Harper	O'Neill	Taylor, J.
Civera	Hornaman	Oliver	Taylor, R.
Cohen	James	Pallone	Thomas
Conklin	Josephs	Parker	Vereb
Costa	Keller, M.	Pashinski	Vitali
Cruz	Keller, W.	Payne	Vulakovich
Curry	Kenney	Payton	Wagner
Daley	Kessler	Petrarca	Walko
Dally	Killion	Petrone	Wansacz
DeLuca	King	Preston	Waters
DePasquale	Kirkland	Pyle	Wheatley
Dermody	Kortz	Ramaley	White
DeWeese	Kotik	Raymond	Williams
DiGirolamo	Kula	Readshaw	Wojnaroski
Donatucci	Leach	Reed	Yewcic
Eachus	Lentz	Reichley	Youngblood
Evans, D.	Levdansky	Roebuck	Yudichak
Evans, J.	Longietti	Ross	
Fabrizio	Mahoney	Sabatina	O'Brien, D.,
Frankel	Manderino	Sainato	Speaker
Freeman	Mann	Samuelson	

NAYS–64

Bastian	Fleck	Mantz	Quinn
Bear	Gabig	Marsico	Rapp
Benninghoff	Geist	McIlhattan	Roae
Boback	Gillespie	Metcalfe	Rock
Boyd	Gingrich	Millard	Rohrer
Brooks	Harris	Miller	Rubley
Cappelli	Helm	Milne	Saylor
Causer	Hennessey	Moul	Schroder
Clymer	Hershey	Nailor	Smith, S.
Cox	Hess	Nickol	Steil
Creighton	Hickernell	Peifer	Stern
Cutler	Hutchinson	Perry	Stevenson
Denlinger	Kauffman	Petri	Swanger
Ellis	Mackereth	Phillips	True
Everett	Maher	Pickett	Turzai
Fairchild	Major	Quigley	Watson

NOT VOTING–0

EXCUSED–2

Perzel	Shimkus

The majority having voted in the affirmative, the question was determined in the affirmative and the amendment was agreed to.

On the question recurring,

Will the House agree to the bill on second consideration as amended?

Mr. **ROSS** offered the following amendment No. **A05747:**

Amend Sec. 2 (Sec. 2806.1), page 7, line 21, by inserting after "established."

The program administrator, or its appointed fiscal agent, shall administer any and all funds to be used as payments to the third-party entities, and shall disburse said funds upon finding by the program administrator that the selected third-party entity complied with the terms of the agreement between the program administrator and the selected third-party entity.

Amend Sec. 2 (Sec. 2806.1), page 8, lines 20 and 21, by striking out all of line 20 and inserting

(2) Upon approval by the commission of a recommendation by the program administrator for selection of a third-party entity to

Amend Sec. 2 (Sec. 2806.1), page 8, lines 29 and 30; pages 9 and 10, lines 1 through 30; page 11, lines 1 through 3, by striking out all of said lines on said pages and inserting

(e) Plan goals.–

(1) The program administrator shall ensure that each proposal submitted by a third-party entity to deliver a program of energy efficiency measures includes meeting the goal of reaching an incremental annual energy savings based on a percentage of all electricity sold in calendar year 2007 of 0.4% in 2010 and 2.5% in 2014 and each year thereafter. The program administrator shall ensure that a third-party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company. After December 31, 2014, the commission, in consultation with the program administrator, may adopt additional incremental energy efficiency goals. These additional incremental goals may be based upon, but not limited to: the costs and benefits associated with energy efficiency measures, updated or new technologies and economic conditions that may exist at the time the additional incremental goals are being considered. The commission shall undertake a public hearing process to receive input regarding new proposed new incremental goals prior to their implementation.

(2) The program administrator shall ensure that each proposal submitted by a third-party entity to deliver a program of demand-side response measures includes meeting the goal of reducing peak demand from a target year being the calendar year 2007 on a weather-normalized basis and adjusted to eliminate the effect of emergency load control procedures implemented by a regional transmission organization by an amount equal to 2.0% in the 100 hours of highest demand in 2010, 4.0% in the 100 hours of highest demand in 2012 and each year thereafter. The program administrator shall ensure a third-party entity meets the goals contained in this section through the implementation of a program of demand-side resources measures throughout the service territory of the electric distribution company. After December 31, 2012, the commission, in consultation with the program administrator, may adopt additional incremental peak load reduction goals. These additional incremental goals may be based upon, but not limited to: the costs and benefits associated with demand-side response measures, updated load growth forecasts and economic conditions that may exist at the time the additional incremental goals are being considered.

The commission shall undertake a public hearing process to receive input regarding new proposed new incremental goals prior to their implementation.

On the question,
Will the House agree to the amendment?

The SPEAKER. The Chair recognizes Representative Ross on the amendment.

Mr. ROSS. Thank you, Mr. Speaker.

Amendment A05747 cleans up several elements in the bill which I think were, when it was redrafted, made a little less clear. In particular, it attempts to make it quite clear exactly how the payments would flow through the program administrator to the third-party organizations, not necessarily going through the electric distribution companies. It also makes it clear that the commission, once the commission has approved a recommendation for the third-party administrator, that this process move forward.

And finally, we go through the planned goals one more time. Obviously, the first section is less important now because the interim goal on energy efficiency had been established by the Freeman amendment, but I would point out that there is no interim goal in the demand-side management portion, and I think that that is an important element for us to get some interim cost savings as price caps come off.

That is all that is contained in this particular amendment, and I urge the members to have a positive vote.

The SPEAKER. Representative McCall.

Mr. McCALL. Thank you, Mr. Speaker.

Mr. Speaker, I would ask that the members oppose the Ross amendment.

Two fronts. On the first section of his amendment, he removes the language concerning the program administrator or its appointed fiscal agent. The problem with that is there is a question on funding, a fiscal concern by the removal of that language in this amendment. The question, you know, arises, where does the money come from to pay the third-party entities? You know, does it come out of the General Fund budget or General Fund appropriations, or does it come out of the PUC budget? And the amendment really does not speak to that.

But secondly and even more importantly is, he leaves the cap in place on the energy conservation provisos in the law or in this bill. We cap or put a hard cap on the amount of money the utilities can spend each year to achieve their energy conservation goals, 2 percent of their gross revenues. The problem I see is that the gentleman leaves the cap in place but he raises the goal line or the bar as far as how much or what percentage of reductions are necessary, and because of the fact that the cap is maintained yet the goal has been raised, we do not feel that there is enough money there to take care of the goals that he implements in the legislation or in the amendment, and therefore, I would ask for a negative vote on the amendment.

The SPEAKER. Is there any member seeking recognition before the Chair recognizes the prime sponsor of the amendment for the second time?

Representative Vitali.

Mr. VITALI. Thank you, Mr. Speaker.

I just want to rise to acknowledge all of the excellent work the Representative from Chester County has done, not only on this particular amendment but on the bill as a whole. His ideas and his hard work have really brought us in large measure to what we are. So if I would vote against this measure, which I very well may, it is not a reflection of the ideas contained in this amendment but it is more a matter of the overall strategy of getting a bill to the other side and getting it signed into law.

So I just wanted to tip my hat to Representative Ross for all the good work he has done.

The SPEAKER. The Chair thanks the gentleman – and his hat.

Representative Ross, for the second time.

Mr. ROSS. Mr. Speaker, with some reluctance, I ask the members to read my amendment. My amendment does not change any of the goal targets. That is a misreading of my amendment. It uses the underlying goal targets in the bill.

Secondly, the other provision which was referred to earlier in debate is also in error. I believe that the gentleman in question was reading the wrong amendment. Please refer all members to 5747, not 5730, and once again I urge a positive vote on this amendment.

On the question recurring,
Will the House agree to the amendment?

The following roll call was recorded:

YEAS–103

Adolph	Fleck	Marsico	Reed
Argall	Freeman	McIlhattan	Reichley
Baker	Gabig	Mensch	Roae
Barrar	Geist	Metcalfe	Rock
Bastian	Gillespie	Micozzie	Rohrer
Bear	Gingrich	Millard	Ross
Benninghoff	Godshall	Miller	Rubley
Bennington	Grell	Milne	Samuelson
Beyer	Harhart	Moul	Saylor
Boback	Harper	Moyer	Scavello
Boyd	Harris	Murt	Schroder
Brooks	Helm	Mustio	Smith, S.
Cappelli	Hennessey	Nailor	Sonney
Causer	Hershey	Nickol	Stairs
Civera	Hess	O'Neill	Steil
Clymer	Hickernell	Payne	Stern
Cox	Hutchinson	Peifer	Stevenson
Creighton	Kauffman	Perry	Swanger
Cutler	Keller, M.	Petri	Taylor, J.
Dally	Kenney	Phillips	True
Denlinger	Killion	Pickett	Turzai
DiGirolamo	Mackereth	Pyle	Vereb
Ellis	Maher	Quigley	Vitali
Evans, J.	Major	Quinn	Vulakovich
Everett	Mantz	Rapp	Watson
Fairchild	Marshall	Raymond	

NAYS–98

Belfanti	George	Manderino	Shapiro
Biancucci	Gerber	Mann	Siptroth
Bishop	Gergely	Markosek	Smith, K.
Blackwell	Gibbons	McCall	Smith, M.
Brennan	Goodman	McGeehan	Solobay
Buxton	Grucela	McI. Smith	Staback
Caltagirone	Haluska	Melio	Sturla
Carroll	Hanna	Mundy	Surra
Casorio	Harhai	Myers	Tangretti
Cohen	Harkins	O'Brien, M.	Taylor, R.
Conklin	Hornaman	Oliver	Thomas
Costa	James	Pallone	Wagner
Cruz	Josephs	Parker	Walko

Curry	Keller, W.	Pashinski	Wansacz
Daley	Kessler	Payton	Waters
DeLuca	King	Petrarca	Wheatley
DePasquale	Kirkland	Petrone	White
Dermody	Kortz	Preston	Williams
DeWeese	Kotik	Ramaley	Wojnaroski
Donatucci	Kula	Readshaw	Yewcic
Eachus	Leach	Roebuck	Youngblood
Evans, D.	Lentz	Sabatina	Yudichak
Fabrizio	Levdansky	Sainato	
Frankel	Longietti	Santoni	O'Brien, D.,
Galloway	Mahoney	Seip	Speaker

NOT VOTING–0

EXCUSED–2

Perzel	Shimkus

The majority having voted in the affirmative, the question was determined in the affirmative and the amendment was agreed to.

On the question recurring,

Will the House agree to the bill on second consideration as amended?

The SPEAKER. The Chair recognizes Representative Ross.

Mr. ROSS. Thank you, Mr. Speaker.

I would like to withdraw the other amendments that I had previously offered.

The SPEAKER. The Chair thanks the gentleman.

The Chair is not aware of any other amendments pending to the bill.

On the question recurring,

Will the House agree to the bill on second consideration as amended?

AMENDMENT A05747 RECONSIDERED

The SPEAKER. It has been moved by Representative McCall and Representative Surra that the vote by which amendment A05747 was passed to HB 2200, PN 3176, on the 11th day of February 2008 be reconsidered.

On the question,

Will the House agree to the motion?

The following roll call was recorded:

YEAS–102

Belfanti	Galloway	Manderino	Shapiro
Bennington	George	Mann	Siptroth
Biancucci	Gerber	Markosek	Smith, K.
Bishop	Gergely	McCall	Smith, M.
Blackwell	Gibbons	McGeehan	Solobay
Brennan	Goodman	McI. Smith	Staback
Buxton	Grucela	Melio	Sturla
Caltagirone	Haluska	Mundy	Surra
Carroll	Hanna	Myers	Tangretti
Casorio	Harhai	O'Brien, M.	Taylor, R.
Cohen	Harkins	Oliver	Thomas
Conklin	Hornaman	Pallone	Vitali
Costa	James	Parker	Wagner
Cruz	Josephs	Pashinski	Walko
Curry	Keller, W.	Payton	Wansacz
Daley	Kessler	Petrarca	Waters
DeLuca	King	Petrone	Wheatley
DePasquale	Kirkland	Preston	White
Dermody	Kortz	Ramaley	Williams
DeWeese	Kotik	Readshaw	Wojnaroski
Donatucci	Kula	Roebuck	Yewcic
Eachus	Leach	Sabatina	Youngblood
Evans, D.	Lentz	Sainato	Yudichak
Fabrizio	Levdansky	Samuelson	
Frankel	Longietti	Santoni	O'Brien, D.,
Freeman	Mahoney	Seip	Speaker

NAYS–99

Adolph	Fleck	Marsico	Raymond
Argall	Gabig	McIlhattan	Reed
Baker	Geist	Mensch	Reichley
Barrar	Gillespie	Metcalfe	Roae
Bastian	Gingrich	Micozzie	Rock
Bear	Godshall	Millard	Rohrer
Benninghoff	Grell	Miller	Ross
Beyer	Harhart	Milne	Rubley
Boback	Harper	Moul	Saylor
Boyd	Harris	Moyer	Scavello
Brooks	Helm	Murt	Schroder
Cappelli	Hennessey	Mustio	Smith, S.
Causer	Hershey	Nailor	Sonney
Civera	Hess	Nickol	Stairs
Clymer	Hickernell	O'Neill	Steil
Cox	Hutchinson	Payne	Stern
Creighton	Kauffman	Peifer	Stevenson
Cutler	Keller, M.	Perry	Swanger
Dally	Kenney	Petri	Taylor, J.
Denlinger	Killion	Phillips	True
DiGirolamo	Mackereth	Pickett	Turzai
Ellis	Maher	Pyle	Vereb
Evans, J.	Major	Quigley	Vulakovich
Everett	Mantz	Quinn	Watson
Fairchild	Marshall	Rapp	

NOT VOTING–0

EXCUSED–2

Perzel	Shimkus

The majority having voted in the affirmative, the question was determined in the affirmative and the motion was agreed to.

On the question recurring,

Will the House agree to the amendment?

The clerk read the following amendment No. **A05747:**

Amend Sec. 2 (Sec. 2806.1), page 7, line 21, by inserting after "established."

The program administrator, or its appointed fiscal agent, shall administer any and all funds to be used as payments to the third-party entities, and shall disburse said funds upon finding by the program administrator that the selected third-party entity complied with the terms of the agreement between the program administrator and the selected third-party entity.

Amend Sec. 2 (Sec. 2806.1), page 8, lines 20 and 21, by striking out all of line 20 and inserting

(2) Upon approval by the commission of a recommendation by the program administrator for selection of a third-party entity to

Amend Sec. 2 (Sec. 2806.1), page 8, lines 29 and 30; pages 9 and 10, lines 1 through 30; page 11, lines 1 through 3, by striking out all of said lines on said pages and inserting

(e) Plan goals.–

(1) The program administrator shall ensure that each proposal submitted by a third-party entity to deliver a program of energy efficiency measures includes meeting the goal of reaching an incremental annual energy savings based on a percentage of all electricity sold in calendar year 2007 of 0.4% in 2010 and 2.5% in 2014 and each year thereafter. The program administrator shall ensure that a third-party entity meets the goals contained in this section through the implementation of a program of energy efficiency measures throughout the service territory of the electric distribution company. After December 31, 2014, the commission, in consultation with the program administrator, may adopt additional incremental energy efficiency goals. These additional incremental goals may be based upon, but not limited to: the costs and benefits associated with energy efficiency measures, updated or new technologies and economic conditions that may exist at the time the additional incremental goals are being considered. The commission shall undertake a public hearing process to receive input regarding new proposed new incremental goals prior to their implementation.

(2) The program administrator shall ensure that each proposal submitted by a third-party entity to deliver a program of demand-side response measures includes meeting the goal of reducing peak demand from a target year being the calendar year 2007 on a weather-normalized basis and adjusted to eliminate the effect of emergency load control procedures implemented by a regional transmission organization by an amount equal to 2.0% in the 100 hours of highest demand in 2010, 4.0% in the 100 hours of highest demand in 2012 and each year thereafter. The program administrator shall ensure a third-party entity meets the goals contained in this section through the implementation of a program of demand-side resources measures throughout the service territory of the electric distribution company. After December 31, 2012, the commission, in consultation with the program administrator, may adopt additional incremental peak load reduction goals. These additional incremental goals may be based upon, but not limited to: the costs and benefits associated with demand-side response measures, updated load growth forecasts and economic conditions that may exist at the time the additional incremental goals are being considered. The commission shall undertake a public hearing process to receive input regarding new proposed new incremental goals prior to their implementation.

On the question recurring,
Will the House agree to the amendment?

The following roll call was recorded:

YEAS–98

Adolph	Fleck	Marsico	Raymond
Argall	Gabig	McIlhattan	Reed
Baker	Geist	Mensch	Reichley
Barrar	Gillespie	Metcalfe	Roae
Bastian	Gingrich	Micozzie	Rock
Bear	Godshall	Millard	Rohrer
Benninghoff	Grell	Miller	Ross
Beyer	Harhart	Milne	Rubley
Boback	Harper	Moul	Saylor
Boyd	Harris	Moyer	Scavello
Brooks	Helm	Murt	Schroder
Cappelli	Hennessey	Mustio	Smith, S.
Causer	Hershey	Nailor	Sonney
Civera	Hess	Nickol	Stairs
Clymer	Hickernell	O'Neill	Steil
Cox	Hutchinson	Peifer	Stern
Creighton	Kauffman	Perry	Stevenson
Cutler	Keller, M.	Petri	Swanger
Dally	Kenney	Phillips	Taylor, J.
Denlinger	Killion	Pickett	True
DiGirolamo	Mackereth	Pyle	Turzai
Ellis	Maher	Quigley	Vereb
Evans, J.	Major	Quinn	Vulakovich
Everett	Mantz	Rapp	Watson
Fairchild	Marshall		

NAYS–103

Belfanti	George	Mann	Shapiro
Bennington	Gerber	Markosek	Siptroth
Biancucci	Gergely	McCall	Smith, K.
Bishop	Gibbons	McGeehan	Smith, M.
Blackwell	Goodman	McI. Smith	Solobay
Brennan	Grucela	Melio	Staback
Buxton	Haluska	Mundy	Sturla
Caltagirone	Hanna	Myers	Surra
Carroll	Harhai	O'Brien, M.	Tangretti
Casorio	Harkins	Oliver	Taylor, R.
Cohen	Hornaman	Pallone	Thomas
Conklin	James	Parker	Vitali
Costa	Josephs	Pashinski	Wagner
Cruz	Keller, W.	Payne	Walko
Curry	Kessler	Payton	Wansacz
Daley	King	Petrarca	Waters
DeLuca	Kirkland	Petrone	Wheatley
DePasquale	Kortz	Preston	White
Dermody	Kotik	Ramaley	Williams
DeWeese	Kula	Readshaw	Wojnaroski
Donatucci	Leach	Roebuck	Yewcic
Eachus	Lentz	Sabatina	Youngblood
Evans, D.	Levdansky	Sainato	Yudichak
Fabrizio	Longietti	Samuelson	
Frankel	Mahoney	Santoni	O'Brien, D.,
Freeman	Manderino	Seip	Speaker
Galloway			

NOT VOTING–0

EXCUSED–2

Perzel	Shimkus

Less than the majority having voted in the affirmative, the question was determined in the negative and the amendment was not agreed to.

On the question recurring,

Will the House agree to the bill on second consideration as amended?

The SPEAKER. Does Representative Ross still wish to withdraw the other amendments?

Mr. ROSS. I have no interest in wasting the time of the body.

The SPEAKER. The Chair thanks the gentleman.

On the question recurring,

Will the House agree to the bill on second consideration as amended?

Bill as amended was agreed to.

(Bill as amended will be reprinted.)

Appendix N

CALENDAR CONTINUED

BILLS ON THIRD CONSIDERATION

The House proceeded to third consideration of **HB 2200, PN 3218,** entitled:

An Act amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, providing for recovery of certain labor relations expenses; further providing for definitions; providing for adoption of energy efficiency and demand-side response; and further providing for duties of electric distribution companies.

On the question,
Will the House agree to the bill on third consideration?

Mr. **GEORGE** offered the following amendment No. **A05845:**

Amend Sec. 3 (Sec. 2806.1), page 9, line 19, by striking out "(c)(6)(iv)" and inserting
(c)(6)(iii)

On the question,
Will the House agree to the amendment?

The SPEAKER. The Chair recognizes Representative George on the amendment.

Mr. GEORGE. Mr. Speaker, this is a technical amendment that just makes a technical change. It does not change the bill in any way. I ask that we put that in the bill.

The SPEAKER. Will the House agree to the amendment? Representative Ross.

Mr. ROSS. Thank you, Mr. Speaker.

Although I think this is an excellent amendment, because it exactly mirrors a provision that I suggested, is it not true that we need to suspend the rules in order to do this on third?

The SPEAKER. This is a technical amendment. It does not require a suspension of the rules.

Mr. ROSS. In that case, I urge a positive vote on this excellent amendment.

The SPEAKER. The Chair thanks the gentleman.

On the question recurring,
Will the House agree to the amendment?

The following roll call was recorded:

YEAS–198

Adolph	Gabig	Marshall	Ross
Argall	Galloway	Marsico	Rubley
Baker	Geist	McCall	Sabatina
Barrar	George	McGeehan	Sainato
Bear	Gerber	McI. Smith	Samuelson
Belfanti	Gergely	McIlhattan	Santoni
Benninghoff	Gibbons	Melio	Saylor
Bennington	Gillespie	Mensch	Scavello
Beyer	Gingrich	Metcalfe	Schroder
Biancucci	Godshall	Micozzie	Seip
Bishop	Goodman	Millard	Shapiro
Blackwell	Grell	Miller	Shimkus
Boback	Grucela	Milne	Siptroth
Boyd	Haluska	Moul	Smith, K.
Brennan	Harhai	Moyer	Smith, M.
Brooks	Harhart	Mundy	Smith, S.
Buxton	Harkins	Murt	Solobay
Caltagirone	Harper	Mustio	Sonney
Cappelli	Harris	Myers	Staback
Carroll	Helm	Nailor	Stairs
Casorio	Hennessey	Nickol	Steil
Causer	Hershey	O'Brien, M.	Stern
Civera	Hess	O'Neill	Stevenson
Clymer	Hickernell	Oliver	Sturla
Cohen	Hornaman	Pallone	Surra
Conklin	Hutchinson	Parker	Swanger
Costa	James	Pashinski	Tangretti
Cox	Josephs	Payne	Taylor, J.
Creighton	Kauffman	Payton	Taylor, R.
Cruz	Keller, W.	Peifer	Thomas
Curry	Kenney	Perry	True
Cutler	Kessler	Petrarca	Turzai
Daley	Killion	Petri	Vereb
Dally	King	Petrone	Vitali
DeLuca	Kirkland	Phillips	Vulakovich
Denlinger	Kortz	Pickett	Wagner
DePasquale	Kotik	Preston	Walko
Dermody	Kula	Pyle	Wansacz
DeWeese	Leach	Quigley	Waters
DiGirolamo	Lentz	Quinn	Watson
Eachus	Levdansky	Ramaley	Wheatley
Ellis	Longietti	Rapp	White
Evans, D.	Mackereth	Raymond	Williams
Evans, J.	Maher	Readshaw	Wojnaroski
Everett	Mahoney	Reed	Yewcic
Fabrizio	Major	Reichley	Youngblood
Fairchild	Manderino	Roae	Yudichak
Fleck	Mann	Rock	
Frankel	Mantz	Roebuck	O'Brien, D.,
Freeman	Markosek	Rohrer	Speaker

NAYS–0

NOT VOTING–0

EXCUSED–5

Bastian	Hanna	Keller, M.	Perzel
Donatucci			

The majority having voted in the affirmative, the question was determined in the affirmative and the amendment was agreed to.

On the question,
Will the House agree to the bill on third consideration as amended?

The SPEAKER. The House will be at ease.

The House will come to order.

On the question recurring,
Will the House agree to the bill on third consideration as amended?
Bill as amended was agreed to.

The SPEAKER. This bill has been considered on three different days and agreed to and is now on final passage.

(Bill analysis was read.)

The SPEAKER. The question is, shall the bill pass finally?

The Chair recognizes Representative Ross.

Mr. ROSS. Thank you, Mr. Speaker.

Back in 2004 when we passed the Alternative Energy Portfolio Standards, many of us were concerned about the effect that that would have in the long run on electricity pricing when the price caps came off. And over the next couple of years, I and others worked very hard on an idea to try and bring conservation and demand-side management forward as an alternative to reduce the cost of electricity when the price caps came off. A good deal of us worked on that and we made some significant progress on that over the last year or so, and I am pleased to see that much of what I was looking for in my legislation is contained in this bill as it currently is before us.

I am, of course, also disappointed, because it could be better. I am disappointed that we did not have more conversation, despite my efforts to reach across the aisle. And I would say that we have many speeches about bipartisanship, and I think they are important. But we have to also, in addition to having speeches about bipartisanship, we actually have to have conversations. We have to talk to each other, and I am disappointed that we did not have those conversations until after the voting was taken yesterday.

After the voting is taken, it is really too late. The conversations need to be had previous to that, when the language can be improved. It does not matter whose name is on this bill. When it goes to the Governor's desk, the names come off the bill and the language is left, and that is why it is important to improve the language, not with just one-half of the body but with the whole body, with every intelligent member participating fully and involved in the discussions.

I am hoping we are going to change. I am hoping we are going to start talking to each other in a useful way so that we can improve the quality of the legislation that we give to the public. It is important for the public, and I think that this is a good time to start making that change.

I urge a positive vote on this, and I urge all the members, Republicans, Democrats, Mr. Speaker, to work together more effectively in the future.

The SPEAKER. Representative Hutchinson.

Mr. HUTCHINSON. Thank you, Mr. Speaker.

Mr. Speaker, I rise in opposition to passage of HB 2200, and let me tell you why.

I believe that in its original, unamended form, before it came to the House floor, there were a lot of redeeming qualities in the bill. It did promote conservation, and that is a laudable goal for Pennsylvania, to try to conserve energy use. However, by the amendments passed yesterday, which mandated universal smart meters across Pennsylvania, that is a fatal flaw that makes this bill a bad idea for Pennsylvania. It is bad for the consumers of Pennsylvania who will have to pay for those smart meters, whether they save on their electric bills or not. It makes no sense whatsoever to force people to pay for those smart meters and then, in addition, still pay higher and higher utility bills.

It was said yesterday that if only 1 percent of the people used smart meters, we would have huge savings in energy use in Pennsylvania, and, Mr. Speaker, I agree with that statement. But my idea is, let us get the smart meters only to those 1 percent of the people and get this same savings in energy use. That is the smart way to move forward to promote energy conservation, to use technology like smart meters in a targeted and commonsense way instead of a mandated, across-the-board consumer tax – that is what it is, a couple hundred dollars per person – that will have to be paid to pay for these smart meters.

So after adding that fatal flaw to this bill, I think it is incumbent upon everyone in this chamber to vote against HB 2200, and I ask them to join me in that vote. Thank you, Mr. Speaker.

LEAVE OF ABSENCE

The SPEAKER. The Chair recognizes the minority whip, who requests that Representative Sam ROHRER be placed on leave for the remainder of the day. The Chair sees no objection. Leave will be granted.

CONSIDERATION OF HB 2200 CONTINUED

The SPEAKER. The Chair recognizes Representative George.

Mr. GEORGE. Mr. Speaker, again, I echo the gentleman, Mr. Ross—

The SPEAKER. If the gentleman will suspend.

The Chair will ask the members to please take their seats and quiet their conversations. Conferences will break up. Conferences will break up. The House will come to order.

Representative George is in order and may proceed.

Mr. GEORGE. Mr. Speaker, do you think there is a possibility they do not want to hear what I have to say?

The SPEAKER. I do not think that is a possibility, Representative.

Mr. GEORGE. Well, as I said at the start, I admire Representative Ross's courage to do the best thing for all whom we serve, regardless of principle or party, and I commend him for his positive approach to what we should do for our constituents in that HB 2200 gives utilities and consumers the framework that they must have to counter the looming increases in generation charges.

In a nutshell, HB 2200 institutes rewards rather than penalties for conserving energy. Under HB 2200, utilities would be required to reduce overall output by 2 1/2 percent and peak demand, when energy prices are at their highest, by 4 percent.

HB 2200 would direct the State Public Utility Commission to establish the criteria for implementing conservation and efficiency programs and to select a program administrator to oversee the program's implementation within each utility. Under HB 2200, programs would be designed to benefit all classes of ratepayers – all classes – from the homeowners and the renters to the largest of industrial users. For the utilities, HB 2200 would establish a clearly defined process for financial compensation for meeting performance benchmarks.

Other States have realized – hear this – other States have realized a $2 savings for constituents for every dollar invested by the utilities in efficiency measures. Currently, however, Pennsylvania ranks 44th among States in per capita spending on energy efficiency for utilities.

My colleagues, we thank you for your consideration of HB 2200. Thank you, Mr. Speaker.

The SPEAKER. Representative Preston.

Mr. PRESTON. Thank you, Mr. Speaker.

HB 2200 really takes us into the term of 2000. Last year when I had a hearing, I had a person who was involved in marketing and advertising and had talked to me about that she

did the first ad in 1985 for smart meters. Now, I do not know, but I had heard some gentleman previously talk about, well, we do not need to do this or do that – since 1985. It is time to move forward. It is time to get the business on today. Think of all the energy we could have conserved instead of listening to somebody with a laissez-faire attitude about, let us hold off; let us hold off; let us stop doing this. Let us just get this on today so that we can save energy for the future and the generations of tomorrow.

Let us vote 2200 today.

On the question recurring,

Shall the bill pass finally?

The SPEAKER. Agreeable to the provisions of the Constitution, the yeas and nays will now be taken.

The following roll call was recorded:

YEAS–152

Adolph	Gabig	Marsico	Samuelson
Argall	Galloway	McCall	Santoni
Barrar	George	McGeehan	Scavello
Bear	Gerber	McI. Smith	Schroder
Belfanti	Gergely	Melio	Seip
Benninghoff	Gibbons	Mensch	Shapiro
Bennington	Godshall	Micozzie	Shimkus
Beyer	Goodman	Milne	Siptroth
Biancucci	Grell	Moyer	Smith, K.
Bishop	Grucela	Mundy	Smith, M.
Blackwell	Haluska	Murt	Solobay
Boback	Harhai	Myers	Staback
Boyd	Harkins	Nailor	Stairs
Brennan	Harper	Nickol	Steil
Buxton	Helm	O'Brien, M.	Sturla
Caltagirone	Hennessey	O'Neill	Surra
Carroll	Hickernell	Oliver	Tangretti
Casorio	Hornaman	Pallone	Taylor, J.
Civera	James	Parker	Taylor, R.
Cohen	Josephs	Pashinski	Thomas
Conklin	Keller, W.	Payne	True
Costa	Kenney	Payton	Vereb
Cruz	Kessler	Petrarca	Vitali
Curry	Killion	Petri	Wagner
Cutler	King	Petrone	Walko
Daley	Kirkland	Phillips	Wansacz
Dally	Kortz	Preston	Waters
DeLuca	Kotik	Quigley	Watson
DePasquale	Kula	Quinn	Wheatley
Dermody	Leach	Ramaley	White
DeWeese	Lentz	Raymond	Williams
DiGirolamo	Levdansky	Readshaw	Wojnaroski
Eachus	Longietti	Reed	Yewcic
Evans, D.	Mahoney	Roebuck	Youngblood
Evans, J.	Major	Ross	Yudichak
Fabrizio	Manderino	Rubley	
Fairchild	Mann	Sabatina	O'Brien, D.,
Frankel	Mantz	Sainato	Speaker
Freeman	Markosek		

NAYS–45

Baker	Gillespie	McIlhattan	Reichley
Brooks	Gingrich	Metcalfe	Roae
Cappelli	Harhart	Millard	Rock
Causer	Harris	Miller	Saylor
Clymer	Hershey	Moul	Smith, S.
Cox	Hess	Mustio	Sonney
Creighton	Hutchinson	Peifer	Stern
Denlinger	Kauffman	Perry	Stevenson
Ellis	Mackereth	Pickett	Swanger
Everett	Maher	Pyle	Turzai
Fleck	Marshall	Rapp	Vulakovich
Geist			

NOT VOTING–0

EXCUSED–6

Bastian	Hanna	Perzel	Rohrer
Donatucci	Keller, M.		

The majority required by the Constitution having voted in the affirmative, the question was determined in the affirmative and the bill passed finally.

Ordered, That the clerk present the same to the Senate for concurrence.

* * *

The House proceeded to third consideration of **HB 949, PN 2933,** entitled:

An Act amending the act of July 10, 1990 (P.L.404, No.98), known as the Real Estate Appraisers Certification Act, further providing for real estate appraiser certification required, for State Board of Certified Real Estate Appraisers, for powers and duties of board, for application and qualifications, for reciprocity, for certification and licensure renewal, for disciplinary and corrective measures, for reinstatement, for reporting of multiple certification, for surrender of suspended or revoked certificate, for penalties and for injunctive relief.

On the question,

Will the House agree to the bill on third consideration?

Bill was agreed to.

The SPEAKER. This bill has been considered on three different days and agreed to and is now on final passage.

(Bill analysis was read.)

The SPEAKER. The question is, shall the bill pass finally?

Agreeable to the provisions of the Constitution, the yeas and nays will now be taken.

The following roll call was recorded:

YEAS–197

Adolph	Gabig	Marshall	Rubley
Argall	Galloway	Marsico	Sabatina
Baker	Geist	McCall	Sainato
Barrar	George	McGeehan	Samuelson
Bear	Gerber	McI. Smith	Santoni
Belfanti	Gergely	McIlhattan	Saylor
Benninghoff	Gibbons	Melio	Scavello
Bennington	Gillespie	Mensch	Schroder
Beyer	Gingrich	Metcalfe	Seip
Biancucci	Godshall	Micozzie	Shapiro
Bishop	Goodman	Millard	Shimkus
Blackwell	Grell	Miller	Siptroth
Boback	Grucela	Milne	Smith, K.
Boyd	Haluska	Moul	Smith, M.
Brennan	Harhai	Moyer	Smith, S.
Brooks	Harhart	Mundy	Solobay
Buxton	Harkins	Murt	Sonney
Caltagirone	Harper	Mustio	Staback
Cappelli	Harris	Myers	Stairs

Appendix O

SB 1107 (Pr. No. 2472) (Rereported) *(Concurrence)*

An Act amending Titles 23 (Domestic Relations) and 51 (Military Affairs) of the Pennsylvania Consolidated Statutes, further providing for modification of existing custody orders; and providing for protection of deployed members of the Pennsylvania National Guard and reserve components in child custody arrangements.

SB 1504 (Pr. No. 2454) (Rereported) *(Concurrence)*

An Act providing for the highway capital budget project itemization for the fiscal year 2008-2009 to be financed from current revenue or by the incurring of debt.

CONSIDERATION OF CALENDAR RESUMED

BILL ON CONCURRENCE IN HOUSE AMENDMENTS TO SENATE AMENDMENTS AS AMENDED

SENATE CONCURS IN HOUSE AMENDMENTS TO SENATE AMENDMENTS AS AMENDED

HB 1096 (Pr. No. 4527) -- The Senate proceeded to consideration of the bill, entitled:

An Act amending the act of November 10, 1999 (P.L.491, No.45), known as the Pennsylvania Construction Code Act, further providing for definitions; establishing the Uniform Construction Code Review and Advisory Council; and further providing for revised or successor codes and for training of inspectors.

On the question,

Will the Senate concur in the amendments made by the House to Senate amendments, as further amended by the Senate, to House Bill No. 1096?

Senator PILEGGI. Mr. President, I move that the Senate do concur in the amendments made by the House to Senate amendments, as further amended by the Senate, to House Bill No. 1096.

On the question,

Will the Senate agree to the motion?

The yeas and nays were required by Senator PILEGGI and were as follows, viz:

YEA-50

Armstrong	Fontana	O'Pake	Tartaglione
Baker	Fumo	Orie	Tomlinson
Boscola	Gordner	Piccola	Vance
Browne	Greenleaf	Pileggi	Washington
Brubaker	Hughes	Pippy	Waugh
Corman	Kasunic	Punt	White, Donald
Costa	Kitchen	Rafferty	White, Mary Jo
Dinniman	LaValle	Regola	Williams, Anthony H.
Earll	Logan	Rhoades	Williams, Constance
Eichelberger	Madigan	Robbins	Wonderling
Erickson	McIlhinney	Scarnati	Wozniak
Ferlo	Mellow	Stack	
Folmer	Musto	Stout	

NAY-0

A constitutional majority of all the Senators having voted "aye," the question was determined in the affirmative.

Ordered, That the Secretary of the Senate inform the House of Representatives accordingly.

THIRD CONSIDERATION CALENDAR RESUMED

BILLS ON THIRD CONSIDERATION AND FINAL PASSAGE

HB 2200 (Pr. No. 4526) -- The Senate proceeded to consideration of the bill, entitled:

An Act amending Title 66 (Public Utilities) of the Pennsylvania Consolidated Statutes, further providing for director of operations, secretary, employees and consultants; repealing provisions relating to office of trial staff; further providing for bureaus and offices; providing for other bureaus, offices and positions; further providing for electric utility definitions; providing for energy efficiency and conservation program and for energy efficiency and conservation; further providing for duties of electric distribution companies and for market power remediation; and providing for procurement, for additional alternative energy sources and for carbon dioxide sequestration network.

Considered the third time and agreed to,

And the amendments made thereto having been printed as required by the Constitution,

On the question,

Shall the bill pass finally?

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Bucks, Senator Tomlinson.

Senator TOMLINSON. Mr. President, I rise to ask for support for House Bill No. 2200 as amended by the Senate. I think this is very, very important legislation for our consumers today who consume power and energy in Pennsylvania. House Bill No. 2200 is, I think, a large step forward. The Governor of the State of Pennsylvania, Ed Rendell, has been a leader in a new energy policy, and this legislation contains many of those items in there.

It includes demand-side reduction, conservation, that I think is going to help the consumer, in the long run, to reduce the demand on power. We are requiring a reduction of 3 percent by the year 2013 and 4 1/2 percent for peak power, and I think that is extremely important as we go forward with an energy policy, Mr. President. It also contains language in there that we will have smart meters. It is not mandated, but it allows for the deployment of smart meters through a depreciation process, through new home construction process, and through the depreciation of 15 years, and for anyone who wants to purchase a smart meter which they feel will help them manage their electric load better.

I think probably the most important reason that we do this is the procurement language. As many of you know, we fought, in the last few months, trying to get mitigation for rate caps coming off. So that is a year or 2 away in some instances, and I think we have more time to fight that battle, but something that I think will help the consumer immediately will be the fact that we have new procurement standards. We no longer are going to use market pricing. We are going to use best pricing or least price for the consumer, and I think that helps the consumer in the end, when utilities are able to go out and compete for power as they purchase it for the distribution company.

I think that by offering these different tools and giving some latitude, people are not locked into buying power in 1 day for the rest of their contracts. Many of you are aware of the Pike County

situation, where after the episode of Katrina, Pike County and that utility up there were forced to buy their power the day after the hurricane, and of course, the rates were extremely high. Under our provisions here for procurement, we would be able to prevent that. And so for that reason, I think that would be a huge step forward in trying to bring electric rates down for the consumers in Pennsylvania.

I am disappointed. I fought hard to try to get mitigation. I do not think that is possible now, but I do not think that chapter is closed. I think that we are going to stand here and fight hard in these next 2 years and fight for mitigation or fight to make sure that any rate increases when the caps come off are not onerous for our consumers. But I think it is important today that we step forward and take these steps when it comes to demand-side reduction, to energy conservation, and to procurement, to make sure that we are moving forward with a very sensible energy policy in Pennsylvania.

I want to thank several people here. I want to thank Senator Boscola, my counterpart on the committee, for her hard fight and her cooperation. I want to thank my counterparts in the House, Representative McCall and Representative Preston. I want to thank our staffs. Fran Cleaver and Kathy Eakin have worked extremely hard, along with Bernie Kieklak and Christopher Craig, who have done an outstanding job, particularly, I think, in representing the interests of the consumer in this.

We are very, very fortunate in Pennsylvania to have some very strong utility companies, and we are, in fact, an exporter of power. We are, in fact, very energy-independent. We export probably 40 percent of the power we produce. Thirty-five percent of our power is produced by nuclear, and we are, of course, very, very rich in coal resources in Pennsylvania. So I think we have a great base in our energy policies and in our energy companies here to be able to go on and move into some of our alternative energies, to move into a better energy policy, as the Governor has asked for.

So I think this is a great compromise bill. It has been hard-fought. There are very, very strong and passionate positions on both sides of this issue. But I think it is time now to move forward, help the consumer, move forward with a forward-thinking energy policy that the Governor has put forward, and pass this bill today. So for that reason, Mr. President, I ask for a favorable vote on House Bill No. 2200 as amended by the Senate.

The PRESIDENT pro tempore. The Chair recognizes the gentlewoman from Northampton, Senator Boscola.

Senator BOSCOLA. Mr. President, as we all know, electric rate caps are scheduled to expire in Pennsylvania's five largest electric companies in 2010. And if we do nothing, if we do nothing to protect millions of electric customers from rate shock, the people we represent will see their bills go up by 30, 40, 50, and up to 70 percent in some areas, and that will be overnight.

Today, in House Bill No. 2200, we can finally do something to help millions of ratepayers hold on to more of their money instead of having to send it to their electric company. The procurement provisions contained in this bill will force power companies to purchase least-cost fuel instead of purchasing coal or natural gas or uranium at prevailing market rates, which is more expensive. It also gives Pennsylvania's Consumer Advocate the tools he needs to keep electric prices as low as possible in the future. That is why our Consumer Advocate endorses this bill today, and personally assured me late last night that passing House Bill No. 2200 today is the right thing to do.

The other major provision of this bill deals with energy conservation and some very important steps that we all need to take for electric use. So-called smart meters by themselves are not magically -- anyone's monthly electric bill is not going to go down just because you are getting a smart meter. That will not happen. But this new technology will reward customers who are smart enough to realize that they can use electricity when it is cheapest during off-peak hours and pay a lower rate. We also made sure that smart meters would not be mandated for every single ratepayer. Not only is that a smarter approach to smart meter deployment, but it will also save electric customers hundreds of millions of dollars paying for something that will not provide a real benefit in their own households.

There is also strong market manipulation language in House Bill No. 2200, and that is what Senator Mellow insisted on being part of this bill. He should be commended for that, and we should not overlook that critical provision, because it will insure that real competition will not be undermined by existing power companies manipulating the wholesale market or the retail market to their own advantage.

What is not contained in this bill, unfortunately, is a real rate relief mitigation plan that I think the Senate needs to pass eventually. As everyone in this Chamber knows, that is what I have been fighting for for the past 2 years, and I do not doubt anybody knows that I am passionate about it, and this is just the beginning of this fight. Now, have we reached an agreement on mitigation yet? No. Despite our best efforts and ongoing negotiations that lasted into early morning, we have not. But I believe we are getting there.

And I know for a fact that we are closer to real rate mitigation now than we were 2 weeks ago or 2 months ago or 2 years ago. If there is anyone who wants to dispute that, you just have to take my word for it. And you can ask Senator Pileggi and Senator Tomlinson. They both sat in marathon sessions, negotiating sessions, and they want what we all want. We want Pennsylvania power companies to put up their own money to make it easier for customers to afford the new deregulated electric rates in 2010 and 2011. To do that will cost billions of dollars, billions, billions, that the companies would have given to their shareholders or slickly added to their profits.

So real rate relief, not just some Christmas card program or a plan to add some coupons, stuff some coupons in your pocket and save $10 off your next purchase of a $30,000 solar panel, that is not real rate relief. Just because it did not all come together at the eleventh hour like it does in the movies does not mean that we are done and that mitigation is dead. I have too much respect for Senator Pileggi, Chairman Tomlinson, Senator Fumo, and Senator Mellow to doubt that we will have a mitigation plan in place before rate caps come off. I also know that Governor Rendell will not rest until we have a mitigation plan in place that helps the ratepayers, small businesses, and our most vulnerable industries from this rate shock.

Together, we have put a tremendous amount of time into making this bill good for ratepayers and good for Pennsylvania. I

want to thank Senator Pileggi and Kathy Eakin and Dave Woods on his staff, Senator Tomlinson for going above and beyond the call of duty on this very, very complicated issue, and of course, my shopping partner, Fran Cleaver on his staff. I want to also thank Senator Mellow and Senator Fumo for their faith in me during these times when the obstacles seemed almost insurmountable, and both Gladys Brown and Christopher "Wing Man" Craig, who distinguished themselves in the heat of so many battles here and so many late, late nights and early mornings of hard, hard work.

Our job is not finished. There is still a lot of work to do. As of today, we have 449 days left to get it done before the rate caps come off, and get it done right. And as of today, after talking to Governor Rendell, he had indicated that he will take the bus that he goes around in across the State, and we are going to talk rate mitigation come January and February and take that bus to every corner of the State until we get a rate mitigation plan in effect before 2010.

Thank you, Mr. President. I thank everybody for all their hard work, and let us try to move forward. Thank you.

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Schuylkill, Senator Rhoades.

Senator RHOADES. Mr. President, first, I want to applaud everyone who has worked so hard on this particular issue - Senator Tomlinson and his staff, Senator Pileggi, and everyone who has been involved and committed to this. I really do think we have a good piece of legislation, but I am going to agree with the gentlewoman from Northampton, because I will tell you what, 10 years ago may have been--and I say may have been--the first and the only time I voted for deregulation.

But the decision I made then was based on what I perceived to be the statements made to me, and as I saw it, that this would result in lower or at least the same level playing field rates for consumers. There was no talk then of a cost increase. There was no talk of a projection increase. There was no talk of a 35- or 40-percent increase at the end. And we still allowed the stranded costs. Then I look over that 10-year period, and the local company I have has made billions of dollars of profit, has been able to distribute very fine dividends to its stockholders. That is fine. That is excellent. That is good.

We have gone from a regulated monopoly to an unregulated monopoly, and I have problems with that. I do not want to move on any piece of legislation until I see the mitigation piece and how it is going to affect the consumers. Then I will say we should do the whole thing. I want to see how it affects the consumers, what it is going to mean to them, and how we are going to put it in place. I know, I hear, well, we will give them a 75-percent break, then a 50-percent break, then a 25-percent break, but as a company borrows that money, you know who is going to end up paying the interest on it. Or I will tell you what, you put your deposit in, and I will give you 6 percent now. Why do I have to go through that gyration when I should have had an understanding, at least it was projected to me, that all things will remain basically the same, except now, you will be able to go out and be at least more competitive. I have not seen that.

Another grave concern I have, too, is I want to make sure that PPL retirees, and those are the people I am talking about, have their pension system put in a separate account. I do not want to end up like Bethlehem Steel, where it ended up that they closed down, and then I had people looking for pensions. I want these kinds of things to be understood, and I want to know what the consumer is really going to have to pay before I can pass on anything. So for that reason, I will be voting "no."

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Allegheny, Senator Ferlo.

Senator FERLO. Mr. President, with all due respect to all the self-congratulatory accolades being expressed, I am very disappointed in the final outcome represented in this bill, House Bill No. 2200, and it quite honestly represents a sucker punch in the face of electric ratepayers, both individual homeowners and ratepayers at a residential level, as well as those in the small business community, and even larger businesses that are going to have to continue to bear exorbitant rate hikes and rate increases when it comes to electricity.

I am disappointed mostly because as a benchmark piece of legislation, this legislation does not admit or declare in some type of form the horrendous failure that so-called electric choice has been. The State legislature should be held accountable for a bad decision made over 10 years ago in creating so-called electric choice. The only electric choice we have, basically, is to continue to pay exorbitant electric rates.

There is no true competition. There is basically an almost fraudulent methodology by which electricity is purchased on the PJM marketplace. We have companies going to Wall Street, blatantly and with very clear annual statements and reports, even documenting the amount of profiteering that they are going to make off the backs of ratepayers. And as one of my most brilliant colleagues reported at a press conference in June, the rate hikes will basically represent probably the largest tax increase on the backs of Pennsylvania residents and businesses, although it will not be in the form of taxes. It will come through the back door in the form of higher electric rates.

Needless to say, I am less than pleased. I have three amendments here. Two deal, actually, with the issue that everybody seems to say they want, and that is rate mitigation. Well, I have two amendments right here. One is to extend the rate caps to 2013. Another one is to implement a more modified rate cap over a 5-year period at 9 percent per year, which would at least create less pain for residents and small businesses. I am also concerned, at a third level, about the fact that this legislature, just 2 1/2 years ago, removed the so-called Chapter 14 provisions, which at least provided some consumer protections under the Public Utility Commission code.

We have had over 60 house fires in this State in the last 2 years since the removal of the Chapter 14 consumer rights provisions, where people have actually died in their houses, people trying to keep gas and light on either illegally or inappropriately, or during the winter months, trying to use kerosene heaters, lighting wood and fuel. That is a horrendous situation, and given the harsh reality of the economics of this country right now, today, and what everybody admits is going to be hard times for the next several years, I find it reprehensible that we are not able to proceed with some level of rate cap mitigation in this bill and, as well, some restoration of consumer rights to provide opportunities to ban winter shutoffs, to allow a more rational and reasonable reconnect policy as to how much people have to pay to get

their gas and light put back on by the utility company, to allow the Public Utility Commission to reenter as the mediator between the utility companies' narrow self-interests and the ratepayer. Right now, say you are on the phone with some operator, you do not even know if the operator works in China or India or Asia, and you are trying to argue about some consumer right that you feel you have to try to get a more reasonable reconnection. You have no rights whatsoever. We should restore that. And I have amendments that do that.

It is clear, however, that there are important elements in this bill that I certainly would not want to oppose or argue with, because I have fought hard. I have fought hard for some of the provisions that are in this bill, including the provision for the least-cost purchase price, and that is very important. And there are other elements of this bill that none of us would want to argue about, because, in fact, they are moving forward in trying to create a more level playing field between outright profiteering and the ability of small businesses and residences to survive in our Commonwealth with a needed, basic right to electricity.

So I am betwixt and between. There is not majority support to support these amendments, so I am not going to go forward in a Don Quixote fashion and offer amendments on the mitigation side of the equation, and I believe that come January, when people will be freezing to death, maybe there will be an ability for both sides of the aisle, in a nonpartisan way, to come together to talk about restoring some of the consumer protections.

So at this eleventh hour, as my colleague reported, I think it is important that we move forward on the bill, but I do think it is inappropriate that we were not able--and we keep saying we are rushed, it is the eleventh hour. I mean, we do not set the agenda on this side of the aisle. You all do on the aisle opposite. I do not know what says that we have to leave today. I know there is an election coming up in a few weeks. I do not know what says that we cannot reconvene to really deal with the rate cap mitigation. It is not rocket science.

So I am very disappointed, but I think it is important that we try to move forward on this bill, and accordingly, Mr. President, I will not be offering the amendments. Thank you.

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Beaver, Senator LaValle.

Senator LaVALLE. Mr. President, as most people probably know, up until about an hour ago, I was prepared to vote "no" on this bill simply because I really wanted to see rate cap mitigation included. I thought that was the direction we were going. Since that time, and I want to be on record, the Governor has assured us that beginning in January, he will do all that he can to address that issue. Senator Boscola has been committed to addressing the issue and working as hard as she can possibly work to get the rate cap mitigation included, or at least address that issue next year. So although I am not very happy with not having it in now, I am prepared to vote "yes."

As Senator Ferlo said, there are some good things in the bill. However, you know, I am not going to be here next year, so the guy who takes my place when the rates go sky high, he can take all the complaining, and I will be one of the complainers. So, hopefully, we will do something to relieve him of that pain.

Thank you, Mr. President.

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Philadelphia, Senator Fumo.

Senator FUMO. Mr. President, I want to thank Senator Ferlo for not offering his amendments today, because I think that would have ultimately denied us the opportunity of voting on House Bill No. 2200. I want to thank Senator LaValle and the other Members of my Caucus who were negative and are now positive. But I also want to echo some of the comments, in two particular areas.

This is not a bad bill. This is not a vote against mitigation, which we all seem to want, in one form or another, but this is a step in the right direction. The procurement portions of this bill will result in immediate ratepayer savings. As was mentioned earlier, and I just want to reemphasize, this legislation will change the current law and force utilities to purchase their electricity at the least possible rate, the lowest-cost rate, not the phony market rate that the current law allows them to do.

Secondly, it will require them to have a mix in their portfolio of long-term, short-term, and middle-term contracts, which will ultimately also benefit the consumer. It will require them, in that portfolio, to have at least some long-term contracts, more than 4 years, but not less than 20. And as was also said, the amendment will impose significant safeguards intended to prevent market manipulation and self-dealing.

In addition to that, the bill has been amended to say that the maximum fine will not be $5 million, which to some of these large utilities is just merely the cost of operation, but rather $20 million, which is some pain.

Then, on the demand side, we do have long-term goals and positions that will save us energy in the long run. But like everything else, no one wants to hear about that, because it is not going to really kick in for 8 to 10 years. But it is there, and future generations will be the beneficiaries of that. In addition, we did not mandate smart meters, but we made them optional. We did say in new construction, where they really are practical, they will be put in.

So this is not a bad vote for anybody. What has been explained to me in the main argument that I have heard is that, gee, we blew an opportunity. We had some leverage. We had no leverage with utility companies on this bill. This was similar to the guy who stands there with a gun to his head and says to the other guy, if you move, I will shoot. There was no leverage against utility companies in this bill.

Next, I want to address, because I, too, will not be here, but I was here in 1996 when I not only voted against deregulation, I predicted that there would not be any competition, and regrettably, my prediction has come true. But then I sued PECO, and I was the one who got the 8-percent reduction and the current caps that we have. Now I am beginning to think it was the right thing to do. We saved people billions of dollars, but when it comes off, they are going to be upset.

In addition to that, the people have not yet gotten the message. That is why I think the utility companies have made a major strategic mistake by not attempting to resolve mitigation at this stage. What is going to happen is every day they delay in coming to the table, and every day we do not do anything about mitigation in the next Session, more and more pressure is going to be built up

against them. And I know the reality here, having served here over 30 years. We are usually dealing with this lobbyist versus that lobbyist, this union versus this construction company, and all these special interests. For the first time, when this begins to become a reality, the power base will not be with any lobbyist, will not be with any special interest group. It will be with those who are with the people. The people will rebel. The people will demand mitigation far in excess, far in excess to what we are willing to compromise with today. But the utilities will ultimately pay for that arrogance.

Lastly, because I will not be here, the way to serve consumers is not to get $1.5 billion, $2 billion, $5 billion, $10 billion, $20 billion into this, because we are now dealing with an unregulated utility industry. We have never done that before. They were always regulated, until 1996, when we deregulated, and then immediately, they had the caps imposed upon them so no one ever suffered or saw the reality of an unregulated monopoly, and that is what we have here. So when that happens, getting $1 billion or $10 billion is not going to help, because they are not regulated. They will just get it back again. It is a shell game. The only real way to protect the consumer is to devise a scheme that would have in it some sort of index with a ceiling that would go forth in perpetuity, and that ceiling might be inflation plus 2 percent, 3 percent, or whatever. But that will do two things. That will give consumers predictability in where their rates are going, it will protect them from the gouging, and it will also give utility companies predictability. That should be the goal you strive for in the next Session.

But in the end, voting for this bill is a major step forward, and this will save consumers and ratepayers money right now. It is not that we are not doing anything for them. We are. We would like to do more. We will do this now, given the reality. So I urge everyone to vote in the affirmative, and from what I understand on our side of the aisle, that will be a reality. I am very happy about that, and I want to thank my colleagues for that, and I would hope on the other side that we can get very near that unanimous number as well, to show the public that we do care, that we do have concerns for what is going to hit them. Because right now, they are getting beat up every which way from Sunday with the stock market, with their IRAs, savings accounts, the cost of food, the cost of gasoline, the cost of heating oil. We can help them with this. This is a step in that direction, and we should do more, and I am positive we will do more in the next Session.

Thank you, Mr. President.

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Bucks, Senator Tomlinson.

Senator TOMLINSON. Mr. President, I will be brief. I just want to reiterate that the utilities were never held at leverage. The utilities were never who we could get anything out of. It was always the Governor's proposal on energy. It was the Governor whom I was looking forward to bringing in to help us, against the utilities, to bring about mitigation. The Governor stepped up, the Governor stepped in, and the Governor had meetings.

The Governor called in all the CEOs and executives from the utility companies. I was in some of those meetings, and my colleagues from the other side of the aisle were in some of those meetings, and we tried very, very hard. And some utilities stepped up. Some utilities offered some plans. Some utilities did not. I do not think it is something we can do piecemeal. I do not think it is something we can do with one utility and not with another utility. We just did not get all of the utilities together. But that is not a reason not to vote for this legislation.

This legislation-- I cannot believe that the utilities can be happy about the procurement language that we are about to propose. I think this procurement language helps the consumer, gives the PUC oversight over these contracts, allows them to look at these contracts to make sure that there is not any manipulation in the contracts. So I think we have given more tools to the consumer by allowing this.

Right now, there are actually two cases before the PUC. If we vote this out and the Governor signs this, that will give the PUC the power to actually help the consumer in those two rate cases because we changed the standards from market to best price or least price for the consumer, instead of market price. So I think it is extremely important to the consumer that we move this forward. It is extremely important when we start moving this energy policy into the new technologies, into the meters. Not everyone believes in universal meters and mandatory meters, but it is a technology that we have to move into. It is a technology that I think, in the future, is going to show more benefit to the consumer. And certainly, we should start to manage our demand side. We have to bring that peak power load down.

So there is a lot of good in this legislation. It is extremely important, I think, that we move forward, and the fight is not over. I want to thank Senator LaValle for his passion in the meetings that we have had on this. He has done a wonderful job standing up for the consumer. I want to thank Senator Ferlo for his passion, and I know he is going to continue to be here to help us fight that fight. But the leverage is not on this legislation, the leverage was on the Governor holding up his legislation to help me leverage the utilities. The Governor has done that, and I am confident the Governor is going to continue to help us fight the utilities and fight and bring about an equitable settlement with them.

So, with that, I think this is a very good bill. It is a good compromise bill. I think the administration has given up a lot to get this done, and I think we have given up a lot to get this done. Not everybody is totally happy with this. I know the Governor would like to have seen a little bit more. I would like to have seen a little bit more. I think it is a good compromise bill, and I ask for an affirmative vote. I would also like to thank Senator Fumo, whom I did not mention before, who has worked very, very hard to try to bring this thing together. And I thank Senator Fumo very much for his help on this.

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Delaware, Senator Pileggi.

Senator PILEGGI. Mr. President, I will be brief. I do not want to repeat all of the comments that have been made, many of them valid. I do want to address a couple of comments made, the comments by Senator Ferlo regarding the shutoff legislation that was contained in an amendment he planned to offer. I had told him privately, and I will repeat publicly, that I am willing to work with him on that important issue as we move toward the next Session, and hopefully we can reach an improvement in the cur-

rent law as it pertains to people facing both shutoff notices and the difficult task of being reconnected to utilities once they go through a shutoff process.

As to the issue of mitigation, I share Senator Boscola's comments as to the importance of that litigation being worked on and addressed here. I have said publicly that that was probably the most important topic that we needed to address in the various topics of energy legislation. Unfortunately, we simply were not able to reach an agreement on legislation to deal with that now, but I will continue to work with Senator Boscola and the other Members of the Senate who are interested in this topic. It is something that we absolutely have to do for consumers in Pennsylvania going forward.

I do want to commend Senator Tomlinson for his leadership on this issue and his patience over, now, almost 2 years in working through these issues; Senator Boscola and the leadership on the other side of the aisle, Senator Mellow and Senator Fumo, in working through these difficult issues; and also their staffs who worked very long hours. Although not complete because we do not have the mitigation legislation as part of this package, I think this is a tremendous improvement in the law in Pennsylvania on demand-side management and on procurement, and it is certainly something worthy of support by every Member of this body. I urge an affirmative vote.

Thank you, Mr. President.

LEGISLATIVE LEAVE

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Delaware, Senator Pileggi.

Senator PILEGGI. Mr. President, I request a legislative leave for Senator Punt.

The PRESIDENT pro tempore. Senator Pileggi requests a legislative leave for Senator Punt. Without objection, the leave will be granted.

And the question recurring,
Shall the bill pass finally?

The yeas and nays were taken agreeably to the provisions of the Constitution and were as follows, viz:

YEA-47

Armstrong	Fumo	O'Pake	Tartaglione
Baker	Gordner	Orie	Tomlinson
Boscola	Greenleaf	Piccola	Vance
Browne	Hughes	Pileggi	Washington
Brubaker	Kasunic	Pippy	Waugh
Corman	Kitchen	Punt	White, Donald
Costa	LaValle	Rafferty	White, Mary Jo
Dinniman	Logan	Regola	Williams, Anthony H.
Earll	Madigan	Robbins	Williams, Constance
Erickson	McIlhinney	Scarnati	Wonderling
Ferlo	Mellow	Stack	Wozniak
Fontana	Musto	Stout	

NAY-3

Eichelberger	Folmer	Rhoades

A constitutional majority of all the Senators having voted "aye," the question was determined in the affirmative.

Ordered, That the Secretary of the Senate return said bill to the House of Representatives with information that the Senate has passed the same with amendments in which concurrence of the House is requested.

HB 2294 (Pr. No. 4525) -- The Senate proceeded to consideration of the bill, entitled:

An Act providing for the licensure of persons providing debt management services and for the powers and duties of the Department of Banking; requiring surety bonds; prohibiting certain fees and costs; providing for debt management plans; and prohibiting certain acts by persons providing debt management services.

Considered the third time and agreed to,

And the amendments made thereto having been printed as required by the Constitution,

On the question,
Shall the bill pass finally?

The PRESIDENT pro tempore. The Chair recognizes the gentleman from Allegheny, Senator Costa.

Senator COSTA. Mr. President, I offer remarks for the record.

The PRESIDENT pro tempore. The remarks will be spread upon the record.

(The following prepared remarks were made part of the record at the request of the gentleman from Allegheny, Senator COSTA:)

Mr. President, I rise in support of this bill and to make a few brief remarks.

First, I would like to thank Senator Browne, Senator Greenleaf, Senator Stack, and Senator Fumo for their work on this important piece of legislation. Their efforts helped to address many of the concerns expressed by nonprofit consumer credit counseling agencies and made this bill a much better product.

For the first time, this legislation establishes a regulatory framework governing consumer credit counseling agencies, both for-profit and nonprofit agencies. We are in the midst of one of the greatest financial crises in our nation's history. A large part of the problem we are experiencing has to do with consumer debt. For better or worse, many in our communities have gotten in over their heads. In this atmosphere, many will rely on credit counseling agencies to provide advice and guidance, as well as assistance to put them into a debt management or debt settlement program.

Now is a great time for this legislation because it will impose strong regulation through the Department of Banking on the entities that will provide this important advice and services to consumers. Currently, there is no requirement to be licensed to offer debt management services or debt settlement services in Pennsylvania.

The bill would require that those offering debt management services be licensed, bonded, and certified. Further, the bill offers significant enforcement powers to the Department of Banking as well as remedies for aggrieved persons. The bill sets limitations on fees a consumer may be charged. This is an important consumer protection change to the law, as there currently are no limitations on the fees a consumer may be charged.

The legislation requires entities offering debt management services or debt settlement services to be licensed by the department and to operate according to regulations promulgated by the department. Those offering debt management services would also be required to renew their license on a yearly basis.

The application for a license would require the applicant to disclose any ownership interest of any officer, director, agent, or employee in an

Appendix P

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA PUBLIC UTILITY COMMISSION
P.O. BOX 3265, HARRISBURG, PA 17120

IN REPLY PLEASE REFER TO OUR FILE
Ch. Corrsp. #2018.051

March 20, 2018

Monica Smith and Mike Williams
32 Kestrel Street
Kutztown, 19530

Re: Objection to Smart Meter installation

Dear Ms. Smith & Mr. Williams:

I am counsel to the Pennsylvania Public Utility Commission ("Commission"). I am in receipt of your letter which details why you object to the installation of a smart meter on your property. Your letter was addressed to Gladys M Brown, Chairman of the Commission. I am responding to your letter on behalf of Ms. Brown and the Pennsylvania Public Utility Commission.

The Commission has ruled on many proceedings regarding this subject matter. It has done so based on the specific issues in each case and within the bounds of applicable law. Your general contention that the Commission is not lawfully implementing Act 129 requirements for smart meters is incorrect. Until the General Assembly amends Act 129 or an appellate court rejects the Commission's interpretation of Act 129, the Commission will continue to adjudicate smart meter installation disputes based on the existing law and the facts of each case.

Sincerely,

Rhonda L. Daviston

Rhonda L. Daviston
Assistant Counsel

cc: Arlene MacMillan,
Chairman Brown's Office
Gov. Wolf's Office (COR.0395929)

Appendix Q

PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17105-3265

Public Meeting held April 15, 2010

Commissioners Present:

James H. Cawley, Chairman, Statement
Tyrone J. Christy, Vice Chairman, Dissenting
Wayne E. Gardner, Statement
Robert F. Powelson

Joint Petition of Metropolitan Edison Company, Pennsylvania Electric Company and Pennsylvania Power Company for Approval of Smart Meter Technology Procurement and Installation Plan

Docket No. M-2009-2123950

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OPINION AND ORDER

BY THE COMMISSION:

I. Introduction

Before the Pennsylvania Public Utility Commission (Commission) for consideration and disposition are the Initial Decision (I.D.) issued in these proceedings by Administrative Law Judge (ALJ) Susan D. Colwell on January 28, 2010, and the Exceptions filed with respect thereto. Specifically, Exceptions have been filed by Metropolitan Edison Company (Met-Ed), Pennsylvania Electric Company (Penelec) and Pennsylvania Power Company (Penn Power) (collectively, FirstEnergy or the Companies); the Pennsylvania Department of Environmental Protection (DEP); the Office of Consumer Advocate (OCA); and the Office of Trial Staff (OTS). Reply Exceptions have been filed by the Met-Ed Industrial Users Group, the Penelec Industrial Customer Alliance and the Penn Power Users Group (collectively, MEIUG *et al*.); the OTS; the OCA; the Companies; and the Office of Small Business Advocate (OSBA). For the reasons set forth herein, we will adopt the ALJ's Initial Decision, as modified by this Opinion and Order.

V. Discussion

In Commission proceedings, the proponent of a rule or order bears the burden of proof. 66 Pa. C.S. § 332(a). To satisfy that burden, the proponent of a rule or order must prove each element of its case by a preponderance of the evidence. *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Cmwlth. 1990). A preponderance of the evidence is established by presenting evidence that is more convincing, by even the smallest amount, than that presented by the other parties to the case. *Se-Ling Hosiery v. Margulies*, 364 Pa. 45, 70 A.2d 854 (1950). Additionally, this Commission's decision must be supported by substantial evidence in the record. More is required than a mere trace of evidence or a suspicion of the existence of a fact sought to be established. *Norfolk & Western Ry. Co. v. Pa. PUC,* 489 Pa. 109, 413 A.2d 1037 (1980).

We note that any issue or Exception that we do not specifically address herein has been duly considered and will be denied without further discussion. It is well settled that we are not required to consider expressly or at length each contention or argument raised by the Parties. *Consolidated Rail Corporation v. Pa. PUC*, 625 A.2d 741 (Pa. Cmwlth. 1993); *see also, generally, University of Pennsylvania v. Pa. PUC*, 485 A.2d 1217 (Pa. Cmwlth. 1984).

A. Non-Cost Issues

1. Deployment Process and Timeframe

a. FirstEnergy's Plan

As stated previously, the Companies' Plan contains both a short-term plan and a long-term time line based on information currently available. Joint Petition at ¶ 9; FirstEnergy MB at 3. The Companies intend to use the Assessment Period to assess

needs, select technology, secure vendors, train personnel, and install and support test equipment. The Companies anticipate that the vendor and selection process will start in September, 2010 and continue for almost ten months. The Companies will then conduct an evaluation of the current legacy systems to assess network design. This task is expected to commence in January, 2011, and be completed before the end of 2013. FirstEnergy MB at 4. The Companies expect to submit the Deployment Plan to the Commission for approval in April 2012, and they project that the Commission will approve the Deployment Plan about October 2012 (when the Grace Period expires). Plan at 6.

The Companies currently anticipate commencing the build-out of necessary infrastructure in April, 2013. They will then perform a technical trial involving 5,000 to 10,000 meters prior to December 31, 2013. The Companies anticipate completing the build-out of necessary infrastructure approximately March 2016. They will then "de-bug" the system with at least 60,000 meters. Full scale deployment of smart meters is expected to occur in a tiered roll out beginning about April 2017, and ending about March 2022. Joint Petition at ¶¶ 25-26; Plan at 6.

b. ALJ's Recommendation

The ALJ approved the deployment timeframe set forth in the Companies' Plan. The ALJ found that the *Implementation Order* is not a regulation and does not have the full force and effect of law. Instead, it acts as a policy to provide guidelines to EDCs regarding the Commission's expectations about smart meter plans. The ALJ found the Companies' proposed time frame for deployment reasonable. I.D. at 19-23.

November 24, 2023

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120

RE: **Docket Nos. F-2019-3008809** and **F-2019-3008832**

Secretary Chiavetta:

Enclosed for filing are the Complainants' *Reply Exceptions*, including *Exceptions to the Initial Decision of ALJ Elizabeth Barnes* and *Exceptions to the Interlocutory Order Issued on May 26, 2020 by Administrative Law Judge Elizabeth H. Barnes Granting PPL Electric Utilities Corporation's Motion In Limine And Motion For Sanctions* in the above-referenced proceeding.

Respectfully submitted,

John Holder, Janet Holder

Docket Nos. F-2019-3008809 and F-2019-3008832

CERTIFICATE OF SERVICE

We hereby certify that true and correct copies of Complainants' *Reply Exceptions*, including *Exceptions to the Initial Decision of ALJ Elizabeth Barnes* and *Exceptions to the Interlocutory Order Issued on May 26, 2020 by Administrative Law Judge Elizabeth H. Barnes Granting PPL Electric Utilities Corporation's Motion In Limine And Motion For Sanctions* have been served upon the following persons in the manner indicated, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant):

VIA ELECTRONIC MAIL

Kimberly A. Klock, Esq.
Michael J. Shafer, Esq.
PPL Services Corporation
Two North Ninth Street
Allentown, PA 18101

Devin T. Ryan, Esq.
Garrett P. Lent, Esq.
Post & Schell PC
17 North 2nd Street
12th Floor
Harrisburg, PA 17101-1601

Curtis Renner, Esq.
1901 Pennsylvania Ave NW
Suite 1005 ENS
Washington, DC 20006

Administrative Law Judge Charece Z. Collins
400 North Street
Harrisburg, PA 17120

Commission's Office of Special Assistants (OSA)
ra-OSA@pa.gov

Date: November 24, 2023

John Holden Janet Holden

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

John and Janet Holder,	:	
	:	
Complainants,	:	
	:	
v.	:	**Docket No. F-2019-3008809**
	:	
PPL Electric Utilities Coporation,	:	
	:	
Respondent,	:	
	:	
June Maculesky,	:	
	:	
Complainant,	:	
	:	
v.	:	**Docket No. F-2019-3008832**
	:	
PPL Electric Utilities Corporation,	:	
	:	
Respondent.	:	

REPLY EXCEPTIONS

INCLUDING EXCEPTIONS OF COMPLAINANTS JOHN AND JANET HOLDER AND JUNE MACULESKY TO THE INTERLOCUTORY ORDER ISSUED ON MAY 26, 2020 BY ADMINISTRATIVE LAW JUDGE ELIZABETH H. BARNES GRANTING PPL ELECTRIC UTILITIES CORPORATION'S MOTION IN LIMINE AND MOTION FOR SANCTIONS

AND

EXCEPTIONS OF COMPLAINANTS JOHN AND JANET HOLDER AND JUNE MACULESKY TO THE INITIAL DECISION OF ADMINISTRATIVE LAW JUDGE ELIZABETH H. BARNES DATED SEPTEMBER 22, 2020 AND FILED ON OCTOBER 14, 2020

Dated: November 24, 2023

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I. INTRODUCTION

Pursuant to Section 5. 533 of the Commission's regulations, 52 Pa. Code § 5.33, Complainants John and Janet Holder and June Maculesky hereby submit these Exceptions to **(1)** the Interlocutory Order Granting PPL Electric Utilities Corporation's Motion in Limine and Motion for Sanctions, issued on May 26, 2020, and **(2)** the Initial Decision of Administrative Law Judge Elizabeth H. Barnes, dated September 22, 2020 and filed on October 14, 2020.

(1) A. INTERLOCUTORY ORDER GRANTING SANCTIONS

In their **Answer in Opposition to Motion for Sanctions** (https://www.puc.pa.gov/pcdocs/1660744.pdf), and in their **Motion to Remove Sanctions** (https://www.puc.pa.gov/pcdocs/1674878.pdf), their **Reply to Respondent's Answer in Opposition to Motion** (https://www.puc.pa.gov/pcdocs/1677941.pdf**),** and their **Amended Motion to Remove Sanctions** (https://www.puc.pa.gov/pcdocs/1678681.pdf), the Complainants have shown clearly and conclusively that Respondent PPL Electric's argument in support of its Motion for Sanctions was logically incoherent and unsound on its face and, based entirely upon specious reasoning, was therefore completely without merit. The Complainants' medical records absolutely were NOT, any more than were their drivers' licenses, materially relevant to their Complaint, and ALJ Barnes, by accepting the Respondent's fallacious argument, erred in failing to recognize or acknowledge that fundamental fact.

By illogically concluding, in her interlocutory Order, that merely because the Complainants had not provided copies of their medical records in response to PPL Electric Utilities' Interrogatories to Complainants Set I, No. 4, the Complainants "will not experience any medical conditions or issues from the installation of PPL Electric's AMI meter," ALJ Barnes thus erred in granting PPL Electric's Motion for Sanctions. (See Order Granting PPL Electric Utilities Corporation's Motion in Limine and Motion for Sanctions, https://www.puc.pa.gov/pcdocs/1664299.docx , Page 2, Order No. 4.)

Even though we, the Complainants, have not provided our medical records, we have every right under due process, and through means of argumentation and cross-examination, to challenge fully the safety and/or unreasonableness of PPL Electric's AMI meters pursuant to 66 Pa. C.S. § 1501.

However, the sanctions that unjustly and unjustifiably have been imposed by ALJ Barnes upon the Complainants have profoundly adversely affected the Complainants' ability to litigate their case in all subsequent proceedings, including the evidentiary hearing held on August 6, 2020. Because of the sanctions, the Complainants specifically were precluded from cross-examining the Respondent's expert witnesses and from asserting any claim or entering any evidence into the record that would support allegations of unreasonableness of the installation of PPL Electric's smart meters insofar as such were to concern issues of health and safety.

The Complainants consequently have been unjustly deprived of fully exercising their rights under due process, with the result that the Complainants' case has suffered severe prejudice and has been obstructed and encumbered with an utterly incomplete record, as reflected in the Initial Decision of ALJ Barnes.

Additionally, the Commonwealth Court has concluded that Act 129 does not preclude accommodations of customers' health concerns, **regardless of proof of harm**. (*Povacz et al. v. Pennsylvania Public Utility Commission*, No. 492, C.D. 2019.) As will be further explained in this document, because both the Respondent's Interrogatories request for the production of Complainants' medical records and the ALJ's Order granting PPL Electric's Motion for Sanctions were erroneously predicated on requiring the Complainants to produce their medical records in order to pursue their due process right to challenge the safety and/or reasonableness the installation of PPL Electric's AMI smart meters, it is appropriate and lawful that the ALJ's Interlocutory Order granting sanctions be reversed and the sanctions be removed.

(1) B. INTERLOCUTORY ORDER GRANTING MOTION IN LIMINE

In both their **Amended Complaint** (https://www.puc.pa.gov/pcdocs/1636175.pdf) and their **Motion in Opposition to PPL Electric's Motion in Limine** (https://www.puc.pa.gov/pcdocs/1660960.pdf), the Complainants brought forth a voluminous amount of highly relevant, highly credible and reliable evidence of definite probative value which would constitute a preponderance of evidence acceptable to any reasonable mind that forced, chronic, long-term exposure, even at very low levels, to the radiofrequency radiation and RF fields produced by PPL Electric's AMI wireless smart meters poses a non-negligible, substantive risk to health and safety, and it is therefore absolutely NOT reasonable for either PPL Electric or the Commission effectively to compel customers to endure such exposure in perpetuity as a condition of receiving electric service.

A substantial number of the evidentiary exhibits brought forth by the Complainants in both their **Amended Complaint** and **Motion in Opposition to PPL Electric's Motion in Limine** were, in accordance with 52 Pa. Code § 5.406(a)(1) and/or §5.406 (a)(2), **public documents**.

In her interlocutory Order granting PPL Electric's Motion in Limine, issued in indiscriminate, blanket fashion, and with no reason given, the ALJ erred in denying any and all of the Complainants' exhibits that fully satisfied either or both of the criteria set forth in §§ 5.406(a)(1) and 5.406(a)(2).

(2) INITIAL DECISION

On page 3 of her May 26, 2020 Order Granting PPL Electric's Motion in Limine and Motion for Sanctions, ALJ Barnes stated:

> "Because Complainants failed to produce any information and documents responsive to PPL to Complainant Set I, No. 4 during the course of this proceeding, and they indicated that they did not intend to do so, I found that Complainants have not and will not experience any medical conditions or issues from the installation of PPL Electric's AMI meter as a sanction. Therefore, Complainants' health allegations will not be addressed in the body of this decision."

As previously indicated under (1)A, Interlocutory Order Granting Sanctions, supra, ALJ Barnes erred in accepting PPL Electric's logically incoherent and unsound reasoning concerning the production of Complainants' medical records as grounds for imposing sanctions upon the Complainants. Further, the sanctions imposed by ALJ Barnes severely prejudiced the Complainants' case, precluded the Complainants from presenting highly relevant, highly credible and reliable evidence of definite probative value, and thereby deprived them of their due process rights to fully and properly challenge, pursuant to 66 Pa. C.S. § 1501, the safety and reasonableness of PPL Electric's AMI smart meters.

On page 11 of the ALJ's Initial Decision, ALJ Barnes states: "The instant case is more similar than distinguishable from prior decisions wherein the Commission has dismissed similar complaints." On the contrary, the Complainants argue that there is much to distinguish the instant case from the other smart meter cases alluded to by ALJ Barnes.

Both ALJ Barnes and PPL Electric Utilities have taken the position that the decidability of the issue of whether or not the Company's smart meters are in proper accordance with 66 Pa. C.S. § 1501 with regard to reasonableness and safety is predicated upon their contention that scientific safety studies are at present "inconclusive."

The Complainants have shown copiously and conclusively by having brought forth **public documents**, findings of multiple peer-reviewed scientific studies, and even a definitive medical handbook on the biological effects of electromagnetic fields, all demonstrating that:

> (1) It is incontrovertibly the case that the FCC safety guidelines for RF exposure do NOT account for all possible mechanisms of interaction of RF with biological structures and systems, and
>
> (2) The science is settled **beyond reasonable doubt** that such interactions in fact can and do occur which do NOT involve thermal mechanisms or acute exposure to RF.

By continuing the pattern followed in other smart meter cases, of misplacing the burden upon the Complainants such that they are required to conclusively prove harm by producing a preponderance of evidence that wireless smart meters are unsafe, the ALJ has failed to consider the FACT that at present, **there absolutely DOES NOT EXIST an established guideline or standard of safety** that would protect against any of the non-thermal mechanisms of interaction for RF **that are known to exist**. (See **Attachment III**.) This fact, among others, directly speaks, pursuant to 66 Pa. C.S. § 1501, to the utter unreasonableness of forcing the Complainants to endure chronic, long-term exposure to the RF radiation and fields produced by PPL Electric's AMI meters as a condition of their continuing to receive electric service.

The Initial Decision by the ALJ focused almost entirely on the standard dogmas concerning smart meter safety with regard to RF exposure and gave only the most perfunctory of considerations to the Complainants' allegations concerning fire safety and privacy.

In her Initial Decision, ALJ Barnes also completely failed to consider two (2) of the four main causes of action brought forth in depth in the Complainants' **Amended Complaint**, namely those having to do almost entirely with matters of law regarding PPL Electric's actions pursuant to the Commission's policy which:

> (1) mandated universal installation of smart meters based upon the Commission's misconstruction of the General Assembly's legislative intent as expressed in the language of Act 129—specifically codified under 66 Pa.C.S. § 2807(f)(1), § 2807(f)(2), **and** § 2807(f)(7), and
>
> (2) by mandating universal installation of smart meters, would **force** the Complainants' properties to be **used** by PPL Electric for purposes **other than** the collection of the Complainants' electricity usage data. That is, the Commission's policy would allow PPL Electric Utilities to forcibly use its AMI wireless smart meters on the Complainants' homes as "relay points to transmit data" **that does not originate from the Complainants' properties**.

The latter assertions expressed by allegation (2), immediately supra, involve far more than an ordinary property dispute between PPL Electric Utilities and the Complainants. Here, by enforcing its policy of universally mandating smart meters, the Pennsylvania Public Utility Commission, most definitely a state actor, **has insinuated itself directly into**, and **has become participatory in**, the violation of the Complainants' property rights protected under the Fourth, Fifth, Ninth and Fourteenth Amendments to the Constitution of the United States.

II. LEGAL STANDARDS

A. THE CONSTITUTION OF THE UNITED STATES, THE FOURTH, FIFTH, EIGHTH, NINTH, AND FOURTEENTH AMENDMENTS TO THE CONSTITUTION OF THE UNITED STATES

Article VI, Clause 3 of the United States Constitution states:

> *This Constitution, and the Laws of the United States which shall be made in Pursuance thereof; and all Treaties made, or which shall be made, under the Authority of the United States, shall be the supreme Law of the Land; and the Judges in every State shall be bound thereby, any Thing in the Constitution or Laws of any State to the Contrary notwithstanding.*

The Supremacy Clause of Article VI of the U.S. Constitution mandates that states must provide hospitable forums for federal claims and the vindication of federal rights (*Felder v. Casey,* 487 U.S. 131, 108 S. Ct. 2302, 101 L. Ed. 2d 123 (1988)).

The Supremacy Clause establishes that the federal constitution, and federal law generally, take precedence over state laws, and even state constitutions.

In Edgar v. MITE Corp., 457 U.S. 624 (1982), the Supreme Court ruled: "**A state statute is void to the extent that it actually conflicts with a valid Federal statute**".

The Fourth Amendment to the United States Constitution guarantees that:

> "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated ... ."

The Fifth Amendment provides that:

> "No person shall ... be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation."

The Eighth Amendment provides that:

> Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

The Ninth Amendment to the Constitution of the United States provides that:

> "The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people."

The Fourteenth Amendment provides in part:

> "No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."

B. **50 U.S.C. 36, Subchapter I, §§ 1801(f), 1809(a), 1810, and 1812**

> **Section 1801. "ELECTRONIC SURVEILLANCE" Definition**—
> ...
> (3) the intentional acquisition by an electronic, mechanical, or other surveillance device of the contents of any radio communication, under circumstances in which a person has a reasonable expectation of privacy and a warrant would be required for law enforcement purposes, and if both the sender and all intended recipients are located within the United States;
>
> (4) the installation or use of an electronic, mechanical, or other surveillance device in the United States for monitoring to acquire information, other than from a wire or radio communication, under circumstances in which a person has a reasonable expectation of privacy and a warrant would be required for law enforcement purposes.

Section 1809. Criminal Sanctions

(a) Prohibited activities A person is guilty of an offense if he intentionally—

(1) engages in electronic surveillance under color of law except as authorized by this chapter, chapter 119, 121, or 206 of title 18, or any express statutory authorization that is an additional exclusive means for conducting electronic surveillance under section 1812 of this title;

(2) discloses or uses information obtained under color of law by electronic surveillance, knowing or having reason to know that the information was obtained through electronic surveillance not authorized by this chapter, chapter 119, 121, or 206 of title 18, or any express statutory authorization that is an additional exclusive means for conducting electronic surveillance under section 1812 of this title.

Section 1810. Civil Liability

An aggrieved person, other than a foreign power or an agent of a foreign power, as defined in section 1801(a) or (b)(1)(A) of this title, respectively, who has been subjected to an electronic surveillance or about whom information obtained by electronic surveillance of such person has been disclosed or used in violation of section 1809 of this title shall have a cause of action against any person who committed such violation and shall be entitled to recover—

(a) actual damages, but not less than liquidated damages of $1,000 or $100 per day for each day of violation, whichever is greater;

(b) punitive damages; and

(c) reasonable attorney's fees and other investigation and litigation costs reasonably incurred.

Section 1812. Statement of exclusive means by which electronic surveillance and interception of certain communications may be conducted

(a) Except as provided in subsection (b), the procedures of chapters 119, 121, and 206 of title 18 and this chapter shall be the exclusive means by which electronic surveillance and the interception of domestic wire, oral, or electronic communications may be conducted.

(b) Only an express statutory authorization for electronic surveillance or the interception of domestic wire, oral, or electronic communications, other than as an amendment to this chapter or chapters 119, 121, or 206 of title 18 shall constitute an additional exclusive means for the purpose of subsection (a).

C. EVIDENTIARY STANDARDS AND CRITERIA

Evidence is relevant if it tends to establish facts in issue. *LeRoi v. Pa. State Civil Service Commission,* 382 A.2d 1260 (Pa. Cmwlth. 1978).

"Commonwealth agencies shall not be bound by technical rules of evidence at agency hearings, and **all relevant evidence of reasonably probative value may be received**." 2 Pa. C.S. § 505.

The Pennsylvania Public Utility Commission, a Commonwealth agency, is not bound by technical rules of evidence at agency hearings and therefore may receive all relevant evidence of reasonably probative value.
If the evidence is relevant to the issues before the agency and of reasonable probative value, the agency may receive it. 2 Pa. C.S. § 505.

Hearsay evidence may generally be received and considered during an administrative proceeding. *See A.Y. v. Commonwealth, Dep't of Pub. Welfare, Allegheny County Children & Youth Serv.,* 537 Pa. 116, 641 A.2d 1148, 1150 (1994).

Under the relaxed evidentiary standards applicable to administrative proceedings, as provided under 2 Pa. C.S. § 505, it is well-settled that simple hearsay evidence, which otherwise would be inadmissible at a trial, **generally may be received into evidence and considered during an administrative proceeding.** *D'Alessandro v. Pennsylvania State Police*, 937 A.2d 404, 411, 594 Pa. 500, 512 (2007).

Substantial evidence is such relevant evidence as a reasonable mind might accept as adequate to support a conclusion. *Borough of E. McKeesport v. Special/Temporary Civil Serv. Comm'n*, 942 A.2d 274, 281 n.9 (Pa. Cmwlth. 2008)

Substantial evidence must be "more than a scintilla and must do more than create a suspicion of the existence of the fact to be established." *Kyu Son Yi v. State Bd. of Veterinary Med.*, 960 A.2d 864, 874 (Pa. Cmwlth. 2008).
In order for evidence relied upon in an administrative proceeding to be considered "substantial evidence," the ". . . information admitted into evidence must have sufficient indicia of reliability . . . " *Gibson v. W.C.A.B,* 861 A.2d 938, 944, 580 Pa. 470, 480 (Pa. 2004).

To satisfy the requirement of authenticating or identifying an item of evidence ... "the proponent must produce evidence sufficient to support a finding that the item is what the proponent claims it is." Pa. R.E., Rule 901.

Evidence which is corroborated by any competent evidence in the record must be given its "natural probative" effect.

The Complainants have brought forth a voluminous amount of highly relevant, highly credible and reliable evidence of definite probative value that certainly meets the above criteria and which would constitute a preponderance of evidence, acceptable to any reasonable mind, that forced, chronic, long-term exposure, even at very low levels, to the radiofrequency radiation and RF fields produced by PPL Electric's AMI wireless smart meters poses a substantive risk to health and safety.

Although the Complainants admittedly are not experts in the fields of medicine or radiation biophysics, they are sufficiently educated and have expertise enough to understand the public documents and the conclusions published in peer-reviewed scientific studies that are written in plain English such that any reasonably well-educated school student could understand.

However, despite the evidentiary standards and criteria listed supra, in the course of the proceedings of the instant case, ALJ Barnes utterly failed to apply careful judicial scrutiny to the Complainants' evidentiary exhibits in light of those standards and criteria and despite the fact that much of the evidence was published in **public documents**. Nonetheless, virtually all of the Complainants' evidentiary exhibits concerning RF safety were denied admission into the record.

III. EXCEPTIONS

EXCEPTION NO. 1: The ALJ erred in failing to consider the FACT that the Commission's policy mandating universal installation of smart meters, would force the Complainants' properties to be used by PPL Electric for purposes other than the collection of the Complainants' electricity usage data. That is, the Commission's policy would allow PPL Electric Utilities to forcibly use its AMI wireless smart meters on the Complainants' homes as "relay points to transmit data" that does not originate from the Complainants' properties.

On page 1 of 'PPL Electric AMI Customer Privacy Policy', PPL Electric Exhibit KD-4 in the instant case, it states:

> **"This AMI Data is collected via (and transported on) the AMI network, which is the data communinications path from the meter to the head-end application."**

On page 6 of 'Direct Testimony of Mike Asbury', PPL Electric Statement No. 4 (dated February 28, 2020) in the instant case, Mr. Asbury testified that:

> **"The individual RF mesh meters are used as relay points to transmit data back to PPL Electric utilizing a 900 megahertz ('MHz') frequency."**

In other words, PPL Electric is using customers' homes and properties for purposes other than the collection of the customers' electricity usage data. That is, the Commission's policy would permit PPL Electric Utilities to forcibly use its AMI wireless smart meters on the customers' homes as "relay points to transmit data" that does not originate from the customers' properties.

PPL ELECTRIC'S VIOLATION OF PROPERTY RIGHTS PURSUANT TO THE COMMISSION'S POLICY-MANDATED INSTALLATION OF SMART METER DEVICES

ASSERTIONS of FACT and MATTERS of LAW:

1. Private property rights are a fundamental and preeminent part of citizens' rights protected under the state and federal constitutions.

2. Neither 52 Pa.C.S. §56.81(3), nor 66 Pa.C.S. § 1406(a)(4), nor does Act 129 or any other statute, regulation or policy relevant to the matter brought forth in this Complaint preempt, supervene, supersede or take precedence over citizens' private property rights.

3. There is no law, statute, official rule, regulation, or right of easement which permits, or would permit, PPL Electric Utilities to install any device other than a meter, only a meter, and nothing but a meter on the Complainants' homes or properties without their consent.

4. In their original intent and as written, 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) apply to **meters**, **only to meters**, and **to nothing but meters**.

5. In the instant case, 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) apply to meters, only to meters, and to nothing but meters—devices with the functional capability of doing nothing more or other than to measure electric power usage such that electric utility companies are able to bill according to the actual amount of electricity used.

6. Given the capability specified in ¶ 5, supra, no other functionality of an electric power meter is necessary in order for an electric utility company to receive full and proper remuneration for its services.

7. Given the capability specified in ¶ 5, supra, no other functionality of an electric power meter is necessary in order for PPL Electric Utilities to enjoy fully the original single purpose for which it was granted an easement.

8. 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) do ***not*** apply to commercial-use, radiofrequency broadcasting antennas and transmitters.

9. 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) do ***not*** apply to data communications devices used as "relay points to transmit data" that does not originate from the customers' homes or properties.

10. 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) do ***not*** apply to computers.

11. 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) do ***not*** apply to devices such as 'switched mode power supplies' (SMPS) which produce high-frequency voltage transients of conducted emissions and/or which introduce, add to, or propagate such emissions through the electrical wiring of homes and buildings.

12. 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) do ***not*** apply to devices which produce and/or augment emanation of electromagnetic fields (EMFs) from the electrical wiring of homes and buildings.

13. There is no law, statute, official rule, regulation, or right of easement which permits, or would permit, PPL Electric Utilities to install powerful, FCC-regulated, RF-radiating, radio- transmission antennas on the Complainants' homes or properties without their consent.

14. There is no law, statute, official rule, regulation, or right of easement which permits, or would permit, PPL Electric Utilities to install FCC-regulated computer and data communications devices on the Complainants' homes or properties without their consent.

15. PPL Electric Utilities has never been authorized or given permission or the right, either by easement or by siting license or permit, to install or operate powerful, FCC-regulated, RF radiation-emitting, radio-transmission and data communications devices on the Complainants' homes or properties.

16. "A 'seizure' of property occurs when there is some meaningful interference with an individual's possessory interests in that property." ... "See United States v. Place, 462 U.S. 696 (1983); id., at 716 (BRENNAN, J., concurring in result); Texas v. Brown, 460 U.S. 730, 747 -748 (1983) (STEVENS, J., concurring in judgment); see also United States v. Chadwick, 433 U.S. 1, 13 -14, n. 8 (1977); Hale v. Henkel, 201 U.S. 43, 76 (1906). ... [T]his definition follows from our oft-repeated definition of the 'seizure' of a person within the meaning of the Fourth Amendment - meaningful interference, however brief " (*United States v. Jacobsen* 466 U.S. 109, 113.)

In *Lugar v. Edmondson Oil*, 457 U.S. 922, 942 (1982), the Court stated:

> "[W]e have consistently held that a private party's joint participation with state officials in the seizure of disputed property is sufficient to characterize that party as a 'state actor' for purposes of the Fourteenth Amendment. The rule in these cases is the same as that articulated in *Adickes v. S. H. Kress & Co.*, supra, at 152, in the context of an equal protection deprivation:
>
> > "'Private persons, jointly engaged with state officials in the prohibited action, are acting "under color" of law for purposes of the statute. To act "under color" of law does not require that the accused be an officer of the State. It is enough that he is a willful participant in joint activity with the State or its agents,'" quoting *United States v. Price*, 383 U.S., at 794." (See '**State Action Doctrine**' **(Attachment I)** at the end of this document.)

The operation of an FCC-regulated, RF radiation-emitting, radio-transmission device that is owned by a party other than the owner of the home to which the device is attached is, ipso facto, a ***use*** by the operating party in the property of the homeowner. The operation of an FCC-regulated, data communications/data relay device that is owned by a party other than the owner of the home to which the device is attached is, ipso facto, ***a use*** by the operating party in the property of the homeowner.

17. There is no law, statute, official rule, regulation, or right of easement which permits, or would permit, PPL Electric Utilities to use the Complainants' homes as sites for the company's AMI smart meters to function partly as "relay points to transmit data" that does not originate from the Complainants' homes or properties.

18. **The Commission's policy of mandating the installation of smart meters would force the Complainants' properties to be used by PPL Electric Utilities for purposes other than the collection of the Complainants' electricity usage data. That is, the Commission's policy would allow the electric utility to forcibly use its AMI wireless smart meters on the Complainants' homes as "relay points to transmit data" that does not originate from the Complainants' properties.** PPL Electric Utilities, **acting with the imprimatur either of the Commission or of the State itself**, thus would be given usage of the Complainants' properties without such usage having been granted either by the existing easement or by the Complainants' informed consent. The Commission's policy pursuant to Act 129 therefore violates the Complainants' property rights protected under the Fifth, Ninth and Fourteenth Amendments to the Constitution of the United States.

19. PPL Electric Utilities does **not** have the statutory authority or right to site powerful, radiofrequency radiation-producing, RF-transmitting, data communications devices on the Complainants' properties and to thereby **physically affect or cause physical alteration** to the ***interior*** environments of the Complainants' homes by means of the production of RF electromagnetic fields, and/or conducted emissions ('high-frequency voltage transients') and/or frequent transmissions of modulated radiofrequency radiation which would add to the already-existing RF radiation burden from other outside sources including area cell phone towers, other smart meters and facilities in the utility company's AMI mesh network, etc.

20. Without customer consent, PPL Electric Utilities does ***not*** have the statutory authority or right, pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), to **use** customers' homes in such a way as to irradiate them in perpetuity ***from their own premises*** with what has been found conclusively, on the basis of strong and clear scientific evidence, to **at least** ***a Group 2B possible human carcinogen***.

21. Without customer consent, PPL Electric Utilities does ***not*** have the statutory authority or right, pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), to **use** customers' homes, and **by and through such direct use of customers' own premises**, physically alter customers' living environments in any way which possibly could **increase** customers' **risk** of sustaining biological or adverse health effects.

22. Without customer consent, PPL Electric Utilities does ***not*** have the statutory authority or right, pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), to **use** customers' homes and from the customers' own premises, irradiate them in perpetuity ***as a condition of their continuing to have access to electric service***.

23. Without customer consent, PPL Electric Utilities, acting pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), has no statutory authority or right, by company use of customers' homes or properties, to increase customers' risk—***no matter how small***—of biological or adverse health effects as a condition of their having access to electric service.

24. Without customer consent, the Pennsylvania Public Utility Commission, acting pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), has no statutory authority or right, through state-regulated electricity providers' use of customers' homes or properties, to increase customers' risk— no matter how small—of biological or adverse health effects as a condition of customers having access to electric service.

25. Without customer consent, the State of Pennsylvania, acting pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), has no statutory authority or right, through state-regulated electricity providers' use of customers' homes or properties, to increase customers' risk—no matter how small—of biological or adverse health effects as a condition of their having access to electric service.

26. The Pennsylvania Public Utility Commission has jurisdiction over the state's public electric utilities.

27. The Pennsylvania Public Utility Commission does not have statutory authority or jurisdiction over the public's inherent right to deny consent.

28. The PA PUC has authority to mandate that the state's electric utility companies ***offer*** AMI wireless smart meters for use by the public, but the Commission cannot, especially given the absence of explicit, clear and definitive direction set forth by the Pennsylvania Legislature, mandate or require that the utilities install smart meters on the private properties of persons who do not want or do not consent to them.

29. Act 129 does not compel citizens or the public to submit or give consent to the installation of AMI wireless smart meter devices on their homes or properties.

30. Act 129 does not confer authority upon the electric utility companies to compel persons to submit or give consent to the installation of AMI wireless smart meter devices on their homes or properties.

31. Act 129 does not compel the state's electric utility companies to act so as to compel persons to submit or give consent to the installation of AMI wireless smart meter devices on their homes or properties.

32. Act 129 does not compel the state's electric utility companies to terminate electric service to customers who do not give consent to the installation of AMI wireless smart meter devices on their homes or properties.

33. 52 Pa.C.S. §56.81(3), and/or 66 Pa.C.S. § 1406(a)(4), separately or in combination, do ***not*** compel any state-regulated electric utility company to terminate customers' electric service. These regulations simply authorize such companies to do so in accordance with certain provisions.

34. 52 Pa.C.S. §56.81(3), and/or 66 Pa.C.S. § 1406(a)(4), separately or in combination, do ***not*** compel citizens or the public to submit or give consent to the installation of AMI wireless smart meter devices on their homes or properties.

35. 52 Pa.C.S. §56.81(3), and/or 66 Pa.C.S. § 1406(a)(4), and/or Act 129, separately or in combination, do ***not*** confer statutory authority upon the Pennsylvania Public Utility Commission or any state-regulated electric utility company to compel persons to submit or give consent to the installation of AMI wireless smart meter devices on their homes or properties.

36. 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4) and/or Act 129, separately or in combination, do ***not*** compel any state-regulated electric utility company to act so as to compel persons to submit or give consent to the installation of AMI wireless smart meter devices on their homes or properties.

37. 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4) and/or Act 129, separately or in combination, do ***not*** compel any state-regulated electric utility company to terminate electric service to customers who do not give consent to the installation of AMI wireless smart meter devices on their homes or properties.

38. Neither the Pennsylvania Public Utility Commission nor the state's electric utility companies have, on the basis of a complete, objective, unbiased, non-selective accounting of the available scientific evidence, ever properly established the safety specifically of AMI wireless smart meter devices and technology with regard to their production of modulated radiofrequency radiation, RF electromagnetic fields, and conducted emissions of high-frequency voltage transients.

39. The Pennsylvania Public Utility Commission has never required or obtained, in accordance with **66 Pa.C.S. §315 (c),** definitive proof, by means of the production of independent, unbiased, entirely non-selective and conclusive scientific evidence, that the modulated RF radiation, RF electromagnetic fields and/or conducted emissions produced specifically by the operation of AMI wireless smart meters and smart meter network technologies do not, could not, cannot and will not cause biological or adverse health effects.

40. "Utility service is a necessity of modern life; indeed, the discontinuance of water or heating for even short periods of time may threaten health and safety." (*Memphis Light, Gas & Water Div. v. Craft*, 436 U.S. 1.)

"Electrical service, being a necessity of life ..., is an entitlement which under our decisions may not be taken without the requirements of procedural due process. Fuentes v. Shevin, 407 U.S. 67, 80 (1972); Goldberg v. Kelly, 397 U.S. 254 (1970); Palmer v. Columbia Gas of Ohio, Inc., 479 F.2d 153 (CA6 1973)."

41. Under 52 Pa.C.S. § 56.81(3) and 66 Pa.C.S. § 1406(a)(4), a termination of service is authorized for a customer's "[f]ailure to permit access to meters, service connections or other property of the public utility for the purpose of replacement, maintenance, repair or meter reading."

42. PPL Electric Utilities, pursuant to the Commission's policy-mandated, smart meter implementation orders, has threatened to terminate Complainants' access to electricity, sending a notice-of-termination letter with the "Reason for Termination" given as "Non-Access to Meter."

43. The Complainants have ***never*** denied PPL Electric Utilities access to the company's meter for any purpose **that is properly *proven* to be *safe*** and which would not be in violation of the Complainants' fundamental rights. This includes access for the purpose of replacement of the meter. The Complainants' simply have denied the company permission to install a device which is far more than merely a meter and for which **there is no reliable medical or scientific evidence upon which to conclude that chronic, long-term exposure to the radiofrequency radiation and RF fields produced as a result of the installation of such metering devices could not, cannot, would not and will not cause, exacerbate or contribute to biological or adverse health effects.**

44. It is not constitutionally permissible for PPL Electric Utilities to terminate or withhold electric service or to in any way penalize the Complainants solely on the basis of the Complainants not giving consent to the company's installation of AMI wireless smart meter devices on the Complainants' homes or properties.

ARGUMENTS:

An electric meter is simply a device which *measures* electric power usage such that electric utilities are able to bill according to the actual amount of electricity used—nothing more. No other functionality is necessary for the meter to accomplish this sole purpose. No other functionality is necessary in order for an electric utility company to receive full and proper remuneration for its services so as to enjoy fully the original single purpose for which it was granted an easement.

In their original intent and as written, 52 Pa.C.S. §56.81(3) and 66 Pa.C.S. § 1406(a)(4) apply to meters, only to meters, and to nothing but meters having the functionality just described. The provisions specified in these regulations do ***not*** apply to computers, and they do ***not*** apply to commercial-use radiofrequency broadcasting antennas and transmitters, and they do ***not*** apply to devices which demonstrably produce high-frequency voltage transients of RF conducted emissions and which in fact propagate such emissions into and through the electrical wiring of homes and buildings.

Pursuant to the Commission's policy-mandated smart meter implementation orders, the Complainants' electric service provider, nevertheless, is not seeking to replace the Complainants' present analog meter with simply another meter which likewise would be dedicated solely to the measurement of electricity usage. The company is seeking instead to install *additional* equipment consisting of an assemblage of other devices—euphemistically called a 'smart meter'—in the guise of a 'meter'. This composite collection of additional devices includes a computer and powerful, modulated radiofrequency radiation-producing devices—that is, dual-antenna radio receivers and transmitters. By invoking 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4) in threatening to terminate Complainants' access to electric service, the Complainants' electric service provider, with the imperative, impetus and complicity of the PA PUC, is thus seeking to completely alter and misapply the very definition and original meaning of the term '***meter***'.

Under such a broad definition of the term 'meter', a utility could include any assortment of equipment or set of devices as long as such could be integrated, consolidated or compacted into a unitary assemblage the size of a standard analog electric meter and which could be plugged into a standard meter socket.

The operation of a powerful, FCC-regulated, RF radio-transmission device owned by a party other than the owner of the home to which the device is attached constitutes, and is, a **use** by the operating party in the property of the homeowner. PPL Electric Utilities has never been given permission, authority or the right, by means of easement, license, permit, or any other contractual legal instrument or agreement, to install or operate such equipment on the Complainants' homes or properties. Moreover, neither Act 129, nor 52 Pa.C.S. §56.81(3), nor 66 Pa.C.S. § 1406(a)(4), separately or in combination, confer upon the electric utility the statutory authority or right to install or operate this equipment on the Complainants' homes or properties *without their consent*. The utility therefore is not entitled to such use of the Complainants' homes or properties without their consent.

Furthermore, in consequence of the fact that AMI wireless smart meter devices produce RF conducted emissions of high-frequency voltage transients *and* frequent, pulsed transmissions of modulated radiofrequency radiation—both of which could increase the risk of biological and/or adverse health effects even at low levels—the technology which utilizes these devices comes highly safety-impugned and therefore cannot be conclusively relied upon as a 'safe' and 'reasonable' use.

Over the Complainants' objections, PPL Electric Utilities, pursuant to the company's acting under color of law as an agent of the State, has acted in complete disregard of the original terms and intent of the existing easement, as if the company were lawfully empowered to unilaterally change these terms so as to use the Complainants' private homes and properties in the service of the company's own commercial interests, that is, to use the Complainants' homes as sites for the company's AMI smart meters to function within its mesh network partly as "relay points to transmit data" that does not originate from the Complainants' homes or properties.

The Fourteenth Amendment to the U.S. Constitution prohibits the State from enforcing Act 129 insofar as Act 129 would be used to restrict or deprive Complainants of their fundamental liberties and rights to protect themselves and their property. Even if Act 129 were a law which had been enacted to further a compelling governmental interest, it would have to have been narrowly constructed or tailored, employing the ***least restrictive*** measures possible to achieve that interest.

In accordance with the *Overbreadth Doctrine*, a statute or statutory provision which regulates actions or activities that are not constitutionally protected must not be written or applied so broadly as to restrict or adversely impact actions, activities, rights, privileges or immunities that *are* constitutionally protected.

The Complainants' being forced to endure chronic, long-term exposure to biologically interactive, modulated radiofrequency radiation and RF electromagnetic fields, produced by the wireless devices and facilities which PPL Electric Utilities would use on their homes, potentially could adversely impact their health and safety. Act 129, insofar as it is being construed by the Pennsylvania Public Utility Commission as a means of enforcement in compelling Complainants to give consent to PPL Electric Utilities to so use Complainants' homes as a condition of their having access to electric service, is therefore *overbroad* and manifestly unconstitutional in its application.

No law in this nation was ever written or intended to be used to justify or permit the forcible subjection of citizens to potentially increased risk of harm as a condition of having access to a vital necessity—in this case, electricity.

"Certainly, an act passed by a state legislature that directs a discriminatory result is state action and would violate the first section of the Fourteenth Amendment." *United States v. Raines*, 362 U.S. 17, 25 (1960).

"Pennsylvania Act 129, passed into law in 2008, **requires electric utilities with more than 100,000 customers to provide those customers with advanced meters** that have specific capabilities."

Because Act 129 exempts electric distribution companies with fewer than 100,000 customers from the requirements of implementing AMI smart meter technology, the customers of these companies are protected from having to suffer abridgement and violation of their constitutionally-secured rights by the enforcement of such policy as has been mandated on the basis of the PA PUC's misconstruction of the law. Enforcement of Act 129, as accomplished under the Commission's policy by making smart meters mandatory and not optional, contrary to the explicitly-expressed intent of the Pennsylvania General Assembly, and by applying this mandate to affect only select customers, denies those select citizens, including the Complainants, the ***equal protection of the laws*** as guaranteed under the Fourteenth Amendment to the Constitution of the United States.

If, pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), separately or in combination, the Pennsylvania Public Utility Commission permits PPL Electric Utilities—by means of the provider's threatening to terminate Complainants' access to electric service—to **coerce** the Complainants' consent to the use of their homes and property for the installation and operation of AMI wireless smart meter devices, such action, usurpation and use shall be in direct violation of the Complainants' due process and property rights established under easement and under the Pennsylvania Constitution and the Fifth, Eighth, and Fourteenth Amendments to the Constitution of the United States.

SUMMARY and CONCLUSION:

The State is **prohibited** by the Fourteenth Amendment to the Constitution of the United States not only from making any law which shall violate or deprive Complainants' of their fundamental rights, it also is **precluded from enforcing** such a law—Act 129, in the instant case.

The Pennsylvania Public Utility Commission and PPL Electric Utilities, when acting in their capacities as agents of the State, are bound by the laws and statutes of the Commonwealth of Pennsylvania and by the laws, statutes and Constitution of the United States, and as such, the Commission and PPL Electric Utilities are prohibited from abridging or violating the rights, including property rights, of citizens of the United States.

There is no state or federal statute, law, regulation or rule that would permit PPL Electric Utilities, when acting in a capacity **as an agent of the State**, to act in a way that would encroach upon the Complainants' rights protected under the laws, statutes and Constitution of the United States.

Without the Complainants' consent and without due process of law, neither PPL Electric Utilities, nor the Pennsylvania Public Utility Commission, nor the Commonwealth of Pennsylvania has the statutory authority or right to seize, take, require, or make use of the Complainants' homes or properties for any purpose or in any manner or with any equipment, devices or facilities of any kind which have never been studied specifically for possible biological or adverse health effects and which never have been granted by easement, siting permit or license.

Because, in direct violation of the Complainants' rights protected under the Fourth, Fifth, Ninth and Fourteenth Amendments to the Constitution of the United States, enforcement by the Commission of its policy mandating smart meters pursuant to Act 129 ultimately requires, as a condition of the Complainants' having access to electric service, that PPL Electric Utilities in effect seize, take and/or make use of the Complainants' properties in a manner and with kinds of devices and facilities that not only never have been granted by easement, siting permit, license, or the Complainants' consent, but also never have been studied specifically for possible biological or adverse health effects, it is, in accordance with the Pennsylvania Constitution and the laws, statutes and Constitution of the United States, lawfully binding and incumbent upon the Commission to grant relief to the Complainants.

EXCEPTION NO. 2: 'Conclusions of law' asserted on page 17 of the ALJ's Initial Decision concerning Act 129 and the Commission's no-opt-out policy mandating universal installation of smart meters are fundamentally flawed and directly conflict with not only the Commonwealth Court's decision in *Povacz, et al. v. Pennsylvania Public Utility Commission*, but also the prevailing legislative intent of the Pennsylvania General Assembly as explicitly and publically expressed in the *Legislative Journal of the Pennsylvania Senate,* dated October 8, 2008, by at least three (3) Pennsylvania senators who directly participated in amending HB 2200 to its final form in Act 129.

THE COMMISSION'S MISCONSTRUCTION of the PREVAILING LEGISLATIVE INTENT of the PENNSYLVANIA GENERAL ASSEMBLY

MATTERS OF LAW and ASSERTIONS of FACT DERIVING DIRECTLY FROM THE LAW AS WRITTEN:

1. The exact language pertinent to this matter under **66 Pa.C.S. § 2807(f)(2) and § 2807(f)(7)** and enacted into law pursuant to **Act 129** is as follows (underlining, emphasis and italics added):

> **(2) Electric distribution companies shall furnish smart meter technology as follows:**
>
> **(i) Upon request from a customer that agrees to pay the cost of the smart meter at the time of the request.**
>
> **(ii) In new building construction.**
>
> **(iii) In accordance with a depreciation schedule not to exceed 15 years.**
>
> **...**

> **(7)** An electric distribution company may recover reasonable and prudent costs of ***providing*** smart meter technology **under paragraph (2)(ii) and (iii)**, as determined by the commission. This paragraph includes annual **depreciation** and capital costs **over the life of the smart meter technology** and the cost of any system upgrades that the electric distribution company may require to enable the use of the smart meter technology which are incurred after the effective date of this paragraph, less operating and capital cost savings realized by the electric distribution company from the installation and use of the smart meter technology. ...

2. In the Pennsylvania Public Utility Commission Hearing, dated January 24, 2013 and pertaining to *Maria Povacz v. PECO Energy Company* (PA PUC Docket No. C-2012-2317176), the following several statements were put forth as rationale and justification of the Commission's 'no opt-out' policy:

> "The ALJ stated that the use of the word 'shall' in the statute indicates the General Assembly's direction that all customers will receive a smart meter. Furthermore, noted the ALJ, there is no provision in the statute that allows customers to 'opt out' of smart meter installation ... ." (p. 6.)
>
> "The ALJ continued that neither the Commission's Orders implementing this provision of Act 129, nor PECO's specific implementation plan, allow customers to 'opt out' of smart meter installation." (p. 7.)
>
> "PECO relies, in part, on the following language from the Commission's *Smart Meter Implementation Order*, *supra*, to support its argument that the Complainant cannot opt out of the smart meter installation:
>
> > The Commission believes that it was the intent of the General Assembly to require all covered [Electric Distribution Companies] to deploy smart meters system-wide **when it included a requirement for smart meter deployment 'in accordance with a depreciation schedule not to exceed 15 years.'** 'the Commission's Order does not have a provision for customers to "opt out" of the smart meter installation.'" (p. 7.) (Underlining and emphasis added.)
>
> "Additionally, as noted by the ALJ, Section 2807(f)(2) of the Code, *supra*, is controlling here, and the use of the word 'shall' in the statute indicates the General Assembly's direction that all customers will receive a smart meter." (p. 10.)

3. The law, as stated, directs electric utility companies (EDCs) simply to furnish—that is, to offer, provide, or make available—smart meter technology under the conditions specified by Provisions (i), (ii) and (iii) of § 2807(f)(2) **and** by **§ 2807(f)(7)**, supra.

4. Provision (i) of § 2807(f)(2) requires EDCs to furnish—to offer, provide, or make available—smart meter technology to customers who request such and who agree to pay the cost of the smart meters at the time of their requests.

5. Provision (iii) of § 2807(f)(2) requires EDCs to furnish—to offer, provide, or make available—smart meter technology in accordance with a maximum 15-year schedule of depreciation as set forth under § 2807(f)(7).

6. Act 129 contains no explicit language which states that EDCs must install AMI smart meters on homes or properties of customers who do not want or do not consent to them.

7. Act 129 contains no non-vague language which clearly and unambiguously implies or would imply that EDCs must install AMI smart meters on homes or properties of customers who do not want or do not consent to them.

8. Act 129 contains no explicit language which states that smart meters are mandatory or that customers cannot opt out of having AMI smart meters installed.

9. Act 129 contains no non-vague language which clearly and unambiguously implies or would imply that customers cannot opt out of having AMI smart meters installed.

10. There is no provision in the statute, Act 129, that explicitly disallows customers from 'opting out' of smart meter installation.

11. There is no non-vague provision in the statute, Act 129, which clearly and unambiguously disallows or would disallow customers from 'opting out' of smart meter installation.

12. The absence of explicit *opt-out* language in Act 129 does not logically entail, and is not necessarily equivalent or tantamount to, an automatic, universal opt-in.

13. The language expressed by Provision (i) of § 2807(f)(2) is explicitly *opt-in* language, making the choice of having a smart meter installed optional on the part of the customer.

14. The interpretation of § 2807(f)(2) by the Pennsylvania Public Utility Commission is such that, explicitly on the one hand, customers can request a smart meter, that is, they can opt in or could have opted in, but implicitly on the other hand, they cannot opt out and could not have opted out.

15. Not only is this interpretation by the Commission inconsistent, it renders Provision (i) of § 2807(f)(2) as being virtually superfluous and practically moot, effectively preempting the legislative intent of the General Assembly as expressed in that provision. Even if customers had requested and agreed to pay for the installation of smart meters, they would not have been able to realize any advantage of doing so until their EDCs had implemented their Smart Meter Plans to make the requisite smart meter technology and system infrastructure available and fully functional.

16. As evidenced by the facts asserted in ¶ 2, supra, the Commission's 'no opt-out' policy pursuant to § 2807(f)(2) is predicated entirely upon the word "shall" and upon the Provision (iii) phrase: "in accordance with a depreciation schedule not to exceed 15 years."

17. The language of Provision (iii) of § 2807(f)(2) simply establishes a specified schedule, or limiting time frame.

18. Together, Provision (iii) of § 2807(f)(2) **and** Paragraph (7) of § 2807(f) specify clearly and unequivocally that **it is the new AMI smart meter facilities and equipment, which**, as the technology is implemented and made available to customers by their EDCs, **are permitted to be depreciated over a period not greater than 15 years.** (See ¶ 1, supra.**)**

19. The facts asserted in ¶¶ 17 and 18, supra, are confirmation that Provision (iii) of § 2807(f)(2) has everything to do with placing a time limit on depreciation o*f **new*** equipment, that is, of smart meter technology, as set forth under Paragraph (7) of § 2807(f), and nothing to do with establishing a mandate requiring system-wide implementation of AMI smart meter technolog*y with no customer opt-out*.

20. There is no non-vague language, explicit or implicit, clearly and unambiguously expressed in Provision (iii) alone, or in combination with any other part of § 2807(f)(2), which definitively would establish the Commission's 'no opt-out' interpretation of that paragraph under Act 129 as a mandate expressing the legislative intent of the General Assembly.

21. House Bill HB 2200 (Printer's No. 4429 version dated Sept. 23, 2008), contains the following language which was stricken as shown:

~~Section 4. Section 2807(e) of Title 66 is amended by adding a paragraph to read:~~

~~§ 2807. Duties of electric distribution companies.~~

...

~~(ii) Electric distribution companies shall furnish smart meter technology to:~~

~~(A) Customers responsible for 40% of the distribution company's annual peak demand within four years after the effective date of this paragraph.~~

~~(B) Customers responsible for 75% of the distribution company's annual peak demand within six years after the effective date of this paragraph.~~

~~(C) One hundred percent of its customers within ten years after the effective date of this paragraph.~~

In the same Printer's No. 4429 document, the above language was changed to:

SECTION 3. SECTION 2807(E) OF TITLE 66 IS AMENDED AND THE SECTION IS AMENDED BY ADDING SUBSECTIONS TO READ:
§ 2807. DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.

...

(2) ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS:

(I) UPON REQUEST TO A CUSTOMER THAT AGREES TO PAY THE COST OF THE SMART METER.

(II) IN THE CONSTRUCTION OF A NEW RESIDENCE OR NEW BUILDING TO BE USED BY A COMMERCIAL CUSTOMER.

(III) IN ACCORDANCE WITH A SCHEDULE OF REPLACEMENT OF FULL DEPRECIATION OF EXISTING METERS.

The language of § 2807 thus had been changed at this point ***from*** the stricken

"(ii) Electric distribution companies shall furnish smart meter technology to: ... (C) One hundred percent of its customers within ten years after the effective date of this paragraph"

to

"(2) ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS: ... (III) IN ACCORDANCE WITH A SCHEDULE OF REPLACEMENT OF FULL DEPRECIATION OF **EXISTING** METERS."

Immediately prior to the enactment HB 2200 into law as Act 129, Provision (III) in the language of the foregoing version was changed ***from***

"(III) IN ACCORDANCE WITH A SCHEDULE OF REPLACEMENT OF FULL DEPRECIATION OF **EXISTING** METERS."

to

"(III) IN ACCORDANCE WITH A DEPRECIATION SCHEDULE NOT TO EXCEED 15 YEARS"

as also stated in ¶ 22, *infra*.

The phraseology of the earlier provision, "shall furnish smart meter technology to ... One hundred percent of its customers within ten years," may well have implied a system-wide mandate. However, by amendment, ***this provision was stricken*** and replaced simply with a provision which at first allowed for depreciation of ***existing*** meters over an indefinite period. Then, with one final modification of the latter provision, a definite time limit of 15 years was instead set for depreciation of the ***new*** AMI smart meters and, in accordance with Paragraph (7) of § 2807(f), was applicable **specifically** to the new AMI smart meters. Provision (iii) of § 2807(f)(2) therefore most clearly has everything to do with allowing for depreciation of new AMI smart meter equipment and nothing to do with establishing a mandate requiring system-wide implementation of AMI smart meter technology with no customer opt-out.

22. House Bill HB 2200 (Printer's No. 4526 version dated Oct. 7, 2008) thus includes the following language as further changed from that appearing in the Printer's No. 4429 version:

SECTION 3. SECTION 2807(E) OF TITLE 66 IS **AMENDED** AND THE
SECTION IS AMENDED BY ADDING SUBSECTIONS TO READ:

§ 2807. DUTIES OF ELECTRIC DISTRIBUTION COMPANIES.

...

(2) ELECTRIC DISTRIBUTION COMPANIES SHALL FURNISH SMART METER TECHNOLOGY AS FOLLOWS:

(I) UPON REQUEST FROM A CUSTOMER THAT AGREES TO PAY THE COST OF THE SMART METER AT THE TIME OF THE REQUEST.

(II) IN NEW BUILDING CONSTRUCTION.

(III) IN ACCORDANCE WITH A DEPRECIATION SCHEDULE NOT TO EXCEED 15 YEARS.

This is the language of the *final version* of § 2807 of HB 2200 *as amended by the Pennsylvania Senate*. It is this version of § 2807 which is expressed in the exact language as that under § 2807(f)(2) of Title 66 of the Public Utility Code and which was enacted into law under Act 129.

23. In the ***Legislative Journal of the Pennsylvania Senate,*** dated October 8, 2008, at least three (3) Pennsylvania senators representing both major political parties are on public record as having stated ***explicitly*** that **smart meters were not mandated**. Consistent with the sequence in the series of changes made to the language of § 2807, as previously shown by the provisions stated in ¶¶ 21 and 22, supra, and ***consistent with the explicit statements made by these senators*** *concerning the Senate's* ***final amendments*** *to HB 2200,* ***smart meters were not and would not be mandatory, but were made optional*** to ratepayers. Specifically:

"It also contains language in there that we will have smart meters. **It is not mandated**, but it allows for the deployment of smart meters through a depreciation process, through new home construction process, and through the depreciation of 15 years, and for anyone who wants to purchase a smart meter which they feel will help them manage their electric load better."
—Senator Tomlinson (*Senate Legislative Journal*, p. 2626.) (Underlining and emphasis added.)

"We also made sure that **smart meters would not be mandated** for every single ratepayer. Not only is that a smarter approach to smart meter deployment, but it will also save electric customers hundreds of millions of dollars paying for something that will not provide a real benefit in their own households."
—Senator Boscola (*Senate Legislative Journal*, p. 2627.) (Underlining and emphasis added.)

"In addition, **we did not mandate smart meters**, but **we made them optional**. We did say in new construction, where they really are practical, they will be put in."
— Senator Fumo (*Senate Legislative Journal*, p. 2629.) (Underlining and emphasis added.)

As thus amended by the Pennsylvania Senate on the matter concerning smart meters, the final version of HB 2200, ***with the amendments making smart meters non-mandatory***, was passed by the Senate by an overwhelming majority of **47 to 3**. (*Legislative Journal - Senate*, October 8, 2008, p. 2631.) The bill was then returned to the Pennsylvania House for a final vote.

To the Speaker of the House's question: "**Will the House concur in Senate amendments?**", HB 2200 as amended by the Pennsylvania Senate was passed by the Pennsylvania House of Representatives by an overwhelming majority of **186 to 4** such that "...**the question was determined in the affirmative and the amendments were concurred in**." (*Legislative Journal of the Pennsylvania House of Representatives***,** dated October 8, 2008, p. 2327.) (Underlining and emphasis added.)

HB 2200 was thus enacted by the Pennsylvania General Assembly and signed into law as Act 129 by then-Governor Rendell.

24. It is unequivocally clear that the ***prevailing* legislative intent** enacted into law by Act 129 expresses the Pennsylvania General Assembly's direction that **smart meters were not made and would not be made mandatory**.

25. Nonetheless, according to the PA PUC, the PA Supreme Court, in its *'Povacz II'* ruling (Aug. 2022), "found that Section **2807(f)(1)**, when read in conjunction with Section **2807(f)(2)**, provides instructions for furnishing smart meters to ***all*** customers." (PUC Public Meeting, Nov. 9, 2023.) **However, the Supreme Court failed to consider the Legislature's clear direction given in Section 2807(f)(2) of Act 129.**

(See also ATTACHMENT II, 'Select Quotations of the PA Commonwealth Court in *Povacz, et al. v. Pennsylvania Public Utility Commission*' which concur with the Complainants' detailed analysis, supra, and which are wholly consistent with the prevailing legislative intent of, and direction given by, the Pennsylvania General Assembly as to whether or not smart meters were mandated pursuant to Act 129.)

26. The Pennsylvania Public Utility Commission has jurisdiction over the state's public electric utility companies.

27. The Commission does not have statutory authority or jurisdiction over the public's right to deny consent.

28. The PA PUC has authority to mandate that PPL Electric and the state's other electric utility companies ***offer*** AMI wireless smart meters for use by the public, but the Commission cannot, especially in the absence of specific direction given by the Pennsylvania Legislature to do so, mandate or require that the utilities install smart meters on the private properties of persons who do not want or do not consent to them.

MATTERS of LAW: ARGUMENTS

The policy of mandatory installation of AMI smart meters that has been adopted by the Pennsylvania Public Utility Commission and implemented by the electric utility companies is the product of a complete misinterpretation and misconstruction of the prevailing legislative intent of the Pennsylvania General Assembly as such was set forth and enacted into law under Act 129.

Accordingly, insofar as the enforcement of § 2807(f)(2) under Act 129 were to have remained in keeping with the expressed, prevailing legislative intent of the General Assembly, PPL Electric Utilities and the state's other regulated electric utility companies have **no basis in law** pursuant to Act 129 to terminate electric service to customers who do not give consent to the installation of AMI smart meters on their homes or properties.

Furthermore, in the absence of a compelling governmental interest, the State is ***prohibited*** from ***making*** **or enforcing** ***any*** **law** such as Act 129 which would have the effect of depriving citizens of their fundamental rights protected under the Constitution of the United States. Even if the state were to have a compelling interest in having enacted Act 129, the law must be narrowly drawn such that the ***least restrictive means possible*** are used to achieve its objectives.

Despite the prevailing legislative intent of Act 129 which did not mandate smart meters, the fact that the language set forth in § 2807(f)(2) does not *explicitly* state that customers can opt out of having these meters installed has rendered Act 129 vulnerable to the misinterpretation and misconstruction that has resulted in the Commission's present policy mandating smart meters.

Surmising and constructing its interpretation of Act 129 from the existing vagueness in the language set forth in § 2807(f)(2), while providing no more justification for having mandated smart meters than a tenuous **belief**, the Commission revealed its decision to introduce and impose its own meaning and intent into the law:

> "The Commission believes that it was the intent of the General Assembly to require all covered [Electric Distribution Companies] to deploy smart meters system-wide when it included a requirement for smart meter deployment 'in accordance with a depreciation schedule not to exceed 15 years.'" (Commission's *Smart Meter Implementation Order,* also referenced in ¶ 2, *supra.*)

The Pennsylvania Public Utility Commission's policy mandating smart meters constitutes ***administrative overreach*** and was made possible only because of this vagueness in the language of § 2807(f)(2). The Commission, however, is charged with implementing and enforcing the law **pursuant to the law's actual, legislated intent**, not with second-guessing the expressed will of the Legislature to make new law.

Not only does the Commission's policy mandating smart meters not comport with the *Overbreadth Doctrine*, insofar as the language of § 2807(f)(2) is vague and thus open to such misconstruction and misapplication, Act 129 itself fails to comport with the ***Vagueness Doctrine*** which requires statutes to be clear and well-defined and to adequately describe or specify statutory regulations as to precisely what, under what conditions, and the means by which they are to regulate.

Therefore, because the Commission's policy, mandating smart meters pursuant to Act 129, is predicated entirely upon § 2807(f)(2), is excessively restrictive and harmful in its effect upon citizens' fundamental rights protected under the Fourth, Fifth, Ninth and Fourteenth Amendments to the Constitution of the United States, and, as previously put forth, ***denies*** a select faction of citizens the ***equal protection of the laws***, this policy is, in and of itself, unconstitutional.

PPL Electric Utilities and the state's other electric utility companies therefore have no basis in law, pursuant to the Commission's policy mandating smart meters, to terminate electric service to customers who do not give consent to the installation of AMI smart meters on their homes or properties.

It is the Commission's inherently unconstitutional policy of mandating smart meters that has opened the door to the wrongful and unlawful acts committed by PPL Electric Utilities and other state-regulated electric utility companies, enabling them as 'State actors', or agents of the State (See **Attachment I, '*State Action Doctrine*'**), to carry out their smart meter programs **by means of harassment, threats, intimidation and coercion—all under color of law**.

These violations therefore give rise to actionable cause under the Fourth, Fifth, Ninth and Fourteenth Amendments to the Constitution of the United States. (Were the Complainants to seek relief and redress of their grievances in the courts, protection of their rights under these amendments to the Constitution could be further secured and pursued under USC 18 Section 241, USC 42 Section 1983, USC 42 Section 1985(3), and USC 42 Section 1986.).

SUMMARY and CONCLUSION:

Because, in the enactment of Act 129, the Pennsylvania General Assembly's direction and ***explicitly expressed*** legislative intent was that smart meters were "**not mandated**" **and** "**would not be mandated**,"

and

because the Pennsylvania Public Utility Commission's enforcement of its policy mandating smart meters pursuant to the Commission's misconstruction and improper interpretation of Act 129,

(1) is in direct violation of citizens' rights protected under the Fourth, Fifth, Ninth and Fourteenth Amendments to the Constitution of the United States,

(2) does not meet the ***strict scrutiny standard*** of satisfying a ***compelling*** governmental interest in the ***least restrictive means possible***,

(3) does not comport with the ***Vagueness Doctrine*** as set forth by the U.S. Supreme Court,

(4) does not comport with the ***Overbreadth Doctrine*** as set forth by the U.S. Supreme Court, and

(5) deprives citizens of ***due process*** and of the ***equal protection of the laws***,

it is, in accordance with the Pennsylvania Constitution and the laws and Constitution of the United States, lawfully binding and incumbent upon the Commission to grant relief to the Complainants.

EXCEPTION NO. 3: The ALJ erred in dismissing the Complainants' Amended Complaint by largely relying upon conclusions of law that directly conflict with both the Commonwealth Court's decision in *Povacz* and the prevailing legislative intent of the Pennsylvania General Assembly and also by failing to acknowledge the full depth and scope of PPL Electric's responsibility to its customers pursuant to Pa. C.S. § 1501. (All statements under EXCEPTION NO. 2, supra, are incorporated hereunder.)

On page 17 of her Initial Decision, ALJ Barnes stated the following two (2) 'conclusions of law' that directly conflict with the Commonwealth Court's decision in Povacz:

No. 15. "PPL is legally required to install the RF Mesh meter on the Complainant's property by Act 129 and Commission orders."

and

No. 16. "Nothing in Act 129 permits a customer to "opt-out" of a smart meter installation."

The Commonwealth Court soundly repudiated these assertions by the ALJ, stating:

"**[N]othing in the statutory language affirmatively mandates that customers must allow installation of wireless smart meters**." (Emphasis and underlining added.)

"**[N]nothing in the language of Act 129 facially *requires* every customer to endure involuntary exposure to RF emissions from a smart meter**." (Emphasis and underlining added.)

"Rather, the language of Act 129 seems calculated to support customer ***choice*** in the use of smart meter technology."

> "[I]n considering accommodations to Consumers on remand, the PUC should consider whether accommodations are appropriate ***without*** proof of harm, **so that Consumers may choose to avoid RF emissions from wireless smart meters** ... ." (Emphasis added.)
>
> "... We reverse the PUC's conclusion that it lacks authority to accommodate Consumers' desire to avoid RF emissions from smart meters and vacate the PUC's determination that such accommodation would not be reasonable. ... **On remand, the PUC should consider all reasonable accommodations, including, but not limited to, deactivation of the RF emitting functions of the smart meters; ... and installation of wired rather than wireless smart meters, if (as Consumers contend) such technology is available**." (Emphasis and underlining added.)

Indeed, Pa. C.S. § 1501 provides that:

> "Every public utility **shall furnish** and maintain adequate, efficient, **safe**, **and reasonable** service and facilities, ***and*** **shall make all** such repairs, changes, alterations, **substitutions**, extensions, and improvements in or to such service and facilities as shall be necessary or proper for the **accommodation**, **convenience**, and **safety** of its patrons, employees, and the public."

Paraphrasing another Pennsylvania public utility customer: The PUC Administrative Law judges and the Commission pretend to allow citizens to be heard, but subvert the law, as written and intended, to their liking, ... and then place the burden of proof on citizens to defend themselves and the law.

EXCEPTION NO. 4: By illogically concluding, in her interlocutory Order, that merely because the Complainants had not provided copies of their medical records in response to PPL Electric Utilities' Interrogatories to Complainants Set I, No. 4, the Complainants "will not experience any medical conditions or issues from the installation of PPL Electric's AMI meter," ALJ Barnes thus erred in granting PPL Electric's Motion for Sanctions. (See Order Granting PPL Electric Utilities Corporation's Motion in Limine and Motion for Sanctions, https://www.puc.pa.gov/pcdocs/1664299.docx , Page 2, Order No. 4.)

In their **Answer in Opposition to Motion for Sanctions** (https://www.puc.pa.gov/pcdocs/1660744.pdf), and in their **Motion to Remove Sanctions** (https://www.puc.pa.gov/pcdocs/1674878.pdf), their **Reply to Respondent's Answer in Opposition to Motion** (https://www.puc.pa.gov/pcdocs/1677941.pdf**),** and their **Amended Motion to Remove Sanctions** (https://www.puc.pa.gov/pcdocs/1678681.pdf), the Complainants have shown clearly and conclusively that Respondent PPL Electric's argument in support of its Motion for Sanctions was logically incoherent and unsound on its face and, based entirely upon specious reasoning, was therefore completely without merit. The Complainants' medical records absolutely were NOT, any more than were their drivers' licenses, materially relevant to their Complaint, and ALJ Barnes, by accepting the Respondent's fallacious argument, erred in failing to recognize or acknowledge that fundamental fact.

The Respondent spuriously has argued that the Complainants' medical information is "necessary to determine whether the installation of a PPL Electric AMI meter will cause or contribute to any adverse medical conditions or biological effects that the Complainants assert they may experience."

The Respondent fallaciously has attempted to justify the preceding contention by further asserting that "[w]ithout medical records documenting the health and medical conditions of the Complainants before a PPL Electric AMI meter is installed there is no reasonable basis upon which the Commission could determine that any health or medical conditions the Complainants assert they may exhibit after a PPL Electric AMI meter is installed were caused by the AMI meter. The pre-installation medical records are essential to determining whether any post-installation condition asserted by the Complainants could have actually been caused by the AMI meter; without such records there is no evidence of a 'status quo' prior to the installation of the AMI meter with respect to the Complainants' health and medical conditions."

If, **after** such time that PPL Electric were to have installed AMI smart meters upon the homes of the Complainants, **then and only then** would the Complainants' medical records possibly be relevant, depending on whether the Complainants were to claim to have experienced adverse health effects as a result of the meters. It absolutely is not necessary to establish evidence of a 'status quo' with respect to the Complainants' health and medical conditions **prior to** the installation of PPL Electric's AMI meters. If the Complainants were to complain to the Commission of adverse health effects at a time following the installation of PPL Electric's AMI meters, the Complainants' medical records provided **at that time** certainly would contain all pre- and post-installation medical information—including dates of any and all diagnoses and treatments—necessary for establishing a reasonable basis upon which the Commission could make a proper determination.

Therefore, because PPL Electric's meters have not been installed to date on the Complainants' homes, in addition to the fact that the Complainants have not alleged that they presently have any pre-existing adverse medical or health conditions, the Complainants' medical records are not relevant to their Complaint, and the Respondent's argument, as re-stated in ¶ 10, supra, alleging the present necessity of these records, is invalid.

PPL Electric's flawed argument would further imply that customers could have cause to challenge the safety and/or reasonableness of the Company's AMI meters only **after** the installation of these devices, that is, only after their having been exposed to the RF radiation and fields produced by the installed meters.

Even though we, the Complainants, have not provided our medical records, we have every right under due process, and through means of argumentation and cross-examination, to challenge fully the safety and/or unreasonableness of PPL Electric's AMI meters pursuant to 66 Pa. C.S. § 1501.

However, the sanctions that unjustly and unjustifiably have been imposed by ALJ Barnes upon the Complainants have profoundly adversely affected the Complainants' ability to litigate their case in all subsequent proceedings, including the evidentiary hearing held on August 6, 2020. Because of the sanctions, the Complainants specifically were precluded from cross-examining the Respondent's expert witnesses and from asserting any claim or entering any evidence into the record that would support allegations challenging the reasonableness of the installation of PPL Electric's smart meters insofar as such were to concern issues of health and safety.

The Complainants consequently have been unjustly deprived of fully exercising their rights under due process, with the result that the Complainants' case has suffered severe prejudice and has been obstructed and encumbered with an utterly incomplete record, as reflected in the Initial Decision of ALJ Barnes.

Additionally, the Commonwealth Court has concluded that Act 129 does not preclude accommodations of customers' health concerns, **regardless of proof of harm**. (*Povacz et al. v. Pennsylvania Public Utility Commission*, No. 492, C.D. 2019.) Because both the Respondent's Interrogatories request for the production of Complainants' medical records and the ALJ's Order granting PPL Electric's Motion for Sanctions were predicated on requiring the Complainants to produce their medical records to show or prove harm or the potential for harm resulting from the installation of PPL Electric's AMI smart meters, it is appropriate and lawful that the ALJ's Interlocutory Order granting sanctions be reversed and the sanctions be removed.

It is just and proper that the Commission not preclude the Complainants from exercising their rights provided under the Constitution of the United States to protect themselves from any act by the State or agent of the State which would condition Complainants' access to electricity, a basic and vital necessity of modern life, upon the use of their very homes and property in such a way that Complainants would be forcibly and involuntarily exposed, in perpetuity, to RF, an agent which, on the basis of sufficiently strong scientific evidence, has been specifically identified and classified as a possible human carcinogen and associated positively with biological hazard and risk.

The Complainants clearly should not have been, and should not continue to be, precluded from exercising their due process right to fully litigate claims that radiofrequency radiation and RF fields resulting from the operation of PPL Electric's AMI meters, were such devices to be installed on the Complainants' homes, potentially could cause or increase the risk of future biological and/or adverse health effects.

The Complainants therefore have filed this **Exception** to the ALJ's Interlocutory Order granting sanctions that previously have been imposed upon them and which have deprived them of due process, which, in accordance with "the principles of common fairness," would have permitted them the "opportunity to be heard on the issues" (*Hess v. Pa. PUC*, 107 A.3d 246, 266 (Pa. Cmwlth. 2014)) and to "conduct such cross-examination as may be required for a full and true disclosure of the facts." (66 Pa. C.S. § 332(c).)

EXCEPTION NO. 5: In granting Respondent PPL Electric's Motion in Limine, ALJ Barnes (1) erred in failing to admit entry into the record a number of the Complainants evidentiary exhibits that satisfy the criteria set forth in 52 Pa. Code § 5.406(a)(1) and/or §5.406 (a)(2) for public documents, and (2) acted to effectively block, to an unreasonable degree, entry into the record of many of the Complainants' evidentiary exhibits which fully satisfy the evidentiary standards and criteria set forth in Subsection C of Section II, 'Legal Standards' (supra), as highly relevant, highly credible and reliable evidence of definite probative value.

In both their **Amended Complaint** (https://www.puc.pa.gov/pcdocs/1636175.pdf) and their **Motion in Opposition to PPL Electric's Motion in Limine** (https://www.puc.pa.gov/pcdocs/1660960.pdf), the Complainants brought forth a voluminous amount of highly relevant, highly credible and reliable evidence of definite probative value which would constitute a preponderance of evidence acceptable to any reasonable mind that forced, chronic, long-term exposure, even at very low levels, to the radiofrequency radiation and RF fields produced by PPL Electric's AMI wireless smart meters poses a substantive risk to health and safety, and it is therefore absolutely **NOT reasonable** for either PPL Electric or the Commission effectively to compel customers to endure such exposure in perpetuity as a condition of receiving electric service.

A substantial number of the evidentiary exhibits brought forth by the Complainants in both their **Amended Complaint** and their **Motion in Opposition to PPL Electric's Motion in Limine** were, in accordance with 52 Pa. Code § 5.406(a)(1) and/or §5.406 (a)(2), **public documents**.

Copies of a flash drive (or 'thumb' drive) containing the Complainants' evidentiary exhibits had been submitted along with their Amended Complaint to the Respondent, ALJ Barnes, and the PUC Secretary's Bureau. Copies of another flash drive containing the Complainants' 'Additional Evidence' had been submitted likewise to the same parties. Partial transcripts of the contents of many of these exhibits are viewable by downloading copies of the **Amended Complaint** (https://www.puc.pa.gov/pcdocs/1636175.pdf) and the Complainants' **Motion in Opposition to PPL Electric's Motion in Limine** (https://www.puc.pa.gov/pcdocs/1660960.pdf) Complete copies of the **Amended Complaint** and many of the Complainants' evidentiary exhibits are viewable and downloadable from:
https://drive.google.com/drive/folders/1MEppT6HqTZQXQs7LqKoPvzfOSK5iqiRF?usp=sharing and
https://drive.google.com/drive/folders/12D_pEtvayVFfWDfUTTRaKm2aOx5dJ1DS ('Additional Evidence').

Those of the Complainants' evidentiary exhibits which satisfy public documents criteria under §§ 5.406(a)(1) and/or 5.406(a)(2) include, but are not limited to:

(In Amended Complaint)
EXHIBIT 1B
Expert Report of Andrew A. Marino. https://andrewamarino.com/PDFs/testimony-AAM_Report.pdf

EXHIBIT 4A
Letter from Dr. Norbert Hankin, PhD, Center for Science and Risk Assessment, and Frank Marcinowski, Director, Radiation Protection Division, U.S. Environmental Protection Agency, 2002

EXHIBIT 4B
Letter of recommendations to the FCC from Margo T. Oge, Director, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency (ET Docket No. 93-62)

EXHIBIT 4E
Letter from the Director, Office of Environmental Policy and Compliance, U.S. Department of the Interior, to the National Telecommunications and Information Administration, U.S. Department of Commerce

EXHIBIT 13
U.S. Congressional hearing testimony given by Dr. Ronald B. Herberman, MD, Dr. David O. Carpenter, MD, et al., on RF radiation exposure and cell phone usage

EXHIBIT 14
Health Effects of Cell Phone Use. U.S. Senate hearing testimony of Dr. Devra L. Davis, PhD, MPH, University of Pittsburgh Professor of Epidemiology ...

EXHIBIT 19E
International Encyclopedia of Neuroscience - *Electromagnetic fields, the modulation of brain tissue functions — A possible paradigm shift in biology*. Dr. W. Ross Adey, MD, Distinguished Professor of Physiology, Loma Linda University School of Medicine

EXHIBIT 20C
DNA damage in Molt-4 T-lymphoblastoid cells exposed to cellular telephone radiofrequency fields in vitro. Phillips, JL, et al., Bioelectrochemistry and Bioenergetics 45 (1998) 103–110. Pettis VA Medical Center, Loma Linda

EXHIBIT 21C-5
Evaluation of the Potential Carcinogenicity of Electromagnetic Fields. U.S. Environmental Protection Agency Office of Environmental and Health Assessment Office of Research and Development, October, 1990

EXHIBIT 22A
IARC/WHO Press Release No. 208, 31 May 2011

EXHIBIT 23
NTP Technical Report on the Toxicology and Carcinogenesis Studies in Hsd:Sprague Dawley Sd Rats Exposed to Whole-Body Radio Frequency Radiation at a Frequency (900 MHz) and Modulations (Gsm and Cdma) Used By Cell Phones. U.S. National Toxicology Program Final Report, November 1, 2018

EXHIBIT 29C-4
County of Santa Cruz proposed ordinance with attached memorandum entitled ***Health Risks Associated with SmartMeters***

EXHIBIT 30E
Letter from U.S. Food and Drug Administration Jefferson Laboratories, National Center for Toxicological Research to National Toxicology Program, National Institute for Environmental Health Sciences, NIEHS, dated May 19, 1999.
https://ntp.niehs.nih.gov/ntp/htdocs/chem_background/.../wireless051999_508.pdf

EXHIBIT 44L-1
Congressional Staff Briefing. *Electromagnetic Fields: The Science on Human Health Effects*. Dr. Ted Litovitz, PhD

EXHIBIT 6G (on web, not in Amended Complaint)
Electromagnetic Field Effects on Cells of the Immune System: The Role of Calcium Signalling. J. Walleczek, Research Medicine and Radiation Biophysics Division, Lawrence Berkeley Laboratory, July 1991, with support by Office of Biological and Environmental Research, U.S. Dept. of Energy

(See also **Attachment III, 'Testimonies Given By Eminent Scientific And Public Health Experts On Matters Concerning Smart Meter Safety'.**)

(In 'Additional Evidence')

EXHIBIT 5
Effects of ELF Fields on Calcium-Ion Efflux from Brain Tissue in Vitro. Carl F. Blackman, et al., Health Effects Research Laboratory, U.S. Environmental Protection Agency (https://www.jstor.org/stable/3575923?read-now=1&seq=1)

EXHIBIT 6
Health Effects of Transmission Lines - U.S. House of Representatives Oversight Hearing - Statement of Sheldon Meyers, Director, Office of Radiation Programs, U.S. Environmental Protection Agency (https://babel.hathitrust.org/cgi/pt?id=pst.000013370435&view=1up&seq=1)

EXHIBIT 10
National Toxicology Program Peer Review of the Draft NTP Technical Reports on Cell Phone Radiofrequency Radiation (March 26-28, 2018) (https://ntp.niehs.nih.gov/ntp/about_ntp/trpanel/2018/march/peerreview20180328_508.pdf)

EXHIBIT 12
Biological Effects of Electromagnetic Radiation (Radiowaves and Microwaves) - Eurasian Communist Countries. Defense Intelligence Agency, U.S. Army Medical Intelligence and Information Agency

EXHIBIT 15
Partial Results of NTP Chronic Carcinogenicity Studies of Cell Phone Radiofrequency Radiation in Rats. Linda S. Birnbaum, PhD, Director, NIEHS, National Toxicology Program (https://ehtrust.org/wp-content/uploads/Linda-Birnbaum-.pdf)

In her interlocutory Order granting PPL Electric's Motion in Limine, issued in indiscriminate, blanket fashion, and with no reason or reasons given, the ALJ erred in denying any and all of the Complainants' exhibits that fully satisfied either or both of the criteria set forth in §§ 5.406(a)(1) and 5.406(a)(2).

EXCEPTION NO. 6: The ALJ erred in dismissing Complainants' Complaint on the basis of concluding that the Complainants failed "to prove by a preponderance of evidence that the installation of this smart meter constitutes unsafe or unreasonable service under 66 Pa. C.S. § 1501." (Initial Decision, p. 14.)

The Complainants have shown copiously and conclusively by having brought forth **public documents**, findings of multiple peer-reviewed scientific studies, and even a definitive medical handbook on the biological effects of electromagnetic fields, all demonstrating a preponderance of evidence that:

(1) It is incontrovertibly the case that the FCC safety guidelines for RF exposure do NOT account for all possible mechanisms of interaction of RF with biological structures and systems, and

(2) The science is settled **beyond reasonable doubt** that such interactions in fact can and do occur which do NOT involve thermal mechanisms or acute exposure to RF.

By continuing the pattern followed in other smart meter cases, of misplacing the burden upon the Complainants such that they are required to conclusively prove harm by producing a preponderance of evidence that wireless smart meters are unsafe, the ALJ has failed to consider the FACT that **there is absolutely no established guideline or standard of safety** that would protect against any of the non-thermal mechanisms of interaction for RF that are known to exist. This fact, among others, directly speaks, pursuant to 66 Pa. C.S. § 1501, to the utter **unreasonableness** of forcing the Complainants to endure chronic, long-term exposure to the RF radiation and fields produced by PPL Electric's AMI meters as a condition of their continuing to receive electric service.

PPL Electric should no longer be permitted, on procedural grounds and at the expense of the Complainants' rights to discovery and due process, to escape the legal ramifications following from the **FACTS** (most of which the Commission and the Administrative Law Court certainly are aware) that:

1) Based upon **sufficiently strong evidence** for **increased risk** of certain cancers, RF radiation and fields have been classified by the WHO/IARC as a possible human carcinogen (Group 2B). This classification **applies to all RF radiation and fields, regardless of source**.

2) In its **intensively peer-reviewed final report**, the National Toxicology Program (NTP) of the National Institute of Environmental Health Sciences (NIEHS) and National Institutes of Health (NIH) published findings of **"clear evidence"** of cancer causation in animal test subjects exposed to RF radiation at 900 MHz, which very closely approximates the frequency transmitted by PPL Electric's AMI meters.

3) To *forcibly* subject persons to chronic, long-term exposure to a definitely possible human carcinogen is to *forcibly* subject them to chronic, long-term exposure very possibly to a definite human carcinogen.

4) On September 25, 2008, at a U.S. House subcommittee hearing on cell phone radiation, Dr. Julius Knapp, then-Director of the Office of Engineering & Technology, Federal Communications Commission, testified that: "The FCC staff is not sufficiently qualified to speak with authority to the science of health effects of RF absorption in the bodies—body." He further testified: "The FCC doesn't have the expertise to evaluate whether the standard is appropriate protection level for the cases that were discussed here."

5) The FCC safety guidelines pertaining to RF exposure do **NOT** account for causal mechanisms of interaction that do not involve tissue heating or acute exposures such as electric shock. On the basis of **overwhelming evidence**, science has established **beyond reasonable doubt** that, with respect to interactions of RF with biological structures and systems, there definitely **are** causal mechanisms active with RF exposure **other than** ones that involve tissue heating or electric shock, and the FCC safety guidelines simply do **NOT** apply to these other mechanisms.

6) There currently is **no guideline or set standard of safety** that applies to any of these other non-heating (non-thermal) and non-acute mechanisms of interaction such that there are established levels or durations of exposure of humans to RF below which such exposures can be considered safe.

7) According to testimony given on October 6, 1987 at a subcommittee hearing of the U.S. House of Representatives by Sheldon Meyers, then-Director of the Office of Radiation Programs of the U.S. Environmental Protection Agency: "empirically, **it is not possible to assign a low intensity limit or threshold below which the exposures are without effect.**" ... "The research information now available, both from EPA and others, **demonstrates that biological systems do respond** when exposed to ELF fields." (Underlining and emphasis added.)

8) AMI wireless smart meter devices (and AMI wireless mesh networks) have never been tested for safety specifically with regard to the potential hazards and risks posed by the forms and manner in which they produce radiofrequency radiation and RF fields. (Note: A study in New Zealand, referenced in a previous Commission hearing and entitled: *Health and Safety Aspects of Electricity Smart Meters*, is an industry-sponsored report focusing primarily on a relative comparison between smart meters and cell phones with regard to RF emission levels. In fact, it is reported in this paper that: "research papers continue to be published concerning non-thermal, biological effects of SARs **much lower than those specified in the standards**, including by well respected teams and individuals [Salford et al]. Many more such papers are listed in the WHO EMF project database." (Emphasis and underlining added.)

9) There have been no proceedings initiated by a motion of the Commission pursuant to 66 Pa.C.S. §315(c) requiring regulated electric utilities, including the Respondent, to prove or show specifically that their AMI wireless smart meter devices and facilities are in fact safe, particularly with regard to the forms and manner in which they emit, transmit and/or otherwise produce radiofrequency radiation and RF fields.

It is utterly ludicrous to expect, given the preceding facts, that chronic, long-term, forcible exposure to even low levels of RF radiation and fields produced by AMI wireless smart meters, which have never been tested specifically for safety, should be accepted in any way as '***reasonable***'**.** As the Complainants, in their Amended Complaint, previously have stated:

"This complaint is NOT simply about opting out of installation of wireless smart meters. It is about deprivation by government of our most fundamental and sacrosanct liberty—the right to protect and defend ourselves and our family, our health, our property and our homes. It is about actions taken by PPL and the Pennsylvania Public Utility Commission which *directly* violate and deprive us of these rights that are secured under the Pennsylvania Constitution and the laws and Constitution of the United States.

"No rational, impartial, unbiased person of sound reason who views the demonstrations and thoroughly reads and adequately understands the overall compelling scientific evidence, scientists' testimonies and pertinent information brought forth in this complaint would conclude or could honestly claim in earnest that chronic, continual, day-and-night, long-term exposure to radiofrequency radiation and electromagnetic fields produced by wireless smart meters is safe and without hazard or substantive risk of adverse effect upon public health and safety and that such exposure cannot, could not, does not, and will not cause harm to the people and citizens of this state.

"For the State, or an agency or agent acting under authority of the State, while being entrusted with protecting the health and safety of its millions of citizens, to not inform them of the scientifically substantiated hazards and risks of exposure to radiofrequency radiation and electromagnetic fields, but to instead forcibly subject them, through means of coercion under color of law, to involuntary, chronic, long-term radiofrequency irradiation and exposure to RF electromagnetic fields produced by wireless smart meter devices and technology, constitutes, at minimum, the commission by the State, and/or its officials and agents, of an egregious breach of trust and a gross, unlawful transgression and injustice against the people."

EXCEPTION NO. 7: The ALJ erred utterly in her determination that "PPL is not a 'state actor'" and in her assertion, citing *Jackson v. Metropolitan Edison Co.*, 419 U.S. 345 (1974), that PPL simply "is a private, regulated utility company not constrained by the Fourth Amendment." (Initial Decision, p. 13.)

In their Amended Complaint, the Complainants have fully set forth in great detail the reasons why PPL Electric most certainly is a 'state actor' in the instant case. A document entitled **'State Action Doctrine'** (**Attachment I)** which immediately follows the present document and conclusively shows that the ALJ's opinion is completely misguided.

EXCEPTION NO. 8: In addressing the Complainants' privacy concerns (Initial Decision, pp. 13-14), the ALJ's analysis is perfunctory at best and fails to take into consideration important fundamental differences between circumstances in the Naperville case and the conditions concerning the privacy of smart meter data as they currently exist in Pennsylvania. The ALJ also erred in completely ignoring the allegation brought forth in the Complainants' Amended Complaint that the manner and degree to which PPL Electric uses smart meters to collect and transmit customer data constitutes electronic surveillance as defined and expounded under 50 U.S.C. 36, Subchapter I, §§ 1801(f), 1809(a), 1810, and 1812.

Although the Appeals Court in *Naperville* also found that the municipality's 'search' was reasonable, **it explicitly cautioned that its holding depended "on the particular circumstances of this case**." (Underlining and emphasis added.)

In reaching its opinion in *Naperville*, the Court took into account the following fundamental facts:

> 1) Naperville's utility, which is publicly-owned, had adopted a clarifying "Smart Grid Customer Bill of Rights" policy pledging that **customers' data will *not* be provided to third parties, including law enforcement, without a warrant or court order**; and
>
> 2) The collection interval of customer data by the use of smart meters in that case was **not less than fifteen minutes**.

The Court in *Naperville* additionally admonished: "**Were a city to collect the data at shorter intervals, [its] conclusion could change**."

That Court also asserted that its "**conclusion might change if the data was more easily accessible** to law enforcement or other city officials **outside the utility**."

The Pennsylvania Public Utility Commission has **directed** that the smart meter technology of covered EDCs, including PPL Electric, **must support** at least the following capabilities:

> 1) Ability to provide 15-minute **or shorter** interval data **to** customers, EGSs, **third-parties** and the regional transmission organization ("RTO") on a daily basis, consistent with the data availability, transfer and security standards adopted by the RTO.
>
> 2) **Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible**.
>
> 3) Ability to **remotely program** the meter.

The PA PUC has given PPL and the state's other electric utilities free reign to collect customer data at sub-15-minute intervals with no lower limit to granularity. (See assertion 14, supra.)

The level of vulnerability of customers' privacy and the potential for misuse and abuse of the data collected from them by PPL also differ radically from the circumstances in the *Naperville* case, where **customers' data was not to be provided to third parties**, including law enforcement, without a warrant or court order.

If the Court in *Naperville* had been given to scrutinize the same set of circumstances as presently exist in Pennsylvania with regard to widespread third-party access to, and the vulnerabilities and potential abuses of, utility customers' data, there is very little doubt that the Court would have found the **nonconsensual collection** and transmission of such data, via wireless smart meters and pursuant to PPL's privacy policy and Commission-approved, *WPWG Technical Implementation Standard*, as **not** being among the "few exceptions" sufficient to pass Fourth Amendment muster as a reasonable, warrantless search of one's home. (See *Kyllo v. United States*, 533 U.S. at 31.)

PPL's collection, at intervals of 15 minutes and through the use of smart meter technology, of aggregate quantities of more of the Complainants' usage data than is customary and minimally necessary for generating a monthly bill constitutes a search under the Fourth Amendment. PPL's 24/7 collection of the Complainants' data, which is mandated to occur at intervals of 15 minutes or less **with no lower limit**, and such that, without the Complainants' consent, **their data may be shared by PPL with third parties** who may de-anonymize and disaggregate that data, constitutes an abridgement and deprivation of the Complainants' Fourth Amendment right to a reasonable expectation of privacy.

If, pursuant to the Pennsylvania Public Utility Commission's policy mandating smart meters, and thus acting under color of law as a state actor or agent of an agency of the State, PPL proceeds—by means of threatening to terminate our access to vital electric service—to coerce our consent to the installation on our home of an AMI wireless smart meter device, PPL's subsequent use of that device, in perpetually collecting and transmitting from our home more data with content of a personal and private nature than is customary and minimally necessary for generating a monthly bill, shall be ***without our consent*** and shall constitute **electronic surveillance** as defined and expounded under 50 U.S.C. 36, Subchapter I, §§ 1801(f), 1809(a), 1810, and 1812.

On pp. 309-365 and pp. 377-384 of their **Amended Complaint** (https://www.puc.pa.gov/pcdocs/1636175.pdf), and on pp. 317-381 of their **Motion in Opposition to PPL's Motion in Limine** (https://www.puc.pa.gov/pcdocs/1660960.pdf), the Complainants have presented their case concerning matters of privacy of smart meter data in much greater and more complete detail.

IV. SUMMARY

The right to protect oneself from harm, *possible* harm, and/or risk of harm is the most fundamental of individual liberties without which health, happiness and the enjoyment of life would be unduly burdened and unjustifiably made difficult or impossible.

The picture emergent from the pattern established by these proceedings vividly illustrates why **no government, and no persons, regardless of what they may be persuaded to believe, should have the authority or wield power so profound as to have determination and control over matters of health and well-being of others so as to decide even the conditions under which they must live in their own homes. For if those with such power are wrong in their belief, they shall have been party to the commission of a terrible injustice and moral crime against their fellow human beings in the misguided exercise of that power.**

In support of the Exceptions brought forth before the Commission, the Complainants assert the following:

1. In accordance with Title 66 of the PA Consolidated Statutes § 2807(f)(2)(iii) and § 2807(f)(7), the phrase, 'depreciation schedule not to exceed 15 years', referenced in Provision (iii) of Paragraph 2, applies specifically to **new** smart meter technology, and the Commission's policy mandating smart meters is thus founded upon a misconstruction of the legislative intent and direction given by the PA General Assembly in its enactment of Act 129 into law.

2. Act 129 neither compels nor permits the PA Public Utility Commission to adopt an interpretation of Title 66 § 2807(f)(2) and § 2807(f)(7) under the Act as a mandate that would require PPL and other public electric utilities in the state to install AMI wireless smart meters on the homes and properties of customers who do not want or do not consent to them. One would have to read text into the statute that is not already there to reach the Commission's conclusion that smart meters are mandatory.

3. The PA Public Utility Commission exceeded its statutory authority by making the installation of AMI wireless smart meters mandatory for all customers of PPL and other of the state's public electric utilities.

4. Title 52 of the Pa. Consolidated Statutes § 56.81(3) and Title 66 § 1406(a)(4) apply to meters, only to meters, and to nothing but meters, that is, to devices with the functional capability of doing nothing more or other than to measure electric power usage such that electric utility companies are able to bill according to the actual amount of electricity used. These statutes do NOT apply to powerful, RF radiation-emitting and RF signal-transmitting antennas or to whatever multiplicity of devices the State and/or electric utilities may decide to package together and conveniently call a 'meter'.

5. Pursuant to Title 52 of the Pa. Consolidated Statutes § 56.81(3) and Title 66 § 1406(a)(4), PPL has threatened to terminate the Complainants' access to electric service solely on the basis of our not giving consent to the Company's installation of AMI wireless smart meters on our homes.

> Under these statutes, a termination of service is authorized for a customer's "[f]ailure to permit access to meters, service connections or other property of the public utility for the purpose of replacement, maintenance, repair or meter reading."

6. The Complainants have ***never*** denied PPL Electric Utilities access to the company's meter for any purpose **that is properly and conclusively *proven* to be *safe*** and which would not deprive or be in violation of the Complainants' fundamental rights. This includes allowing PPL access for the purpose of replacement of the meter.

7. The Complainants simply have denied the company permission to install a powerful, FCC-regulated, RF radiation-emitting and RF signal-transmitting device which is far more than merely a meter and for which **there is no reliable medical or scientific evidence upon which to conclude that chronic, long-term exposure to the radiofrequency radiation and RF fields produced as a result of the installation of such metering devices could not, cannot, would not and will not cause, exacerbate or contribute to biological or adverse health effects.**

8. In its actions to compel the Complainants' consent by means of threats and coercion, while also acting pursuant to the Commission's policy mandating wireless smart meters, PPL has acted under color of law as an agent of the State and is, according to the U.S. Supreme Court's State Action Doctrine, a 'State actor'.

9. PPL's actions pursuant to the Commission's policy of mandating the installation of smart meters would force the Complainants' properties to be used by PPL for purposes other than the collection of the Complainants' electricity usage data. That is, the Commission's policy would allow PPL to forcibly use its AMI wireless smart meters on the Complainants' homes as "relay points to transmit data" that does not originate from the Complainants' properties. PPL, **acting with the imprimatur either of the Commission or of the State itself**, thus would be given usage of the Complainants' properties without such usage having been granted either by the existing easement or by the Complainants' informed consent. PPL's actions and the Commission's policy pursuant to Act 129 therefore violate the Complainants' property rights protected under the Fourth, Fifth, Ninth and Fourteenth Amendments to the Constitution of the United States.

10. PPL Electric Utilities does **not** have the statutory authority or right to site powerful, radiofrequency radiation-producing, RF-transmitting, data communications devices on the Complainants' properties and to thereby physically affect or cause physical alteration to the ***interior*** environments of the Complainants' homes by means of the production of RF electromagnetic fields, and/or conducted emissions ('high-frequency voltage transients') and/or frequent transmissions of modulated radiofrequency radiation which would add to the already-existing RF radiation burden from other outside sources including area cell phone towers, other smart meters and facilities in the utility company's AMI mesh network, etc.

11. Without the Complainants' consent, PPL Electric Utilities does ***not*** have the statutory authority or right, pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), to **use** the Complainants' homes, and by and through such direct use of the Complainants' own premises, physically alter their living environments in any way which possibly could **increase** their **risk** of sustaining biological or adverse health effects.

12. Without the Complainants' consent, PPL Electric Utilities does ***not*** have the statutory authority or right, pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), to **use** the Complainants' homes, and from their own premises, irradiate them in perpetuity ***as a condition of their continuing to have access to electric service***.

13. The findings by the WHO / IARC (International Agency for Research on Cancer), on the basis of sufficient scientific evidence that RF radiation is a Group 2B, possible human carcinogen, coupled with the findings reported in the highly peer-reviewed, final report of the U.S. National Toxicology Program (NTP) of "clear evidence" of cancer causation in animal test subjects as a result of their exposure to RF radiation, establishes RF radiation as an agent that is capable, through mechanisms other than the thermal heating of tissues, of adversely affecting biological systems at non-thermal levels, that is, at levels below the FCC safety guidelines.

14. To forcibly subject persons to chronic, long-term exposure to a definitely possible human carcinogen, is to forcibly subject them to chronic, long-term exposure very possibly to a definite human carcinogen.

15. Without the Complainants' consent, PPL Electric Utilities does ***not*** have the statutory authority or right, pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), to **use** Complainants' homes in such a way as to irradiate them in perpetuity ***from their own premises*** with what has been found by IARC, on the basis of sufficient scientific evidence, to be ***a Group 2B possible human carcinogen***.

16. Without the Complainants' consent, PPL Electric Utilities, acting pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), has no statutory authority or right, by the company's use of Complainants' homes or properties, to increase the Complainants' risk—***no matter how small***—of biological or adverse health effects as a condition of their having access to electric service.

17. Without the Complainants' consent, the Pennsylvania Public Utility Commission, acting pursuant to Act 129 and/or 52 Pa.C.S. §56.81(3) and/or 66 Pa.C.S. § 1406(a)(4), has no statutory authority or right, through PPL Electric Utilities' use of the Complainants' homes or properties, to increase the Complainants' risk—no matter how small—of biological or adverse health effects as a condition of their having access to electric service.

18. PPL's use of RF-emitting, wireless smart meter devices, in forcibly subjecting the Complainants in perpetuity to the hazards and risks that much scientific research has found to be associated with RF radiation and RF fields, would deprive the Complainants of their most fundamental and basic human right to act to protect themselves from harm, possible harm, and/or risk of harm and so would violate this right which is protected under the Ninth and Fourteenth Amendments to the Constitution of the United States.

19. As clearly enunciated by the U.S. Supreme Court, electricity is a necessity of modern life, and PPL's action to terminate the Complainants' access to electric service, solely on the basis of the Complainants not consenting to the installation of wireless smart meter devices on their homes or properties, would constitute a **cruel and unusual punishment** and would violate the Complainants' rights protected under the Eighth and Fourteenth Amendments to the Constitution of the United States.

20. PPL's collection, at intervals of 15 minutes and through the use of smart meter technology, of aggregate quantities of more of the Complainants' usage data than is customary and minimally necessary for generating a monthly bill constitutes a search under the Fourth Amendment. PPL's 24/7 collection of the Complainants' data, which is mandated to occur at intervals of 15 minutes or less **with no lower limit**, and such that, without the Complainants' consent, **their data may be shared by PPL with third parties** who may de-anonymize and disaggregate that data, constitutes an abridgement and deprivation of the Complainants' Fourth Amendment right to a reasonable expectation of privacy.

From the fact of its having appealed the Commonwealth Court's detailed and very well-reasoned decision in *Povacz* to the PA Supreme Court, it has become even more obvious that the PUC's primary interest regarding these matters certainly has NOT been the protection of public health and safety. Rather, the Commission's primary concern has continued to be the protection of other interests by its having acted with extraordinary insistence and tenacity to preserve, at all costs, its misguided smart meter policy, which was based upon the Commission's own manifestly flawed interpretation of the legislative intent of the Pennsylvania General Assembly as such had been set forth and expressed in the language of Act 129.

As demonstrated by an abundance of facts and deeds, the Pennsylvania Public Utility Commission heretofore has thus shown itself to exemplify the very definition of 'captured agency.'

V. CONCLUSION

For the reasons set forth above, the Complainants respectfully request that the Commission grant these Exceptions and issue a Final Order that rejects the ALJ's Initial Decision of September 22, 2020 and orders PPL Electric Utilities to grant Complainants an accommodation that is in accordance with Section 1501 and which is reasonable and consistent with not only the guidance set forth by the Pennsylvania Commonwealth Court in *Povacz*, but also the actual and true legislative intent of the Pennsylvania General Assembly as set forth in Act 129, such that the Complainants are permitted to simply retain the wired electric meters that are presently installed on their homes.

Respectfully submitted,

Complainants

Dated: November 24, 2023

ATTACHMENT I

STATE ACTION DOCTRINE

In *Jackson v. Metropolitan Edison Co*., 419 U.S. 345 (1974), "a customer sued a privately owned utility under the Civil Rights Act of 1871 for improperly shutting off her service without providing her notice or a hearing. The Supreme Court asked whether there was a close enough nexus between the state and the utility for the acts of the latter to be treated as those of the former. Although the utility was heavily regulated by the state, it was held not to be a state actor. The Court reasoned that the provision of utility service is not generally an 'exclusive prerogative of the State.' Also absent was the symbiotic relationship between the utility and the state found in previous cases." (Congressional Research Service, CRS Report for Congress, Document R42338, February 3, 2012.)

"Though its holding [in *Jackson*] was broad **the Court did not foreclose the possibility that a privately owned utility could be a state actor under different circumstances**." (CRS Report for Congress, Document R42338, supra.) (Emphasis added.)

"Faithful adherence to the 'state action' requirement of the Fourteenth Amendment requires careful attention to the gravamen of the plaintiff's complaint." *Blum v. Yaretsky*, 457 U.S. 991, 1003 (1982).
"[T]he inquiry must be whether there is a sufficiently close nexus between the State and the challenged action of the regulated entity so that the action of the latter may be fairly treated as that of the State itself." *Jackson v. Metropolitan Edison Co.*, 419 U.S. 345, 351.

"Our cases have accordingly insisted that the conduct allegedly causing the deprivation of a federal right be fairly attributable to the State. These cases reflect a two-part approach to this question of 'fair attribution.' First, the deprivation must be caused by the exercise of some right or privilege created by the State or by a rule of conduct imposed by the State or by a person for whom the State is responsible. ... Second, the party charged with the deprivation must be a person who may fairly be said to be a state actor. This may be because he is a state official, because he has acted together with or has obtained significant aid from state officials, or because his conduct is otherwise chargeable to the State." *Lugar v. Edmondson Oil*, 457 U.S. 922 (1982).

In *Lugar v. Edmondson Oil*, 457 U.S. 922, 942 (1982), the Court stated:

> "[W]e have consistently held that a private party's joint participation with state officials in the seizure of disputed property is sufficient to characterize that party as a 'state actor' for purposes of the Fourteenth Amendment. The rule in these cases is the same as that articulated in *Adickes v. S. H. Kress & Co.*, supra, at 152, in the context of an equal protection deprivation:
>
> > "'Private persons, jointly engaged with state officials in the prohibited action, are acting "under color" of law for purposes of the statute. To act "under color" of law does not require that the accused be an officer of the State. It is enough that he is a willful participant in joint activity with the State or its agents,'" quoting *United States v. Price*, 383 U.S., at 794."

"[I]f the government coerces, influences, or encourages the performance of the act, it is state action." https://en.wikipedia.org/wiki/State_actor (See e.g., *Rendell-Baker v. Kohn*, 457 U.S. 830 (1982).)

"Relying on Flagg Brothers, Inc. v. Brooks, 436 U.S. 149 (1978); Jackson v. Metropolitan Edison Co., 419 U.S. 345 (1974); Moose Lodge No. 107 v. Irvis, 407 U.S. 163 (1972); and Adickes v. S. H. Kress Co., 398 U.S. 144 (1970), the Court held that, 'a State normally can be held responsible for a private decision only when it has exercised coercive power or has provided such significant encouragement, either overt or covert, that the choice must in law be deemed to be that of the State.'" Rendell-Baker v. Kohn, 457 U.S. 830, 839 (1982).

A state can be held liable for exercising coercive power or significantly encouraging, either overtly or covertly, a private party. *Blum v. Yaretsky*, 457 U.S. 991 at 1002-03 (1982).

"Not even the fact that the actions of the state agents are illegal under state law makes the action unattributable to the state for purposes of the Fourteenth Amendment."
https://www.law.cornell.edu/constitution-conan/amendment-14/section-1/state-action#fn1344amd14

"Misuse of power, possessed by virtue of state law and made possible only because the wrongdoer is clothed with the authority of state law, is action taken 'under color of' state law." *United States v. Classic*, 313 U.S. 299, 326 (1941).

"Actions of the state that are considered in any analysis should include passive as well as active state involvement. The essential ingredient in this respect is knowledge. If the state is cognizant of the challenged activity and chooses not to prevent it, then for all purposes encouragement of the activity is taking place." *The State Action Doctrine in State and Federal Courts*, Hala Ayoub, Florida State University Law Review, Vol. 11, 1984.

In a letter, dated January 16, 2018, and addressed to us, Sheila Ketterer, PPL Director of Advanced Metering & Data Operations, responding directly on behalf of Gregory Dudkin, President and Director of PPL Electric Utilities Corporation, stated: "**Pennsylvania Act 129**, passed into law in 2008, **requires electric utilities** with more than 100,000 customers **to provide those customers with advanced meters** that have specific capabilities. **PPL Electric Utilities ... is subject to this requirement. The specific language, found in Section 3 of the law, says utilities 'shall furnish' these meters. Act 129 does not include language allowing either customers or utilities to opt out of advanced meter installation.** As a result, we cannot honor customers' requests not to replace their meters." (Emphasis added.)

Ms. Ketterer, on behalf of Mr. Dudkin, thus has asserted that the actions of PPL in this matter are, and have been, **compelled** by the State.

As has been shown under Section II of this Complaint, "The Commission's Misconstruction of the Prevailing Legislative Intent of the Pennsylvania General Assembly," it is *not* the enactment of Pennsylvania's Act 129 by the state legislature which is responsible for the mandating of state-wide installation of wireless smart meters. Rather, it is the Pennsylvania Public Utility Commission which bears that responsibility with its no-opt-out implementation policy based entirely on its misconstruction of the explicitly-expressed legislative intent of the Pennsylvania General Assembly. (That explicitly-expressed legislative intent, which is on public record, was that smart meters were not mandated and would not be mandated.) By this means, the Commission has directly

insinuated its own interests and intent into the actions of the state's electric utility companies with regard to the mandatory installation of wireless smart meter devices and technology, which never have been studied or tested specifically for biological or adverse health effects and which the Commission and PPL Electric Utilities have forced upon customers and the public at large without their informed consent.

By virtue of PPL Electric's actions directly pursuant to the Pennsylvania Public Utility Commission policy and implementation **order mandating system-wide** installation of smart meters, the Company's "conduct has sufficiently received the imprimatur of the State so as to make it 'state' action for purposes of the Fourteenth Amendment." *Blum v. Yaretsky*, supra. See also *Flagg Bros., Inc. v. Brooks*, 436 U.S. 149 (1978); *Jackson v. Metropolitan Edison Co.*, supra; *Moose Lodge No. 107 v. Irvis*, 407 U.S. 163 (1972); *Adickes v. S. H. Kress & Co.*, 398 U.S. 144 (1970).

In a dissenting opinion on the divergence of the Court's analysis of 'state action' in *Jackson v. Metropolitan Edison* from that in *Burton v. Wilmington Parking Authority*, 365 U.S. 715, (1961), Justice Douglas wrote:

[Justice Douglas dissent - Begin quote]

> ... May a utility have complete immunity under federal law when the State allows its regulatory agency to become the prisoner of the utility or, by a listless attitude of no concern, to permit the utility to use its monopoly power in a lawless way?
> ...
> In Burton v. Wilmington Parking Authority, 365 U.S. 715 (1961), we said: "Only by sifting facts and weighing circumstances can the nonobvious involvement of the State in private conduct be attributed its true significance." Id., at 722. A particularized inquiry into the circumstances of each case is necessary in order to determine whether a given factual situation falls within "the variety of individual-state relationships which the [Fourteenth] Amendment was designed to embrace." Ibid. As our subsequent discussion in Burton made clear, the dispositive question in any state-action case is not whether any single fact or relationship presents a sufficient degree of state involvement, but rather whether the aggregate of all relevant factors compels a finding of state responsibility. 2 Id., at 722-726. See generally Moose Lodge No. 107 v. Irvis, 407 U.S. 163 (1972).
> ...
> It is not enough to examine seriatim each of the factors upon which a claimant relies and to dismiss each individually as being insufficient to support a finding of state action. It is the aggregate that is controlling.
> ...
> ... In the present case, however, respondent is not just one person among many; it is the only public utility furnishing electric power to the city. When power is denied a householder, the home, under modern conditions, is likely to become unlivable.
>
> Respondent's procedures for termination of service may never have been subjected to the same degree of state scrutiny and approval, whether explicit or implicit, that was present in Public Utilities Comm'n v. Pollak, 343 U.S. 451 (1952). Yet in the present case the State is heavily involved in respondent's termination procedures, getting into the approved tariff a requirement of "reasonable notice." Pennsylvania has undertaken to regulate numerous aspects of respondent's operations in some detail, 5 and a "hands-off" attitude of permissiveness or neutrality toward the operations in this case is at war

with the state agency's functions of supervision over respondent's conduct in the area of servicing householders, particularly where (as here) the State would presumably lend its weight and authority to facilitate the enforcement of respondent's published procedures. Cf. Adickes v. S. H. Kress & Co., 398 U.S. 144 (1970); Reitman v. Mulkey, 387 U.S. 369 (1967); Railway Employes' Dept. v. Hanson, 351 U.S. 225 (1956); Shelley v. Kraemer, 334 U.S. 1 (1948).

In the aggregate, these factors depict a monopolist providing essential public services as a licensee of the State and within a framework of extensive state supervision and control. The particular regulations at issue, promulgated by the monopolist, were authorized by state law and were made enforceable by the weight and authority of the State. Moreover, the State retains the power of oversight to review and amend the regulations if the public interest so requires. Respondent's actions are sufficiently intertwined with those of the State, and its termination-of-service provisions are sufficiently buttressed by state law to warrant a holding that respondent's actions in terminating this householder's service were "state action" for the purpose of giving federal jurisdiction over respondent under 42 U.S.C. 1983.

...

...

Section 1983 was designed to give citizens a federal forum 6 for civil rights complaints wherever, by direct or indirect actions, a State, acting "in cahoots" with a private group or through neglect or listless oversight, allows a private group to perpetrate an injury. The theory is that in those cozy situations, local politics and the pressure of economic overlords on subservient state agencies make recovery in state courts unlikely. ...

Section 1983 addresses itself to grievances inflicted "under color of any statute, ordinance, [or] regulation . . . of any State . . . ." The regulatory regime imposed by Pennsylvania on respondent utility seems to fit this statute like a glove. Electrical service, being a necessity of life under the circumstances of this case, is an entitlement which under our decisions may not be taken without the requirements of procedural due process. Fuentes v. Shevin, 407 U.S. 67, 80 (1972); Goldberg v. Kelly, 397 U.S. 254 (1970); Palmer v. Columbia Gas of Ohio, Inc., 479 F.2d 153 (CA6 1973).

...

2 The court below in Burton had relied heavily on a number of facts indicating minimal state involvement, but we regarded that court's analysis as unduly restricted in its scope: "While these factual considerations are indeed validly accountable aspects of the enterprise upon which the State has embarked, we cannot say that they lead inescapably to the conclusion that state action is not present. Their persuasiveness is diminished when evaluated in the context of other factors which must be acknowledged." 365 U.S., at 723. After discussing those additional factors in greater detail, we concluded: "Addition of all these activities, obligations and responsibilities of the Authority, the benefits mutually conferred, together with the obvious fact that the restaurant is operated as an integral part of a public building devoted to a public parking service, indicates that degree of state participation and involvement in discriminatory action which it was the design of the Fourteenth Amendment to condemn." Id., at 724.

...

5 The Public Utility Commission is given extensive control over utility rates, Pa. Stat. Ann., Tit. 66, 1141 et seq. (1959 and Supp. 1974-1975), and over the character and quality of utility services and facilities, 1171, 1182-1183; it is given broad power to receive and investigate complaints, 1391, 1398,

and to regulate and supervise the activities, rules, and contractual undertakings of utilities, 1171, 1341-1343, 1360.

6 There is no requirement for an exhaustion of state remedies before suing under 1983 (see Wilwording v. Swenson, 404 U.S. 249 (1971)), though suggestions for statutory changes in that regard have been made. Judd, The Expanding Jurisdiction of the Federal Courts, 60 A. B. A. J. 938, 941 (1974)."

[Justice Douglas dissent - End quote] (Jackson v. Metropolitan Edison Co., 419 U.S. 345 (1974).)

In *Braden v. University of Pittsburgh*, 552 F.2d 948, 956-58 (1977), the U.S. Court of Appeals for the Third Circuit held:

[Third Circuit opinion - Begin quote]

II. STATE ACTION.

... It is incumbent upon this Court to determine which, if either, of these cases Burton or Jackson may control the present situation and, in so doing, whether Jackson has superseded Burton as the preeminent declaration on state action with respect to circumstances such as we have here.

In Burton, the Court held that a private restaurant owner who refused service to a customer because of his race, violated the Fourteenth Amendment where the restaurant was located in a building owned by a state-created parking authority and leased from that authority. After a thorough review of the relationship between the restaurant and the authority, the Supreme Court concluded that the state had "so far insinuated itself into a position of interdependence with (the restaurant) that it must be recognized as a joint participant in the challenged activity, which, on that account, cannot be considered to have been so 'purely private' as to fall without the scope of the Fourteenth Amendment."[40] It is thus apparent that the dispositive factor in Burton, with respect to the state action issue, was the extent and nature of the overall relationship between the state agency and the private enterprise.

Decided thirteen years after Burton, Jackson concerned a different type of nongovernmental entity, namely, a privately owned and operated utility corporation. The utility was, however, subject to extensive state regulation in many particulars of its business. When the utility company terminated the electric service of a customer without notice, without a hearing, or without an opportunity to pay any amounts due, the customer charged that she had been denied due process. The Supreme Court rejected the due process claim on the ground that, since state action was not present, the utility was exempt from constitutional commands. It held that the Commonwealth of Pennsylvania was not sufficiently connected with the challenged termination to make the conduct of the private utility corporation attributable to the state for purposes of the Fourteenth Amendment.

Important to the inquiry here is the analytical formula set forth in Jackson respecting state action. For the Supreme Court stated there that, when considering the vexing state action issue, the "inquiry must

be whether there is a sufficiently close nexus between the state and the challenged action of the regulated entity so that the action of the latter may be fairly treated as that of the State itself."[41]

Appellants maintain that this "close nexus" test, rather than the "relationship" approach of Burton, should be applied in the case at bar. They contend that, for state action to exist, the Commonwealth must be closely involved with the challenged employment practices of the University. In so arguing, appellants imply that the vitality of Burton has been severely undermined by Jackson, and that the existence of a pervasive relationship between the Commonwealth and the University is not, standing alone, sufficient to undergird a ruling of state action.[42] While Jackson may invite some concern as to the present status of Burton, we do not find appellants' reading of these cases to be convincing. To the contrary, in our view, Burton retains viability, and so its teachings may well bear on the present inquiry.

Based on a review of the Supreme Court's opinion in Jackson, we believe that that decision would not preclude application of the precepts of Burton here, should the appropriate state-private relationship exist. Instead of overruling Burton, the Jackson Court merely distinguished the earlier opinion, finding "absent in (Jackson) the symbiotic relationship presented in Burton . . . ."[43] The implication arising from such efforts at differentiation is not that Burton was supplanted by Jackson, but rather that Burton remained as a powerful precedent with which the Court had to contend. Moreover, the Jackson opinion repeatedly cites Burton with apparent approval,[44] hardly sounding the death knell for Burton that the appellants would have us perceive.

It may be that only in the absence of an inextricably-linked relationship between the state and a private entity does the "close nexus" test of Jackson come into play. Where a private enterprise stands, in its operations, as a veritable partner with the state, then it seems proper to hold such enterprise subject to the same constitutional requirements to which the state is accountable. ... [A]s we understand it, Burton and Jackson stand as two models of state-action analysis that have been designed by the Supreme Court to date, with the applicability of either approach resting on the type of setting which may be present.[46]

... Indeed, the Supreme Court declared in Burton that "only by sifting facts and weighing circumstances . . ." can matters turning on state action be resolved.[47] And such emphasis on the factual elements was echoed in Jackson as well.[48]

...

Not only does it appear that the state in this situation, as in Burton, has "insinuated itself into a position of interdependence" with Pitt, but it seems to be a "joint participant" ... as well.

...

It should be observed that Jackson was decided immediately after the opinion in Isaacs was rendered. Since Isaacs so heavily relies, quite properly, on Burton, the analysis presented by Judge Higginbotham remains valid only so long as Jackson is not construed to overrule or devitalize Burton. As we fail to so read Jackson, the principles espoused in Isaacs remain supportive of the conclusion reached by the trial judge that state action cannot be ruled out summarily in the case at bar.

...

Having concluded that Burton retains vitality, we must examine the available materials concerning the nature and extent of the connection ... . Indeed, the Supreme Court declared in Burton that "only by

sifting facts and weighing circumstances . . ." can matters turning on state action be resolved.[47] And such emphasis on the factual elements was echoed in Jackson as well.[48]

...

40 365 U.S. at 725, 81 S. Ct. at 862
41 419 U.S. at 351, 95 S. Ct. at 453
42 See Brief for Appellants at 20-25
43 419 U.S. at 357, 95 S. Ct. at 457
44 See, e. g., id. at 350, 351, 95 S. Ct. 449

This Court has, on a number of previous occasions, indicated that Burton is very much a viable precedent. See, e. g., Broderick v. Associated Hospital Service of Philadelphia, 536 F.2d 1, 4 (3d Cir. 1976); Magill v. Avonworth Baseball Conference, 516 F.2d 1328, 1332 (3d Cir. 1975).

46 Moose Lodge No. 107 v. Irvis, 407 U.S. 163, 92 S. Ct. 1965, 32 L. Ed. 2d 627 (1972), though decided before Jackson, indicates that a bipartite approach to state action is the proper one. In declining to find state action in Moose Lodge, the Court seemingly invoked both the "close nexus" and "overall relationship" formulas:

However detailed this type of (private club) regulation may be in some particulars, it cannot be said to in any way foster or encourage (the) discrimination. Nor can it be said to make the State in any realistic sense a partner or even a joint venturer in the club's enterprise."

Id. at 176-77, 92 S. Ct. at 1973.

The Supreme Court has, of course, fashioned other analytical frameworks to deal with state action problems of a different complexion. See, e. g., Hudgens v. N.L.R.B., 424 U.S. 507, 96 S. Ct. 1029, 47 L. Ed. 2d 196 (1976); Evans v. Newton, 382 U.S. 296, 86 S. Ct. 486, 15 L. Ed. 2d 373 (1966); Marsh v. Alabama, 326 U.S. 501, 66 S. Ct. 276, 90 L. Ed. 265 (1946).

47 365 U.S. at 722, 81 S. Ct. at 860
48 419 U.S. at 351, 95 S. Ct. 449

[Third Circuit opinion - End quote]

"Utility service is a necessity of modern life; indeed, the discontinuance of water or heating for even short periods of time may threaten health and safety." (Memphis Light, Gas & Water Div. v. Craft, 436 U.S. 1 (1978).)

In its analysis following upon that in *Burton v. Wilmington*, the U.S. Court of Appeals for the Sixth Circuit, in *Palmer v. Columbia Gas of Ohio*, 479 F.2d 153 (1973), held:

[Sixth Circuit opinion - Begin quote]

STATE ACTION

...

... When a privately owned company enjoying a monopoly is in the business of providing a necessity of life it cannot, for purposes of evaluating its relationship to its customers and to the state in which and under whose control it operates, be considered as an independent, free market, common law competitor.

...
The parties are not upon equal ground. ... The consumer, once taken on to the system, becomes dependent on that system for a prime necessity of business, comfort, health, and even life.
...
Virtually every aspect of this company's operations are subject to the dictates of state statute or to the regulation15 of the Public Utilities Commission ... .
...
The important factor is not the number of statutes and regulations which pertain to the operation of a utility company, but the extent to which the state has reserved power to control the operations of a public utility, and the amount of power given to the utility which is usually reserved to the state.
...
[T]he state has granted to utilities powers not usually possessed by private corporations. ...

In addition, we must consider the fact that the furnishing of natural gas to the citizens ... is a legitimate public function which itself has been held to satisfy the state action requirement; when a public function is performed by a private firm whose freedom of decision making has been restricted by governmental regulation and whose freedom of action has been severely circumscribed, the actions of the otherwise private firm become subject to the constitutional limitations placed upon state action. ... When private individuals or groups are endowed by the state with functions or powers which are of a governmental nature, they become instrumentalities of the state and thus are subject to its constitutional limitations. Evans v. Newton, 382 U.S. 296, 299, 86 S.Ct. 486, 15 L.Ed.2d 373 (1966).

In summary, inasmuch as the operations of the appellant company are fully circumscribed by an all-encompassing system of state statutes ... and the supervision of the state regulatory authority, and inasmuch as the state ... is significantly involved in virtually every one of the company's activities, including the specific activity complained of, the conclusion that the regulatory activities of the state have insinuated it into a position of interdependence with the company so that it must be recognized as a joint participant with the company is inescapable. Burton, supra, 365 U.S. at 725, 81 S.Ct. 856.

[Sixth Circuit opinion - End quote]

Regardless of which line of analysis is followed pursuant to the *State Action Doctrine*, either that deriving from *Burton*, or that applied in *Jackson*, it is clear that the Commission's policy of mandatory installation of AMI wireless smart meters is such that, in addition to willful acquiescence, there absolutely does exist sufficient involvement, influence, knowledge, and sanctioning by the Commission in the conduct engaged in by PPL Electric Utilities against the Complainants and the citizens of this Commonwealth to establish that the PPL Electric has acted and is acting, along with the Commission, under color of law as an agent of the State and is thereby a 'state actor'.

(END ATTACHMENT)

ATTACHMENT II

SELECT QUOTATIONS

of the PA Commonwealth Court
in *Povacz, et al. v. Pennsylvania Public Utility Commission*
241 A.3d 481 (Pa. Cmwlth. 2020)

The PA Supreme Court's Aug. 2022 (*'Povacz II'*) ruling on this issue notwithstanding, the PA Commonwealth Court, by its careful analysis and more thorough scrutiny of the language of Act 129, soundly repudiated the Pennsylvania Public Utility Commission's policy of mandating smart meters pursuant to the Commission's incorrect interpretation of the legislative intent of the Pennsylvania General Assembly as set forth under Act 129.

> "Act 129 mandates that an electric distribution company, such as PECO, 'shall furnish smart meter technology . . . in accordance with a depreciation schedule not to exceed 15 years.' 66 Pa.C.S. §2807(f)(2)(iii). However, **nothing in the statutory language affirmatively mandates that customers must allow installation of wireless smart meters**." (Emphasis and underlining added.)
>
> "To 'furnish' means 'to provide with what is needed; . . . supply, give.' Webster's Ninth New Collegiate Dictionary 499 (1985). The definition does not imply that the recipient is forced to accept that which is offered. Therefore, we find the PUC is incorrect in concluding that Act 129 facially precludes any customer refusal of installation of smart meters.
> "Act 129 requires an electric distribution company to 'furnish smart meter technology,' 66 Pa.C.S. § 2807(f)(2)(iii), but does not require every customer to avail himself of every aspect of that technology. Notably, several provisions of Act 129 seem to contemplate customer choice in the degree to which the smart meter technology is used."
> ...
> "In addition, as Consumers correctly argue, Act 129's definition of 'smart meter technology' leaves the door open for accommodations of customer requests to avoid RF emissions from smart meters."
> ...
> "[A]lthough Act 129 does appear to anticipate installation of smart meters on customers' premises, **nothing in the language of Act 129 facially *requires* every customer to endure involuntary exposure to RF emissions from a smart meter**. Rather, the language of Act 129 seems calculated to support customer ***choice*** in the use of smart meter technology. Therefore, we conclude that Act 129 does not preclude either PECO or the PUC from accommodating a customer's request to have RF emissions from that customer's meter turned off, ... or some other reasonable accommodation. We reverse that portion of the PUC's decisions finding it lacked authority for accommodations of customers' requests to avoid RF emissions. We remand to the PUC to allow consideration of Consumers' requests for accommodations ... ." (Emphasis and underlining added.)
> ...
> "[T]he PUC's position that Act 129 requires installation of wireless smart meters in all consumer residences is incorrect. Accordingly, the PUC is also incorrect in finding that PECO may not or need not offer any accommodation to Consumers.

"Because this portion of the PUC's decision is dependent on its erroneous conclusion that Act 129 does not allow accommodations, we vacate this portion of the PUC's decision and remand for further consideration."

...

"[I]n considering accommodations to Consumers on remand, the PUC should consider whether accommodations are appropriate ***without*** proof of harm, so that Consumers may choose to avoid RF emissions from wireless smart meters ... ."

...

"... [T]he PUC appears to have based its decision largely on its conclusion that Act 129 mandated installation of wireless smart meters on every residence and did not permit the PUC to grant ***any*** form of relief to Consumers to accommodate their desire to avoid RF emissions. On remand, the PUC should consider whether reasonable accommodations should be provided in light of the conclusion that Act 129 does not preclude such accommodations of customers' health concerns, regardless of proof of harm."

...

"... We reverse the PUC's conclusion that it lacks authority to accommodate Consumers' desire to avoid RF emissions from smart meters and vacate the PUC's determination that such accommodation would not be reasonable. ... **On remand, the PUC should consider all reasonable accommodations, including, but not limited to, deactivation of the RF emitting functions of the smart meters; ... and installation of wired rather than wireless smart meters, if (as Consumers contend) such technology is available**." (Emphasis and underlining added.)

(END ATTACHMENT II)

ATTACHMENT III

TESTIMONIES GIVEN BY EMINENT SCIENTIFIC AND PUBLIC HEALTH EXPERTS ON MATTERS CONCERNING SMART METER SAFETY

These documents are public documents on file with the FCC. They originally were filed under Maine PUC Docket No. 2011-00262. A number of them are among the exhibits in the Complainants' Amended Complaint.

Close reading of these documents would make it abundantly clear to any rational, reasonable person that existing scientific and medical evidence has shown it to be incontrovertibly the case and beyond reasonable doubt that RF radiation and electromagnetic fields (EMFs) produced by smart meters at levels below the current, long-outdated, FCC safety guidelines can, and do, cause adverse biological effects and pose very real and substantial risks to public health and safety.

https://www.fcc.gov/ecfs/document/6017465448/1	Testimony of Dr. Lennart Hardell, MD, PhD	(EXH. 1C)
https://www.fcc.gov/ecfs/document/6017465448/3	Testimony of Dr. De-Kun Li, MD, PhD, MPH	(EXH. 1F)
https://www.fcc.gov/ecfs/document/6017465448/2	Testimony of Dr. Dariusz Leszczynski, PhD, DSc	(EXH. 1E)
https://www.fcc.gov/ecfs/document/6017465449/1	Testimony of Dr. David O. Carpenter, MD	
https://www.fcc.gov/ecfs/document/6017465450/2	Testimony of Dr. Jerry L. Phillips, PhD	(EXH. 1D)
https://www.fcc.gov/ecfs/document/6017465450/1	Testimony of Lloyd Morgan, BSEE	(EXH. 1H)
https://www.fcc.gov/ecfs/document/6017339058/2	Testimony of Dr. William J. Rea, MD	
https://www.fcc.gov/ecfs/document/6017465452/1	Testimony of Girish Kumar, BSc, PhD	
https://www.fcc.gov/ecfs/document/6017465453/2	Testimony of Dr. Richard H. Conrad, PhD	(EXH. 1G)
https://www.fcc.gov/ecfs/document/6017465453/1	Testimony of Joshua Hart, MSc	

To be sure, on August 13, 2021 the U.S. Circuit Court of Appeals for the District of Columbia ruled the FCC ignored scientific evidence and failed to provide a reasoned explanation for its determination that its 1996 guidelines adequately protect the public against all the harmful effects of wireless radiation. (https://docs.fcc.gov/public/attachments/DOC-374936A1.pdf)

In that ruling, the Court stated:

> [Begin quote]
>
> In the Department of the Interior's expert view, the Commission's RF radiation limits "continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today." J.A. 8,383. **"The [current environmental] problem," according to the Department of the Interior, "appears to focus on**

> **very low-level, non-thermal electromagnetic radiation."** *Id.* Although the Commission has repeatedly claimed that it considered "inputs from [its] sister federal agencies[,]" *2019 Order*, 34 FCC Rcd. at 11,689, the Commission entirely failed to address the environmental harm concerns raised by the Department of the Interior. (Emphasis added.)

[End quote]

"FCC limits are based on the outdated belief that heating is the only proven harm from RF. Over 11,000 pages of evidence - 447 exhibits in 27 Volumes - was submitted to the Court documenting biological effects and illness from wireless radiation exposure at non-heating levels. Research has found brain damage, headaches, memory problems, reproduction damage, synergistic effects, nervous system impacts, brain cancer, genetic damage, as well as harm to trees, birds, bees, and wildlife." (*Environmental Health Trust, et al. v. FCC* Factsheet)

The Court found that the FCC did not provide evidence of properly examining record evidence indicating non-cancer harm such as

impacts to children
testimony of persons injured bywireless radiation
impacts to the developing brain
impacts to the reproductivesystem
impacts to wildlife and theenvironment

(END ATTACHMENT III)

Before the Commissioner of the of the State of

In the Matter of the Alleged Unlawful Housing Practice Based upon Disability	)	**Conciliation Agreement**
and Complainant(s)	)	Case Number
v.	)	
Mayor City Council City Manager City of Councilor City Council Councilor City Council Councilor City Council Councilor City Council Councilor City Council President City Council Respondent(s)	)	HUD Case Number

In accordance with the provisions of Chapter Revised Statutes and Administrative Rules et seq.; the Civil Rights Division, and the City of agree to enter into this Conciliation Agreement in full settlement of the complaint filed with the Civil Rights Division, filed on 2013, HUD Case Number wherein and appear as the Complainants and , and appear as the Respondents. It is understood and agreed that this agreement is not construed as an admission of liability on the part of Respondents but is a compromise of a disputed claim. With an authorized representative for Respondent signature, all other Respondent parties are released and this matter settled. It is hereby agreed:

I. GENERAL PROVISIONS

A. PARTIES AND SUBJECT PROPERTY

1. The Complainants referenced herein are and . Respondents to the filed and complaint, Title VIII Case Number , are . The subject property is

2. This agreement to be signed by City Manager for the City of and the parties agree that it releases all other Respondents.

B. STATEMENT OF FACTS

3. A complaint was filed on 2013, with the United States Department of Housing and Urban Development (the Department) alleging that Complainant Complainants were injured by a discriminatory act of the Respondents. Complainants allege that Respondents violated Section 804(b) or (f) of Title VIII of the Civil Rights Act of 1968 as amended in 1988, 42 U.S.C. 3601 et seq. (the Act) on the basis of disability by discriminatory terms, condition, privileges, or services and facilities and failure to make a reasonable accommodation. That complaint was co-filed with under

4. Respondents deny having discriminated against Complainants, but agree to settle the claims in the underlying action by entering into this Conciliation Agreement. It is understood that this Conciliation Agreement does not constitute an admission by the Respondents of any violation of the Act, or any other law.

C. EFFECTIVE DATE

5. The parties expressly agree that this Agreement constitutes neither a binding contract under state or federal law nor a Conciliation Agreement pursuant to the Act, unless and until such time as it is approved by the , through the Civil Rights Division / his or her designee.

6. This Agreement shall become effective on the date on which it is approved by the Civil Rights Division .

D. GENERAL PROVISIONS

7. The parties acknowledge that this Agreement is a voluntary and full settlement of the disputed complaint. The parties affirm that they have read and fully understand the terms set forth herein. No party has been coerced, intimidated, threatened or in any way forced to become a party to this Agreement.

8. Respondents acknowledge that they have an affirmative duty not to discriminate under the Fair Housing Act and Chapter and that it is unlawful to retaliate against any person because that person has made a complaint, testified, assisted or participated in any manner in a proceeding under the Act or Chapter Respondents further acknowledge that any subsequent retaliation or discrimination constitutes both a material breach of this Agreement, and a statutory violation of the Act.

9. This Agreement, after it has been approved by is binding upon Respondents, their employees, heirs, successors and assigns and all others in active concert with them in the ownership or operation of the subject property.

10. It is understood that, pursuant to ., upon approval of this agreement by , it is a

11. This Agreement does not in any way limit or restrict the Department's or authority to investigate any other complaint involving Respondents made pursuant to the Fair Housing Act or . apter , or any other complaint within the Department's or jurisdiction.

12. No amendment to, modification of, or waiver of any provisions of this Agreement shall be effective unless: (a) all signatories or their successors to the Agreement agree in writing to the amendment, modification or waiver; (b) the amendment, modification or waiver is in writing; and (c) the amendment, modification or waiver is approved and signed by the Civil Rights Division

13. The parties agree that the execution of the Agreement may be accomplished by separate execution of consents to this Agreement, and that the original executed signature pages attached to the body of the Agreement constitute one document.

14. Complainant hereby forever waives, releases, and covenants not to sue the Department, . or Respondents, their heirs, executors, assigns, agents, employees and attorneys with regard to any and all claims, damages and injuries of whatever nature, whether presently known or unknown, arising out of the subject matter of Case Number and HUD Case Number ' or which could have been filed in any action or suit arising from said subject matter.

15. Complainant agrees that this Conciliation Agreement constitutes a withdrawal of HUD Case Number This release does not apply to other complaints or matters of compliance which may be pending with . or the Department.

16. Respondents hereby forever waive, release, and covenant not to sue the Department, or Complainant, their successors, assigns, agents, officers, board members, employees and attorneys with regard to any and all claims, damages and injuries of whatever nature, whether presently known or unknown, arising out of the subject matter of ' Case Number . and HUD Case Number or which could have been filed in any action or suit arising from said subject matter.

II. RELIEF FOR COMPLAINANT

17. Respondents will switch the water meter at the subject property to a manual water meter (a non-electromagnetic field meter) within two weeks of the date upon which this Agreement is signed by all parties and becomes effective.

18. If Complainants move from the subject property to another property within the area over which Respondents have jurisdiction, Respondents will switch the water meter at the new property to a manual water meter. If Complainants have already moved into the new property at the time the request is made, Respondents will switch the water meter to a manual meter within two weeks of the date the request is made. If Complainant's have not moved into the new property at the time the request is made, Respondents will switch the water meter to manual meter before Complainants move to the new property provided that at least two weeks notice is given.

19. Respondents will contact Complainants' neighbors at the three adjacent properties to notify them that there is a request that the water meters at their homes be switched to manual meters. Respondents will make this request to the three adjacent neighbors in a way that it does not identify Complainants as the persons making the request or refer to Complainant's disabling condition(s). Respondents will switch the water meters at the three adjacent properties to a manual water meters within two weeks of the date upon which it learns that the neighbors do not object. Respondents and Complainants recognize that a situation may result in which one or more neighbors do object, in which case those particular water meters will not be changed.

20. Respondents will not charge any fees or costs to Complainants for switching the meters to manual meters or for reading the manual meters.

III. ACTIONS IN THE PUBLIC INTEREST

21. Respondents acknowledge that the Fair Housing Act and Chapter prohibit discrimination against individuals on the basis of disability. Respondents further acknowledge that these laws provide protection against being excluded from the participation in, or being denied the benefits of, equal housing opportunities or programs solely on the basis of disability.

22. Respondents agree to make reasonable accommodations in rules, policies, practices, or services, when such accommodations may be necessary to afford a disabled person equal opportunity to use and enjoy a dwelling or housing program.

IV. MONITORING

23. The Department and shall determine compliance with the terms of this Agreement. During the term of this Agreement, HUD an . may review compliance with this Agreement. As part of such review, HUD and . may inspect Respondent's property identified in Section A of this Agreement, examine witnesses and copy pertinent records of Respondents. Respondents agree to provide

full cooperation in any monitoring review undertaken by HUD or [illegible] ensure compliance with this Agreement.

V. CONSEQUENCES OF BREACH

24. Whenever the Department has reasonable cause to believe that Respondents have breached this Agreement, the matter may be referred to the Attorney General of the United States, to commence a civil action in the appropriate U.S. District Court, pursuant to §§810(c) and 814(b)(2) of the Act.

VII. DECLARATIONS

25. By approval of this agreement and upon compliance with the terms of this agreement, Complainant declares and represents full understanding of the terms of this Conciliation Agreement and voluntarily accepts the aforesaid terms for the purpose of making a full compromise and settlement of the complaint named above.

26. By approval of this . Civil Rights Division, declares and represents that it will accept this settlement for the purpose of making a full compromise, adjustment, and settlement of any and all claims of, or in any way arising out of, the filing of the above-named complaint. The Division may, however, investigate any alleged breach of this agreement

By: Date: 4-1-2014

Complainant

By: Date: 4- 2014

Complainant

By: _____ Date: _____

Respondent

APPROVED:

By: _____ Date: 5/ /14

Civil Rights Division

By: _____ Date: 5/ /14

Senior Investigator

Civil Rights [illegible]

full cooperation in any monitoring review undertaken by HUD or to ensure compliance with this Agreement.

V. CONSEQUENCES OF BREACH

24. Whenever the Department has reasonable cause to believe that Respondents have breached this Agreement, the matter may be referred to the Attorney General of the United States, to commence a civil action in the appropriate U.S. District Court, pursuant to §§810(c) and 814(b)(2) of the Act.

VII. DECLARATIONS

25. By approval of this agreement and upon compliance with the terms of this agreement, Complainant declares and represents full understanding of the terms of this Conciliation Agreement and voluntarily accepts the aforesaid terms for the purpose of making a full compromise and settlement of the complaint named above.

26. By approval of this Civil Rights Division, declares and represents that it will accept this settlement for the purpose of making a full compromise, adjustment, and settlement of any and all claims of, or in any way arising out of, the filing of the above-named complaint. The Division may, however, investigate any alleged breach of this agreement

By: _____ Date: _____

Complainant

By: _____ Date: _____

Complainant

By: Date: 5/ /14

Respondent

APPROVED:

By: _____ Date: _____

By: _____ Date: _____

Evidence of Harm Files
EHT et al v. FCC

The United States Court of Appeals for the District of Columbia Circuit (Docket No. 20-1025) ruled on August 13,2021 that the FCC failed to respond to the following 26 volumes of evidence of harm, long term wireless exposure, impacts to children, testimony of people injured by wireless, impacts to the wildlife and the environment and to the developing brain and reproduction. The research studies in the volumes below were generally posted as abstracts, not the full articles. Comments filed by people who have been disabled by radiation sickness are included in volumes 22-25. Few Pennsylvanians are included in those volumes because Pennsylvanians for Safe Technology was involved in an advocacy project and was unable to participate in this. Evidence of harm in Pennsylvania is well documented in the numerous PUC cases some of which are now in the Commonwealth Court and Supreme Courts. Furthermore, we did not see the 6100 US Navy Studies showing harm listed (Naval Medical Research Institute and Naval MRI Glaser Report). We have a total of at least 7991 studies showing the harm of radiofrequency and microwave radiation on our website, www.pasafetech.org. The ruling in this case can be found on our website at https://pasafetech.org/legal-files - please scroll down to Federal Court Files, 2021-0813-DC-Circuit-Case-20-1025-Judgment.)

VOL 2 Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017, Part 1)
VOL 3 Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017, Part 2)
VOL 4 Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017, Part 3)
VOL 5 Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017, Part 4)
Joel Moskowitz PhD's research files of Harm
VOL 6 Joel Moskowitz PhD's newer files of harm [600], Garg C Vesperman [15], E. H. Trust files
VOL 7 Exposure Limits; Environment: Birds, Bees, Nature; Parents for Safe Technology, IARC
VOL 8 Cancer; BioInitiative Report
VOL 9 Autism, Cancer, Neurological
VOL 10 Harm, DNA, Oxidative Stress
VOL 11 Biological effects, Low-Intensity effects
VOL 12 Neurological, behavioral, Radiation Sickness, health effects
VOL 13 Environmental Working Group and other group appeals
VOL 14 Reproduction, Developmental & Other Harm
VOL 15 Children & Adolescent Harm
VOL 16 Children, Harm, Radiation Sickness
VOL 17 General Evidence of Harm, Wireless Utility Meters
VOL 18 Brain, Cancer
VOL 19 Children, Cancer, General Harm
VOL 20 Industry Influence and Harm
VOL 21 Exposure Standards/Radiation Sickness
VOL 22 Radiation Sickness
VOL 23 Radiation Sickness
VOL 24 Radiation Sickness Comments - Continued
VOL 25 Radiation Sickness, Individual Rights Comments
VOL 26 Individual Rights/Precautionary Principal Comments, Professor Claudia Roda (Impacts of digital technology on human behavior and social structure), Wi-Fi – Children – Dr. Ronald E. Koetzsch, PhD.
VOL 27 SUPPLEMENT Exposure Limits: The underestimation of absorbed cell phone radiation, especially in children, University of Utah, Salt Lake City; Cautionary Policy on Radio frequency Radiation Actions by Governments, Health Authorities and Schools Worldwide

VOLUME 2 Part 1: Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017)
https://tinyurl.com/Evidence-Volume-2
3 p.589-764 Sep. 16, 2019 Joel M. Moskowitz PhD Research Compilation; Abstracts of over 2,100 studies published between1990 - 2017; Prof. Henry Lai. (Tab 7 Part 1)

VOLUME 3 Part 2: Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017)
https://tinyurl.com/Evidence-Vol-3
4 p.765-1164 Sep. 16,2019Joel M. Moskowitz PhD Research Compilation; Abstracts of over 2,100 studies published between 1990 - 2017; Prof. Henry Lai. (Tab 7 Part 2)

VOLUME 4 Part 3 Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017)
https://tinyurl.com/Evidence-Volume-4
5 p.1165-1564 Sep. 16, 2019 Joel M. Moskowitz PhD Research Compilation; Abstracts of over 2,100 studies published between 1990 - 2017; Prof. Henry Lai. (Tab 7 Part 3)

VOLUME 5 Professors' Henri Lai and Joel Moskowitz's research files – Evidence of Harm

https://tinyurl.com/Evidence-Volume-5

Part 4: Professor Henry Lai's files of Harm (over 2100 studies between 1990-2017)

6 p.1565-1602 Sep. 16, 2019 Joel M. Moskowitz PhD Research Compilation; Abstracts of over 2,100 studies published between 1990 - 2017; Prof. Henry Lai. (Tab 7 Part 4)

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VOLUME 6 Professor Joel Moskowitz's newer files of harm [600], Garg C Vesperman [15], E. H. Trust files

https://tinyurl.com/Evidence-Volume-6

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VOLUME 8 Cancer; BioInitiative Report

https://tinyurl.com/Evidence-Volume-8

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VOLUME 9 Autism, Cancer, Neurological

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VOLUME 13 Environmental Working Group and other group appeals

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VOLUME 14 Reproduction, Developmental & Other Harm

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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementing the Infrastructure Investment and Jobs Act: Prevention and Elimination of Digital Discrimination	)	GN Docket No. 22-69

COMMENTS OF ADVOCATES FOR THE EMS DISABLED
IN RESPONSE TO NOTICE OF INQUIRY

Children's Health Defense, Susan Foster, Medical Writer, Fire & Utility Consultant; Odette J. Wilkens, President & General Counsel, Wired Broadband, Inc.; Frank Clegg, (formerly, President of Microsoft Canada), Canadians for Safe Technology; Arizonans for Safe Technology; 5G Free California; Desiree Jaworski, Executive Director, Center for Safer Wireless; Kent Chamberlin, PhD, Former member of the NH Commission to Study The Environmental and Health Effects of Evolving 5G Technology; Californians for Safe Technology; Coloradans for Safe Technology; Larry Ortega, Community Union, Inc.; Paska Nayden, Connecticut for Responsible Technology; Cynthia Franklin, Director, Consumers for Safe Cell Phones; Ms. Antonella DiSaverio; Ms. Eva Bortnick; Families for Safe Technology.org; Howard Goodman, Esq.; Safe Technology Minnesota; Ms. Karol Kuehn; Keep Cell Towers Away, Elk Grove, CA; 5G Free Rhode Island; The Leto Foundation; Maine Coalition to Stop Smart Meters; Mrs. Marie Molnar; Mr. Andrew Molnar; Napa Neighborhood For Safe Technology; MA for Safe Technology; Mrs. Pamela Wallace, Director, Safe Tech Forward Michigan; New Hampshire for Safe Technology; New Yorkers 4 Wired Tech; Oregon for Safe Technology; Eugene J. Bazan, PhD, Secretary, PA Smart Meter Work Group; Pennsylvanians for Safe Technology; Stephen R Dahl, Director, Rhode Islanders for Safe Technology; Safe Tech International, Safe Tech 4 Santa Rosa; Virginians for Safe Technology;

Toxics Information Project; Ms. Anne Wilder, Priest River, Idaho; Ms. Donna Romo; Mark Wahl, Director, Citizen League Encouraging Awareness of Radiation of Whidbey Island, WA; Manhattan Neighbors for Safer Telecommunication; ElectromagneticHealth.org; Lendri Purcell, Founder, Families Advocating for Chemical and Toxics Safety; Ms. Linda Dance; Lex Kisteneff, CEO & Founder, The South Carolina Coalition for Wireless Safety Standards s; mocoSafeG.org in Montgomery County, MD; and Last Tree Laws (hereafter "Advocates for the EMS Disabled") submit these comments in response to the Notice of Inquiry[1] in the above-captioned proceeding.

Introduction and Summary

Advocates for the EMS Disabled applaud the Commission's initial effort to "ensure equal access to high-quality, affordable broadband internet access service." We also fully support the emphasis on "harms experienced by historically excluded and marginalized communities" and the desire for "meaningful policy reforms and systems improvements, as well as a framework for collaborative action to extend digital opportunity to everyone." NOI ¶1.

The Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, 135 Stat. 429 (2021) ("Infrastructure Act")[2] seeks to "prevent and eliminate digital discrimination" "based on income level, race, ethnicity, color, religion, or national origin." 47 U.S.C. §1754(b)(1). It demands "equal access" to "broadband services," *e.g.*, "the equal opportunity to subscribe to an offered service that provides comparable speeds, capacities, latency, and other quality of service metrics in a given area, for comparable terms and conditions." §1754(a)(1)-(3). As noted in NOI §6 the Infrastructure Act supplemented the Commission's pre-existing authority to ensure nondiscriminatory universal service for common carrier service and extended many of the same

[1] Notice of Inquiry, *Implementing the Infrastructure Investment and Jobs Act: Prevention and Elimination of Digital Discrimination*, FCC 22-21, GN Docket No. 22-69 (Mar. 2022) ("*FCC DEI NOI*").

[2] Section 60506 of the Infrastructure Act is codified at 47 U.S.C. §1754, *Digital Discrimination*.

principles to broadband internet access service, which is part of "advanced telecommunications capability" but currently classified as a non-common carrier information service under the Commission's current rules.

Advocates for the EMS Disabled also support the Commission's enunciated goals to advance "equity in the provision of and access to digital communication services and products for all people of the United States, without discrimination on the basis of race, color, religion, national origin, sex, or disability." NOI ¶7 (emphasis added). Although §1754(b)(1) does not expressly include the disabled community within its coverage, the general "equal access" to "all people" requirements in §1754(a)(2) and (3) implicitly do. Therefore, the Commission should conclude that the "listed characteristics in section 60506(b)(1)" are ***not*** "exclusive (NOI ¶24) and disability status is a protected "characteristic" for purposes of the Infrastructure Act. This interpretation would be fully consistent with existing Commission authority, Executive Order 13985 (Jan. 20, 2021) and the Commission's Equity Action Plan responding to Executive Order 13985, which expressly recognizes that "persons with disabilities" "disproportionately lack access to broadband internet service."

Even if the Infrastructure Act's listed "characteristics" are fairly viewed as exclusive, the Commission has other general and specific authority to ensure the disabled do not suffer digital discrimination and have equal access to broadband:

- Section 152(18) incorporates the Americans with Disabilities Act definition (42 U.S.C. §12102).
- Section 225 contains special authority for the speech and hearing impaired.
- Section 255 requires that telecommunications equipment, customer premises equipment and telecommunications services be "accessible to and usable by individuals with disabilities" or at least be "compatible with peripheral devices or specialized customer premises equipment commonly used by individuals with disabilities."

- Section 256 allows the Commission to participate in standards setting activities that "promote access to" "network capabilities and services by individuals with disabilities."
- Section 1302(a) encourages "deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans."
- The FCC is subject to Rehabilitation Act Section 504, 29 U.S.C. §794, and this proceeding along with any rules or policy determinations will be made as part of a "program or activity" as defined in §1.803 of the Commission's rules. If the rules or policy determinations impact federal assistance the recipients will also be covered by Section 504's nondiscrimination and access requirements relating to the disabled.
- There are many other codified and non-codified provisions addressing disabled access, universal service and nondiscrimination scattered throughout the Communications Act including, of course, the general and overarching purposes and policies stated in 47 U.S.C. §151.

These comments will make two principal points, one general and the other specific.

First, the Commission must continue to recognize that wireless-based services do not now and likely never will "provide[] comparable speeds, capacities, latency, and other quality of service metrics in a given area, for comparable terms and conditions" (§1754(a)(2)) in comparison to fiber to the premises. Wireless may constitute "advanced telecommunications capability" but it is still a *complement to*, not an adequate substitute for fiber-fed service. A wireless based user will not receive the same speed, capacity, latency or quality of service and the terms and conditions are not comparable to those for wired (fiber) based access. This is especially so for mobile services, but even fixed wireless solutions are inferior to direct fiber-fed service to the premises. The Commission should always prioritize "to the premise" fiber solutions and rely on wireless only when wired is technically or economically infeasible or the main purpose is mobility.

Second, the disability community is diverse. There are many kinds of disabilities due to a host of causes and each kind gives rise to different needs. There is, however, a much-ignored but large and growing part of the disability community that has been specially harmed and suffers

unique digital discrimination: those who cannot be around Radio Frequency Radiation (RF) because it makes them sick or sicker. Some estimates indicate that up to *thirty percent* of the population – almost *40 million* people – suffer at least mild symptoms after exposure to RF.[3] Five percent (5%) – around 17 million – suffer moderate symptoms. One and a half percent (1.5%), or almost **5 million** people suffer "severe symptoms" and 0.65% (2.16 million) are so disabled they cannot work at all. Those with "severe symptoms" have "physical or mental impairment[s] that substantially limit[] one or more major life activities." 42 U.S.C. §12102(1)(A). They are the "EMS Disabled" community on behalf of whom these comments are filed. Wireless exposure is the direct cause of or a major contributing factor to the impairment. This technology is making millions of Americans sick, and it is past time that this pan-epidemic[4] be recognized and addressed.

Forcing exposure – even as part of a genuine and kind-hearted effort to afford broadband access – is itself a form of discrimination as a matter of law. More important it is fundamentally inequitable because it leads to great harm. Those with severe symptoms are functionally excluded from public participation since almost all public spaces are flooded with RF – a toxin to them. Those with wireless facilities nearby cannot even take refuge in their own homes; they are driven out and consigned to a more miserable and sometimes hostile and threatening environment.

If the Commission is sincere about achieving "diversity, equity and inclusion" it ***must*** recognize this specific problem and take the kind of special measures to address it that are within its regulatory remit. There must be an allowance for RF-free "safe zones" in public spaces and

[3] The Prevalence of People with Restricted Access to Work in Manmade Electromagnetic Environments, https://mdsafetech.files.wordpress.com/2019/10/2018-prevalence-of-electromagnetic-sensitivity.pdf.

[4] "Scientists 5G appeal," available at http://www.5gappeal.eu/the-5g-appeal/.

buildings to ensure inclusion in public life. The Commission can and should establish such zones, or at least allow local and state authorities to do so without threat or fear of litigation on preemption grounds. The attached paper by Susan Foster and Odette J. Wilkins, "Eliminating Digital Discrimination for the EMS Disabled" provides even more suggestions.

Those who cannot be around RF must have the ability, as a matter of right, to obtain wired (fiber-based) broadband; otherwise they will functionally be denied access to any broadband at all. The RF-sensitive community in general and especially the EMS disabled community in particular must be allowed equal access to broadband in a form that does not threaten or worsen their health and well-being.

I. WIRED (FIBER-BASED) BROADBAND SHOULD BE THE PREFERRED MODE OF BROADBAND ACCESS DELIVERY

The Commission must continue to recognize that wireless-based services do not now and likely will never "provide[] comparable speeds, capacities, latency, and other quality of service metrics in a given area, for comparable terms and conditions" (§1754(a)(2)) in comparison to "fiber to the premises" ("FTTP," also known as "fiber to the home" or "FTTH") Wireless may constitute "advanced telecommunications capability"[5] but it is still a *complement to*, not an adequate substitute for fixed service[6] and especially FTTH. A wireless based user will not receive the same speed, capacity, latency or quality of service and the terms and conditions are not comparable to those for wired (fiber) based access. This is especially so for mobile services,

[5] 47 U.S.C. § 1302(d)(1).

[6] *See, In re Inquiry Concerning Deployment of ATC to All Americans*, FCC 20-50, ¶¶10-12, 35 FCC Rcd 8986, 8991 (Apr. 2020) ("*Fourteenth Broadband Competition Report*") ("…fixed broadband generally delivers faster speeds, permits higher consumption at a lower price, and has far higher data caps,…While users may substitute between mobile and fixed broadband when accessing certain services and applications, the record indicates that they are not yet functional substitutes for all uses and customer groups. Based on the record before us, we again find that fixed broadband and mobile wireless broadband services are not functional substitutes in all cases.") (notes omitted).

but even fixed wireless solutions are inferior to direct fiber-fed service to the premises. The Commission should always prioritize "to the premise" fiber solutions and rely on wireless only when wired is technically or economically infeasible or the main purpose is mobility.

1. Fiber to the premise offers higher speeds, better reliability, is more secure and costs less.

FTTP is far superior to all other network architectures, including "fiber to the node" with the last link serviced through copper, coaxial or a wireless link. FTTP offers fully symmetrical multi-gigabit service, less opportunity for congestion because of backhaul limits, better reliability in the face of bad weather, no chance of signal obstruction by vegetation or buildings and lower aesthetic impacts that contribute to visual blight. It is more secure and presents lower risks from electrical fires. FTTP has lower energy needs in relation to wireless, so it has less environmental impact, as explained below. The fiber itself has almost infinite capacity;[7] it is limited only by the capabilities of the equipment at each end. Fiber is futureproof.[8]

Although FTTP does require a physical, tangible link all the way to the premise and often involves higher front-end capital costs and longer construction time, FTTP is far better over the long run. For example, the Total Cost of Ownership (TCO) is far less than the cost of Fixed Wireless Access over the long run. Operations, maintenance and replacement/upgrade costs are lower. The facilities themselves last for a very long time. Some periodic end-link equipment

[7] Researchers in the Netherlands were able to transmit 255 terabits per second down a single strand in 2014. 255 Terabits/s: Researchers demonstrate record data transmission over new type of fiber, Eindhoven University of Technology (Oct. 27, 2014). A single fiber could, in theory, carry all the world's traffic. 255Tbps: World's fastest network could carry all of the internet's traffic on a single fiber, Telepresence Options (Oct. 29, 2014).

[8] Former FCC Chairman Tom Wheeler Testimony to Congress, https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Witness%20Testimony_Wheeler_FC_2021.03.22.pdf.

replacement may be required but the cost is relatively low in comparison to the costs associated with required persistent wireless node upgrades.[9] If one looks at long-run "cost per bit" FTTH is almost always the clear winner.

Dr. Timothy Schoechle, PhD, communications technology expert at the National Institute for Science, Law & Public Policy observes that, "[f]iber is unmatched in its speed, performance, reliability, etc. … Wireless is not a substitute for fiber."[10] Fiber is more affordable, scalable from symmetrical (upload and download) speeds of 100 Mbps to 1Gbps to 10Gbps, has a longer life span of 25-50 years and is safer and more cybersecure, has lower operational expenses,[11] and is available at more affordable prices. By contrast, wireless typically requires equipment upgrades, constant maintenance and re-investments about every 5 years. An example of fiber deployment, consumers in Hudson County, TN have multiple service options, which include speeds of up to 1000 Mpbs (1 Gbps). Pricing and capacity are scalable and provide for 300 Mpbs at $57.99/month and 1 Gbps at $67.99, in each instance with symmetrical speeds.[12] Wireless technology is not able to effectively compete with similar high-speed Internet, with the FCC only

[9] A 2020 assessment of the cost to serve a King County, Washington community using FTTP and Fixed Wireless concluded that: "Overall, a fiber investment would have higher capital costs than wireless but much lower operating costs—and would be a better investment over time. Based on engineering and cost-estimation of both a wired (fiber-to-the-premises) and a fixed wireless solution for unserved King County, we conclude that overall, FTTP represents a better broadband solution than fixed wireless for most unserved areas of King County. While FTTP has a higher initial capital cost per passing than a fixed wireless solution, the total cost of operations of FTTP over a 10-year period would be approximately half that of fixed wireless in the same unserved areas—primarily because of the need to replace wireless equipment at relatively short intervals and the cost of leasing space on commercial towers." Broadband Access Study, p. 21, King County, Washington (Dec. 2019), available at https://kingcounty.gov/~/media/depts/it/services/cable/202002-Broadband-Access-Study.ashx?la=en.

[10] Reinventing Wires, Timothy Schoechle, PhD, National Institute for Science, Law and Public Policy, https://electromagnetichealth.org/wp-content/uploads/2018/02/ReInventing-Wires-1-25-18.pdf.

[11] https://optics.fiberbroadband.org/Full-Article/reduce-network-operating-expenses-choose-ftth.

[12] https://bestneighborhood.org/tv-and-internet-hamilton-county-tn/.

requiring 25 Mbps download / 3 Mbps upload speeds.[13, 14] The Fiber Broadband Association has shown that consumers prefer the symmetrical speeds that fiber provides.[15] As the largest fiber optics trade association in the U.S. states, "If it isn't fiber, it isn't broadband."[16]

Most important, the retail price for FTTP is less expensive on a month-to-month basis than most of the current alternatives, especially mobile broadband. This is particularly so if one considers price using consumption (GB uploaded/downloaded over entire billing period) or using instantaneous demand (MB/GB capacity) as the metric.

FTTP provides the best capacity for remote learning for children and students, and more reliable access to medical and other services for the elderly and disabled during emergencies or severe weather when wireless service is more likely to be interrupted. FTTP would also prevent the exclusion of those disabled or suffering from wireless RFR who cannot be near wireless infrastructure or wireless Internet. These residents should have equal access to broadband – a necessary service – in a manner that does not injure them and that does not otherwise put them in harm's way. After all, people cannot adopt a technology that is injuring them.

2. Mobile service is technically inferior, has more use limitations, has worse environmental and aesthetic impacts and costs more at retail.

Mobile broadband is technically inferior to FTTH. It may fit the definition of "advanced telecommunications capability in §706,[17] but it does not afford "comparable speeds, capacities, latency, and other quality of service metrics in a given area, for comparable terms and

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[13] https://www.allconnect.com/blog/internet-speed-classifications-what-is-fast-internet.

[14] https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report.

[15] https://www.broadbandworldnews.com/document.asp?doc_id=773546.

[16] https://s3.amazonaws.com/files.fiberbroadband.org/download/3555.4237?AWSAccessKeyId=AKIAIZGD7FMLIYLBZNIA&Expires=1650065068&Signature=CfFGHmOkZaAovAfuGmXXs2hDpKo%3D.

[17] 47 U.S.C. § 1302(d)(1).

conditions"[18] when compared to FTTH-based services. Mobile broadband has lower speed, less capacity, often higher latency and lower quality of service, and the terms are far more onerous, especially for data.

Mobile broadband service typically has data caps and other use restrictions that make it less attractive as the primary means to fully engage in and use all the features, functions and services that can be accessed through advanced communications capability.[19] Those with limited means need equal access to these full capabilities, and mobile broadband simply does not suffice as the primary source, especially given pricing differences that make FTTH far less expensive on a capacity and per-bit basis and more amenable to sharing between multiple end user devices.

Environmental justice is a major part of diversity, equity and inclusion. "Climate change is an environmental justice issue because certain groups of people in the United States are disproportionately affected by climate change and are less able than others to adapt to or recover from climate change impacts."[20]. Although the *NOI* does not mention environmental justice, the environmental impact of various communications architectures on the "characteristics" covered by the Infrastructure Act must be considered in this proceeding.

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[18] 47 U.S.C. §1754(a)(2).

[19] *Fourteenth Broadband Competition Report*, ¶11 and nn. 41, 42, c*iting* ADTRAN Comments at 7; Common Cause et al. Comments at 3, 21, 25-26; INCOMPAS Comments at 11-12; NTCA Comments at 2-3; Open Technology Institute & Access Now Comments at 12-13; CWA Reply at 4; Open Technology Institute & Access Now Reply at 10, 12-13. 42 ADTRAN Comments at 7; Broadband Connects America Comments at 10; National Rural Electric Cooperative Association (NRECA) Comments at 5-6; CWA Reply at 4. *See also*, *In the Matter of Communications Marketplace Report*, FCC 20-188, ¶¶137-139, 36 FCC Rcd 2945, 3043-3044 & associated notes (Dec. 2020) ("*2020 Communications Marketplace Report*").

[20] United States Environmental Protection Agency, Climate Change, Health, and Environmental Justice (May, 2016), copy available at https://www.cmu.edu/steinbrenner/EPA%20Factsheets/ej-health-climate-change.pdf.

Mobile broadband requires far more energy than does FTTH.[21] The transition to 5G, whether 5G NR (non-standalone) or 5G Standalone NR, will exacerbate this situation until newer and far more efficient equipment can be designed and deployed and 5G networks can fully implement use of their emerging "sleep mode" capability.[22] But even with "sleep mode" the energy consumption profile will still be much higher than that associated with FTTH. Environmental Heath Trust provides an extensive summary of this and much more evidence on the topic, with citation to recent sources, on its website.[23] All this energy consumption will translate into far more greenhouse gas output, thereby contributing to existing climate issues.

Finally, FTTH does not contribute to visual blight or present significant aesthetics concerns. The last mile facilities can be entirely underground or lashed to existing utility infrastructure without much aesthetics ado. One of the most contentious aspects of local permitting for fixed and mobile broadband facilities, on the other hand, is the visual and other aesthetic problems. Simply put, they are ugly and most "concealment" efforts are shockingly

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[21] A 2020 study by the German by the Federal Environment Ministry and the German Environment Agency concluded that "Fiber optic is the most climate-friendly transmission technology" and "Fibre optic video transmission is nearly 50 times more efficient than UMTS." Joint release by the Federal Environment Ministry and the German Environment Agency, Video streaming: data transmission technology crucial for climate footprint Fibre optic video transmission is nearly 50 times more efficient than UMTS, (Oct. 9, 2020), available at, https://www.umweltbundesamt.de/en/press/pressinformation/video-streaming-data-transmission-technology.

[22] The 5G Dilemma: More Base Stations, More Antennas—Less Energy? 5G networks will likely consume more energy than 4G, but one expert says the problem may not be as bad as it seems, Dexter Johnson, IEEE Spectrum (Oct. 3, 2018), available at https://spectrum.ieee.org/will-increased-energy-consumption-be-the-achilles-heel-of-5g-networks. For "sleep mode" background see Ericsson, A technical look at 5G energy consumption and performance, Frenger and Tano (Sept. 19, 2019), available at https://www.ericsson.com/en/blog/2019/9/energy-consumption-5g-nr.

[23] https://ehtrust.org/science/reports-on-power-consumption-and-increasing-energy-use-of-wireless-systems-and-digital-ecosystem/.

ineffective no matter the approach. People just do not want these things near their homes or in scenic areas, and for good reason.

3. Fixed wireless service is technically inferior and costs more from a consumption or demand perspective.

Fixed wireless service is closer to FTTH in terms of performance but still not the same. It too does not afford "comparable speeds, capacities, latency, and other quality of service metrics in a given area, for comparable terms and conditions"[24] when compared to FTTH-based services. Fixed wireless also presents many of the same environmental and aesthetic concerns as mobile, since similar equipment is used. FTTH is the clear preferred solution.

The Commission should always prioritize "fiber to the premise" solutions and rely on mobile or fixed wireless only when fully wired is technically or economically infeasible or the main purpose is mobility.

II. THE COMMISSION MUST FINALLY RECOGNIZE THE EXISTENCE OF AND NEED FOR SPECIAL MEASURES TO ADDRESS THE EMS DISABLED COMMUNITY

The disability community is diverse – there are many kinds of disabilities due to a host of causes. There is, however, a presently invisible and ignored but large and growing part of the disability community that has been specially harmed and suffers unique digital discrimination: those who cannot be around RF because it makes them sick or sicker. Wireless exposure is the direct cause of or a major contributing factor to the very "physical or mental impairment that substantially limits one or more major life activities of" these individuals. 42 U.S.C. §12102(1)(A). Forcing exposure – even as part of a genuine and kind-hearted effort to afford broadband access – is itself a form of discrimination as a matter of law. More important it is fundamentally inequitable because it leads to great harm. Those with this condition are

[24] 47 U.S.C. §1754(a)(2).

functionally excluded from public participation since almost all public spaces are flooded with RF – a toxin to them. When wireless facilities are nearby they cannot even take refuge in their own homes; they are driven out and consigned to a more miserable and sometimes hostile and threatening environment.

The paper attached to this filing goes into greater detail and provides four stories about EMS disabled individuals. There are millions more just like them – and the Commission itself is a major reason they are suffering today. RF sensitivity is ***not*** idiopathic. The biological evidence is clear, the science is clear, the medical community is closing ranks on this issue, and the FCC must now either get in front of the problem or get out of the way and let others with more health expertise and compassion begin instituting solutions.

If the Commission is sincere about achieving "diversity, equity and inclusion" it ***must*** finally recognize this specific problem, accept the blame for the FCC's part in it and take immediate special measures to remediate the harms. There must be an allowance for RF-free "safe zones" in public spaces and buildings to ensure inclusion in public life. Those who cannot be around RF must have the ability, as a matter of right, to obtain wired (fiber-based) broadband as a matter of right; otherwise they will functionally be denied access to any broadband at all. Those who are RF-sensitive and especially those with EMS disabilities – like all other excluded and marginalized communities – must be allowed equal access to broadband in a form that does not threaten or worsen their health and well-being.

CONCLUSION

The Commission should always prioritize "fiber to the premise" solutions and rely on mobile or fixed wireless only when fully wired is technically or economically infeasible or the main purpose is mobility. Those who are RF-sensitive and especially those with EMS disabilities

must be allowed equal access to broadband in a form that does not threaten or worsen their health and well-being. They should be able to obtain FTTH as a matter of right. There must be an allowance for RF-free "safe zones" in public spaces and buildings to ensure inclusion in public life. Those who cannot be around RF must have the ability, as a matter of right, to obtain wired (fiber-based) broadband.

Respectfully Submitted,

Mary Holland Children's Health Defense 1227 North Peachtree Parkway Suite 202 Peachtree City, GA 30269 (917) 743-3868 mary.holland@childrenshealthdefense.org	W. Scott McCollough McCollough Law Firm, P.C. 2290 Gatlin Creek Rd. Dripping Springs, TX 78620 512.512.633.3498 wsmc@dotlaw.biz

Counsel for Children's Health Defense.

The following groups and individuals have granted permission to counsel to submit these comments on their behalf under the name of "Advocates for the EMS Disabled":

Susan Foster, Medical Writer, Fire & Utility Consultant; Odette J. Wilkens, President & General Counsel, Wired Broadband, Inc.; Frank Clegg, (formerly, President of Microsoft Canada), Canadians for Safe Technology; Arizonans for Safe Technology; 5G Free California; Desiree Jaworski, Executive Director, Center for Safer Wireless; Kent Chamberlin, PhD, Former member of the NH Commission to Study The Environmental and Health Effects of Evolving 5G Technology; Californians for Safe Technology; Coloradans for Safe Technology; Larry Ortega, Community Union, Inc.; Paska Nayden, Connecticut for Responsible Technology; Cynthia Franklin, Director, Consumers for Safe Cell Phones; Ms. Antonella DiSaverio; Ms. Eva Bortnick; Families for Safe Technology.org; Howard Goodman, Esq.; Safe Technology Minnesota; Ms. Karol Kuehn; Keep Cell Towers Away, Elk Grove, CA; 5G Free Rhode Island; The Leto Foundation; Maine Coalition to Stop Smart Meters; Mrs. Marie Molnar; Mr. Andrew Molnar; Napa Neighborhood For Safe Technology; MA for Safe Technology; Mrs. Pamela Wallace, Director, Safe Tech Forward Michigan; New Hampshire for Safe Technology; New Yorkers 4 Wired Tech; Oregon for Safe Technology; Eugene J. Bazan, PhD, Secretary, PA Smart Meter Work Group; Pennsylvanians for Safe Technology; Stephen R Dahl, Director, Rhode Islanders for Safe Technology; Safe Tech International, Safe Tech 4 Santa Rosa; Virginians for Safe Technology; Toxics Information Project; Ms. Anne Wilder, Priest River, Idaho; Ms. Donna Romo; Mark Wahl, Director, Citizen League Encouraging Awareness of Radiation of Whidbey Island, WA; Manhattan Neighbors for Safer Telecommunication; ElectromagneticHealth.org; Lendri Purcell, Founder, Families Advocating for Chemical and Toxics Safety; Ms. Linda Dance; Lex Kisteneff, CEO & Founder, The South Carolina Coalition for Wireless Safety Standards; mocoSafeG.org in Montgomery County, MD; and Last Tree Laws

ATTACHMENT TO COMMENTS

Eliminating Digital Discrimination For the EMS Disabled (Susan Foster and Odette J. Wilkins)

Eliminating Digital Discrimination
For the EMS Disabled

According to Amnesty International "discrimination occurs when a person is unable to enjoy his or her human rights or other legal rights on an equal basis with others because of an unjustified distinction made in policy, law or treatment." "Indirect discrimination is when a law, policy, or practice is presented in neutral terms (that is, no explicit distinctions are made) but it disproportionately disadvantages a specific group or groups." "Direct discrimination is when an explicit distinction is made between groups of people that results in individuals from some groups being less able than others to exercise their rights."[1]

"Digital discrimination" usually refers to bias built into algorithmic systems, such as in Internet search engines such as Google or Yahoo, "which gives rise to various forms of 'digital discrimination.'"[2] The Federal Communications Commission's Notice of Inquiry[3] uses the phrase in a different sense: it focuses on whether there is systemic discrimination in access to the "high-quality, affordable broadband" that allows people to use and enjoy the Internet. *FCC DEI NOI* ¶¶1, 2. This paper demonstrates that those who are disabled[4] by injuries caused by wireless radiation suffer from ***both*** algorithmic and access-based digital discrimination, sometimes directly and sometimes indirectly. The Commission has significantly contributed to this discrimination, at times knowingly so.

There is a large and diverse community of individuals who significantly suffer from wireless radiation exposure from wireless base stations, cell phones and other telecommunications infrastructure and devices. Many have symptoms that give rise to "impairment[s] that substantially limit[] one or more major life activities" 42 U.S.C. §12102(1)(A). Although there are various names for the condition, a common term is electro-magnetic sensitivity (EMS). Those with severe symptoms are "EMS disabled."

This White Paper addresses:

- The impact of digital discrimination on the EMS disabled
- The EMS disabled are disadvantaged communities

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[1] Amnesty International, Discrimination, available at https://www.amnesty.org/en/what-we-do/discrimination/.

[2] "Algorithmic Regulation" by Karen Yeung and Martin Lodge, chapter on "Digital Discrimination" by Natalia Criado, 2019, https://oxford.universitypressscholarship.com/view/10.1093/oso/9780198838494.001.0001/oso-9780198838494-chapter-4#:~:text=Digital%20discrimination%20entails%20treating%20individuals,automatically%20processed%20by%20an%20algorithm.

[3] Notice of Inquiry, Implementing the Infrastructure Investment and Jobs Act: Prevention and Elimination of Digital Discrimination, FCC 22-21, GN Docket No. 22-69 (Mar. 2022) ("*FCC DEI NOI*").

[4] A Centers for Disease Control website "What is disability?" explains that:

A disability is any condition of the body or mind (impairment) that makes it more difficult for the person with the condition to do certain activities (activity limitation) and interact with the world around them (participation restrictions). There are many types of disabilities, such as those that affect a person's:

Vision	Remembering	Hearing
Movement	Learning	Mental health
Thinking	Communicating	Social relationships

Although "people with disabilities" sometimes refers to a single population, this is actually a diverse group of people with a wide range of needs. Two people with the same type of disability can be affected in very different ways. Some disabilities may be hidden or not easy to see.

- Brief history on the disabled community's efforts to end discrimination
- How EMS communities compare to other disabled communities
- The settled science from the FCC, FDA, industry and independent experts on EMF health effects
- Federal agencies creating barriers for relief for the EMS disabled
- Energy consumption and pollution from wireless Infrastructure
- The need to accommodate the EMS disabled, metrics and guidelines
- Adopting Former FCC Chairman Tom Wheeler's "fiber-first" policy: fiber optics broadband is a necessity for disadvantaged communities, is the best solution to bridge the digital divide (although adopting a fiber-first policy would ameliorate but not eliminate discrimination against the EMS disabled)
- Addendum: Stories of the EMS disabled – in their own words

The Impact of Digital Discrimination on the EMS Disabled

Digital discrimination involving algorithmic bias, e.g., in Internet search engine results, reflects and amplifies discrimination in physical space. The EMS disabled suffer algorithmic bias. Search results belittle and invalidate the sufferings of the EMS disabled. The following provides an insight into algorithmic bias:

> "Digital discrimination entails treating individuals unfairly, unethically, or just differently based on their personal data that is automatically processed by an algorithm. Digital discrimination often reproduces the existing instances of discrimination in the offline world by either inheriting the biases of prior decision-makers, or simply reflecting widespread prejudices in society."[5]

For example, the scourge of racial discrimination has existed in the physical world throughout history. Its reflection in digital technologies is a new and emerging problem, arising from algorithms' use of race as a profiling factor.[6] Algorithmic biases also discriminate against the EMS disabled. A simple search on Google, for instance, yield results showing a bias against EMS symptoms caused by electro-magnetic frequencies (EMFs) or wireless radiation, despite settled scientific evidence to the contrary. However, the range of issues to address regarding the EMS disabled is even greater than just digital discrimination and extends to misinformation on the Internet that disadvantages the EMS disabled, though not specifically data run through algorithms.

The EMS disabled also significantly suffer from access discrimination, the subject of the *FCC DEI NOI*. They too need broadband, but exposure to wireless broadband emissions sets off their symptoms, so they cannot use wireless technologies or even be around wireless systems. They must use only wired broadband at home or work. A nearby wireless system can drive them from their own homes – a form of constructive eviction. Further, they must avoid many public spaces, including most government and civic buildings that are pervasively covered with electro-magnetic frequencies (EMFs) and radio frequency radiation (RFR) so they cannot meet in person with their government representatives or gather in public with the rest of society. The EMS disabled are unable to work or participate in society and they are routinely even driven from their homes and into homelessness. They egregiously suffer from direct and indirect digital

[5] Digital Discrimination, Id.

[6] "Emerging digital technologies entrench racial inequality, UN expert warns," https://www.ohchr.org/en/press-releases/2020/07/emerging-digital-technologies-entrench-racial-inequality-un-expert-warns.

discrimination in the physical world, they face significant access discrimination and they are subjected to algorithmic discrimination.

The EMS Disabled are Disadvantaged Communities

President Biden's Justice40 Initiative is designed "to deliver at least 40 percent of the overall benefits from Federal investments in climate and clean energy to disadvantaged communities."[7] The project focused on how disadvantaged communities should be defined[8] and what metrics the Environmental Protection Agency (EPA) should use to achieve the Initiative's goals.

How disadvantaged communities are defined is important and needs to be flexible and inclusive. The *FCC DEI NOI* correctly and properly includes the disabled as a whole, but it entirely ignores those disabled by injuries caused by wireless radiation – the EMS disabled. The *FCC DEI NOI* itself discriminates.

The EMS disabled, however, are disadvantaged communities. As an environmental justice issue, the communities that have been left behind are those injured from wireless radiation from base stations, cell phones, and telecommunications infrastructure facilities placed right next to their homes, businesses, schools, medical facilities and other public locations. These disadvantaged communities are significantly suffering from wireless radiation exposure as a result. Base station antennas are being forced onto residents, without notice, without their consent, and without any consideration to injuries to their health, no matter how much they are injured and despite incontrovertible evidence of those injuries.

Wireless radiation cannot be perceived with the naked eye or by smell (such as gas leaking from a stove) and therefore goes unnoticed until one develops symptoms or is injured by it. Nor is there an alarm, as is required for carbon monoxide detection, which also cannot be perceived with the naked eye or by smell, until it is too late to recover. Because wireless radiation is invisible, so, apparently, are the EMS disabled.

Presenting the information in this white paper is an effort to make visible what is otherwise invisible.

Those suffering from exposure to wireless radiation are known as having electromagnetic sensitivity (EMS), or EMS disabled, electromagnetic sensitivity ((ES), radiation poisoning or microwave radiation sickness. For purposes of this paper, we will use the U. S. Access Board designation of EMS disability going back to 2002.[9] Common EMS symptoms include sleep disturbances, chronic fatigue, chronic pain, poor short-term memory, difficulty concentrating (e.g., "brain fog"), mood disturbances (depression/ anxiety), skin problems, dizziness, loss of appetite, heart palpitations, tremors, vision problems, tinnitus, nose bleeds, asthma, reproductive problems and headaches, to name a few.[10]

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[7] https://www.whitehouse.gov/omb/briefing-room/2021/07/20/the-path-to-achieving-justice40/

[8] Native Americans are properly also considered disadvantaged communities. The United Keetoowah Tribe brought suit against the FCC because of the FCC's failure to conduct environmental review of 5G deployment under the National Environmental Policy Act (NEPA). The Court of Appeals for the D.C. Circuit in 2019 found that the FCC acted in an arbitrary and capricious manner in its rule for massive deployment of small cells, particularly with the planned 800,000 locations for 5G deployment in the U.S. To date, there has been no environmental review of 5G, and yet 5G is being deployed unabated.

[9] U.S. Access Board, Advancing Full Access & Inclusion for All, "Indoor Environmental Quality Project," https://www.access-board.gov/research/building/indoor-environmental-quality/.

[10] "Electrohypersensitivity as a Newly Identified and Characterized Neurologic Pathological Disorder" Int'l Journal of Molecular Sciences, https://www.mdpi.com/1422-0067/21/6/1915.

EMS symptoms have been legally recognized as functional impairments. Sweden was the first country to recognize EMS as a functional impairment in 2002. EMS also became recognized: (a) in 2002 by the U.S. Access Board (the federal agency devoted to accessibility issues for people with disabilities),[11] (b) in 2007 by the Canadian Human Rights Commission,[12] and (c) in 2009 by the European Parliament.[13] Courts have awarded disability claims to people with ES in Australia,[14] France,[15] Spain,[16] United Kingdom,[17] and United States.[18]

Access, digital equity and digital inclusion are vitally important for those disabled or suffering from wireless radiation. The U.S. Access Board (which advises the Justice Department and other state and federal agencies under the Americans with Disabilities Act) notes that a U.S. National Institute of Building Sciences survey of a representative region found that 2-6% of the population are sensitive to electro-magnetic fields.[19] There are other sources showing the proliferation of EMF sensitivities and disabilities.[20]

A 2019 Bevington study,[21] analyzed the prevalence of EMF/EHS within the population:

0.65% Can't work
1.5% Severe symptoms
5% Moderate symptoms
30% Mild symptoms

Based on a population of 332.4 million people in the U.S., the numbers are shockingly high:

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[11] Johansson O. Electrohypersensitivity: state-of-the-art of a functional impairment. Electromagn Biol Med. 2006;25(4):245-58. doi: 10.1080/15368370601044150. PMID: 17178584.

[12] Policy on Environmental Sensitivities, Canadian Human Rights Commission, 2007, Policy Reviewed 2014.

[13] Full recognition of electromagnetic hypersensitivity (EHS) in Europe, European Parliament, 2009.

[14] 'Wi-fi allergies' issue flares up in Australia, iTnews, https://www.itnews.com.au/news/wi-fi-allergies-issue-flares-up-in-australia-356354.

[15] A Woman Has Been Awarded Compensation For Being "Allergic to Wi-Fi", ScienceAlert, 31 August 2015, https://www.sciencealert.com/a-woman-has-been-award-compensation-for-being-allergic-to-wi-fi.

[16] Spain: High Court of Madrid Ruling Recognizes "Electrosensitivity" as Grounds for Total Permanent Disability, August 4, 2016, Maris, https://www.elettrosensibili.it/2016/09/14/spain-high-court-of-madrid-ruling-recognizes-electrosensitivity-as-grounds-for-total-permanent-disability/.

[17] Gadget 'allergy': French woman wins disability grant, August 27, 2013, BBC News, https://www.bbc.com/news/technology-34075146

[18] JML Law Wins Appeal in 'Unprecedented' Disability Case Against LAUSD For Failure to Accommodate Teacher With Electroma, March 26, 2021, Bloomberg https://www.bloomberg.com/press-releases/2021-03-26/jml-law-wins-appeal-in-unprecedented-disability-case-against-lausd-for-failure-to-accommodate-teacher-with-electroma.

[19] U.S. Access Board – Advancing Full Access & Inclusion for All - "Indoor Environmental Quality Project," https://www.access-board.gov/research/building/indoor-environmental-quality/.

[20] Electrohypersensitivity (EHS) Is An Environmentally-Induced Disorder That Requires Immediate Attention, Dr. Magda Havas, J. Sci Discov (2019), http://www.e-discoverypublication.com/wp-content/uploads/2019/03/JSD18020-final.pdf; Presentation by Karl Maret, M.D., M.Eng., Presentation, 1-17-20, https://www.youtube.com/watch?v=XiIsy3mcjcY; "The Bioinitiative Report," https://bioinitiative.org/.

[21] "The Prevalence of People with Restricted Access to Work in Manmade Electromagnetic Environments," Journal of Environment and Health Science, https://mdsafetech.files.wordpress.com/2019/10/2018-prevalence-of-electromagnetic-sensitivity.pdf.

Percentages	Number of U.S. EMF Sensitive/Disabled
Can't work – 0.65%	2.16 million
Severe symptom – 1.5%	4.99 million
Moderate symptoms – 5%	16.6 million
Mild symptoms – 30%	99.7 million

Vulnerable communities are significantly and negatively affected by wireless radiation. Many of the EMS disabled and EMS sensitive are already disadvantaged and/or indigent and the condition only makes things worse. The condition itself often turns even accomplished professionals into indigency. The EMS Disable and EMS sensitive are not able to live, work or visit in spaces or buildings where wireless equipment is deployed. They also cannot successfully participate in virtual remote settings using free wireless connectivity because wireless broadband is a barrier to them: their lives are placed in jeopardy with any exposure to wireless. Children are also a vulnerable community and there is documented research on the adverse effects of wireless radiation as it penetrates even more deeply into the skulls of children compared to adults.[22]

Access to work is critical for disadvantaged communities. The EMS disabled are most affected when they cannot work safely in environments containing wireless radiation inside a building, such as Wi-Fi, or wireless radiation coming from outside a building from nearby base station antennas.[23] This is not a disability that only affects the EMS disabled but given the estimated number of people with EMS symptoms in the U.S., it has the potential of adversely affecting America's workforce. EMS disability can be accommodated by creating wireless radiation free zones that employ only wired facilities in the work environment.

Brief History On the Disabled Community's Efforts to End Discrimination

The Rehabilitation Act of 1973 was a starting point, but the most significant express validation of and protection for the disabled was finally achieved in the U.S. with the passage of the Americans with Disabilities Act of 1990 (ADA). The manner of its passage is noteworthy. Wheelchair-bound Americans took to the Capitol steps, left their wheelchairs behind and crawled up the Capitol steps. Included among them was an 8-year-old disabled girl. This demonstration by these "wheelchair warriors" was captured by the media and called the "Capitol Crawl," as "a physical demonstration of how inaccessible architecture impacts people with disabilities."[24] The ADA extended the prohibition against discrimination beyond federal contractors to employment, public services and accommodations.[25]

[22] See, https://ehtrust.org/research-on-childrens-vulnerability-to-cell-phone-radio-frequency-radiation/ and https://ehtrust.org/science/scientific-imaging-cell-phone-wi-fi-radiation-exposures-human-body/.

[23] "The Prevalence of People with Restricted Access to Work in Manmade Electromagnetic Environments," https://mdsafetech.files.wordpress.com/2019/10/2018-prevalence-of-electromagnetic-sensitivity.pdf.

[24] History Series, "When the 'Capitol Crawl' Dramatized the Need for Americans with Disabilities Act," https://www.history.com/news/americans-with-disabilities-act-1990-capitol-crawl.

[25] International Brotherhood of Teamsters, "The Rehabilitation Acts of 1973 and 974, and the Americans with Disabilities Act of 1990," https://teamster.org/rehabilitation-acts-1973-and-1974-and-american-disabilities-act-1990/.

EMS disability is as silent and invisible as the toxin that creates the disability in the first place. The 3% (mild) and 35% (moderate)[26] portion of the population (between 9,975,000 or 115,500,000 million Americans) suffering from EMS, however, cannot travel to Washington DC to potentially sit on the Capitol steps. RF is so pervasive any effort similar to the "Capitol Crawl" to raise awareness would put them at physical risk. These people have been silenced and rejected. They are isolated from play with other children, from study with fellow students, from advancement in the workforce and the financial means to support themselves in anything but subsidized housing. But even federally-subsidized housing is becoming inaccessible since those buildings appear to be a target for wireless tower leases because it is the path of least resistance in increasingly resistant communities.

How EMS Disabled Communities Compare to Other Disabled Communities

The percentages of the EMS disabled are either comparable to or exceed the percentages of other disabled communities. The percentages of the population with electrosensitivity can range, internationally, from 1.5% to 13.3%. Also, based on Bevington's 2019 study cited above, percentages in the U.S. can range from .65% to 30%, depending on symptom severity.

Many countries have documented a prevalence rate for electrosensitivity in several population-based studies of: 1.5% in Sweden (Hillert et al, 2002); 3.2% in California (Levallois, 2002); 5% in Switzerland (Huss, 2002); 9% in Germany (INFAS, 2006); 11% in the England (Hallberg & Oberfeld, 2006); 3.5% in Austria (Schröttner, 2008); and 13.3% in Taiwan (Tseng, 2011). The World Health Organization has noted that "approximately 10% of reported cases of EHS were considered severe." (A similar term to EMS, EHS means electro-hyper-sensitivity.)

Other disabilities now widely recognized in the U.S. include intellectual and developmental disability and mobility disability. According to the Special Olympics, 1.9% of the U.S. population or about 6.5 million people in the U.S. have an intellectual and developmental disability The American Association of Intellectual and Developmental Disabilities notes that this disability can be caused by injury, disease, or a problem in the brain, severe head injury, stroke, neonatal complications, and may include Down Syndrome, Fetal Alcohol Syndrome or Fragile X Syndrome. According to the Centers for Disease Control (CDC), mobility disability (defined by the CDC as "serous difficulty walking or climbing stairs") affects 13.7% of the population, or 45.2 million people in the U.S.

Location	**Percentages of Electrosensitivity**
Sweden	1.5%
California	3.2%
Austria	3.5%
England	11%
Switzerland	5%
Germany	9%
Taiwan	13.3%
United States	3.2% - 30%

[26] C4ST Referencing Havas 2007, https://c4st.org/what-is-electrosensitivity/.

United States	**Percentages of Other Disabled People**	**Millions Of People**
Intellectual & Developmental Disability	1.9%	6.5 mil
Mobility Disability	13.7%	45.2 mil

The Settled Science from Industry, Independent Scientists and Experts, and the FCC and FDA On EMF Health Effects

Industry's Settled Science:

In 2000, the ECOLOG Institute, a research organization founded in 1991 by scientists from the University Hannover, was commissioned by T-Mobile in Germany (parent company to T-Mobile in the U.S.), to study the risks of electromagnetic fields (EMFs) because of the rapidly expanding mobile telecommunications industry. The aim was to evaluate EMF risks and the need for implementing precautionary health protection. The results were twofold: (1) findings of adverse health impacts associated with exposure to EMFs and (2) strong precautions and warnings to significantly lower the power of the EMFs to which the public would be exposed.[27]

This 2000 ECOLOG Institute study was apparently never distributed nor translated into English until a copy was leaked almost a decade later to a nonprofit who commissioned its translation. Here are some of the findings:

1. **Cancer:** "[e]lectromagnetic fields with frequencies in the mobile telecommunications range do play a role in the development of cancer. This is particularly notable for tumours of the central nervous system, for which there is only the one epidemiological study so far, examining the actual use of mobile phones. The most striking result of this study was an obvious correlation between the side at which the phone was used and the side at which the tumour occurred."
2. **Leukemia:** "Higher risks were also demonstrated for several forms of leukaemia."
3. **Testicular Cancer:** "The epidemiological findings for testicular cancer also need to be interpreted in conjunction with the results of the studies of fertility problems occurring in relation to high frequency electromagnetic fields.
4. **Cellular Research & Cancer:** "The results of the studies for all stages of cancer development from the damage of the genetic material via the uninhibited proliferation of cells and debilitation of the immune system (see below) up to the manifestation of the illness prove effects at power flux densities of less than 1 W/m2. For some stages of cancer development, intensities of 0.1 W/m2 or even less may suffice to trigger effects."
5. **Debilitation of the Immune System:** "Damaging effects on the immune system which can aid the development of illnesses were demonstrated in animal experiments at power flux densities of 1 W/m2 (mouse, exposure duration 6 days, 3 hours per day, SAR (mouse) 0.14W/kg). In in vitro

[27] Mobile Telecommunications and Health/Review of the current scientific research, ECOLOG Institut, Hannover, April 2000, available at https://docs.google.com/document/d/1Rd2c900GURf9YYQY-L2MHAFDYGlEt2R1tyMZYQhZTEA/edit.

experiments on lymphocytes, defects of the genetic material were demonstrated at power flux densities of circa 10 W/m^2. The presence of stress hormones, which when permanent can debilitate the immune system, was found to be increased in human experiments from power flux densities of 0.2W/m^2. In animal experiments (rat) a similar effect was observed at a Specific Absorption Rate of circa 0.2 W/kg."

6. **Influences on the Central Nervous System and Cognitive Function:** "Effects of high frequency electromagnetic fields on the central nervous system are proven for intensities well below the current guidelines. Measurable physiological changes have been demonstrated for intensities from 0.5 W/m^2. Impairments of cognitive functions are proven for animals from 2W/m^2."
7. **Electrosensitivity or Electromagnetic Hypersensitivity:** The sensitivity manifests in a variety of symptoms including: nervous symptoms such as sleep disturbances, headaches, exhaustion, lack of concentration, irritability, anxiety, stress, cardiovascular complaints, disruptions of hormones and metabolism, skin complaints. The composition and strength of the complaints varies enormously in different individuals. The correlation of the complaints with electromagnetic exposures and other environmental influences seems to vary strongly not only between affected persons but also in time, a fact that has so far impeded the conclusive scientific proof of a cause-effect relationship in provocation studies. The present results of scientific studies are often not conclusive and partly contradictory. On the other hand, however, there is a wealth of data.

   "On the basis of current knowledge it is impossible to estimate the risk of electrosensitive reactions or to make recommendations for guidelines designed to avoid such a risk for the general population, ***which is composed of sensitive and non-sensitive persons***". [Emphasis added]

The ECOLOG Institute then went on to emphasize the importance of developing "a strategy for the research of the electrosensitivity phenomenon and its incidence, ***which would acknowledge the failure of traditional scientific methods to address the problem and allow the inclusion of the data available from the self-help groups and associations of the affected.***" [Emphasis added]. The ECOLOG study recommended that when the risk is impossible to estimate, precautionary health measures must be implemented:

- "If a security factor of 10 is applied to this value, as it is applied by ICNIRP and appears appropriate given the current knowledge, the precautionary limit should be 0.01W/m2. This should be rigorously adhered to by all base stations near sensitive places such as residential areas, schools, nurseries, playgrounds, hospitals and all other places at which humans are present for longer than 4 hours."

Exposures of Mobile Phone Users

- "Given the state of technology now and in the foreseeable future, it is currently technically impossible to apply the recommended maximum value for mobile base stations also to the use of mobile phones. However, a lowering of the guidelines to a maximum of 0.5 W/m2 should urgently be considered."
- "A particular problem in this exposure group is posed by children and adolescents, not only because their organism is still developing and therefore particularly susceptible, but also because many adolescents have come to be the most regular users of mobile phones."
- "Advertising towards this population group should be banned. Furthermore, particular efforts should be made to lower the exposures during calls. It would be recommendable to conduct

> (covert) advertising campaigns propagating the use of headsets. It would also be important to develop communications and advertising aiming at minimising the exposures created by carrying mobile phones in standby mode on the body."

In direct conflict with these findings and warnings, 22 years later, T-Mobile (U.S.) states on its website under "**Radio Frequency Safety:"**[28] Wireless phones emit low levels of radio-frequency (RF) energy during use. ***Based on scientific data currently available, T-Mobile has not determined that RF energy from wireless phones causes health risks.*** Nonetheless, we want our customers to be informed as the wireless industry and government agencies continue to monitor the ongoing scientific research on this important subject. [Emphasis added]

T-Mobile has chosen to not just ignore, but went on to purposefully misrepresent, the study results it commissioned.

There may be no better example of misinformation on the Internet that disadvantages the disabled, though not specifically data run through algorithms. Rather, this is an omission of the facts and findings of the ECOLOG Institute. The recommendations were replete with warnings to bring the levels of radiation down, particularly in vulnerable locations "residential areas, schools, nurseries, playgrounds, hospitals and all other places at which humans are present for longer than 4 hours."

This misinformation has been perpetuated by global health organizations and government agencies: FCC, FDA and National Cancer Institute (NCI).[29] A fourth website is the World Health Organization (WHO) which also has a similar bias (due to conflicts of interests since a number of ICNIRP members are also members of the WHO EMF Project). [30] There appears to be no representation of the EMS disabled population in these institutions.

The damage this misinformation has caused the health and well-being of populations globally and particularly, the invisible and silenced EMS disability population, is unknown. But the outcome is easy to see. Many have been silenced, in very large part, because their friends, family members, physicians and local, state and federal government leaders get their information from the same four biased websites.

Facts and Statements by U.S. Preeminent Scientists and Experts In the Area of RFR Research

As shown by the following facts and statements by the United States' preeminent scientists and experts in the area of wireless RFR research, it is well established that wireless radiation exposure produces or has the recognized potential of producing biological effects.

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[28] "Radio frequency safety," https://www.t-mobile.com/responsibility/consumer-info/safety/radio-frequency-safety.

[29] The FCC states that "currently no scientific evidence establishes a causal link between wireless device use and cancer or other illnesses."

The FDA, states that, based on current data, it "believes that the weight of scientific evidence does not show an association between exposure to radiofrequency from cell phones and adverse health outcomes."

The National Cancer Institute states that "although there have been some concerns that radiofrequency energy from cell phones held closely to the head may affect the brain and other tissues, to date there is no evidence from studies of cells, animals, or humans that radiofrequency energy can cause cancer."

[30] The World Health Organization states that "to date, no adverse health effects have been established as being caused by mobile phone use," despite a "large number of studies [that] have been performed over the last two decades to assess whether mobile phones pose a potential health risk."

1. In 2011, the World Health Organization's (WHO) International Agency for Research on Cancer (IARC) classified wireless radiation as a Group 2B possible carcinogen.[31] This conclusion was based upon an increased risk of malignant brain cancer (glioma) identified in those who used cell phones for over 10 years for an average of 30 minutes per day.

   Anthony B. Miller, M.D., Senior Epidemiologist, IARC, states in a 2018 updated assessment to the 2011 IARC classification of wireless radiofrequency radiation (RFR), "***When considered with recent animal experimental evidence, the recent epidemiological studies strengthen and support the conclusion that RFR should be categorized as carcinogenic to humans (IARC Group 1).*** [32]

2. "Since 2011, the scientific evidence linking wireless to cancer has significantly increased and today several published reviews conclude that the current body of evidence indicates cell phone radiation is proven Group 1 human carcinogen (Miller et al 2018, Peleg et al 2018 Carlberg and Hardell 2017, Belpomme et al 2018)." [33]

3. Christopher J. Portier, Ph.D., former director of the National Center for Environmental Health at the Centers for Disease Control and Prevention (CDC) and a scientific advisor for the WHO, reviewed the most recent body of scientific research and literature to look at the feasibility of RFR causing specific brain tumors in humans and concluded in March, 2021:

   - "***Given the human, animal and experimental evidence, I assert that, to a reasonable degree of scientific certainty, the probability that RF exposure causes gliomas and neuromas is high***." [34]

4. In 2021, the Court of Appeals for the D.C. Circuit in *EHT et al v. FCC* ruled that the FCC's 2019 decision to maintain their 26-year-old thermal-based exposure "safety" guidelines demonstrated that the FCC was acting in an ***"arbitrary and capricious"*** manner ***"in its complete failure to respond to comments concerning environmental harm caused by RF radiation"*** below the current FCC limits.[35]

   The Court further ruled that, "***The factual premise—the non-existence of non-thermal biological effects—underlying the current RF guidelines may no longer be accurate***." The Court pointed out that the FCC had ignored scientific evidence documenting biological harm at non-thermal levels (i.e., at levels hundreds and even thousands of times below the current FCC wireless exposure "safety" guidelines). Indeed, 11,000 pages of scientific studies of biological hazards from RFR and hundreds of

[31] https://www.iarc.who.int/wp-content/uploads/2018/07/pr208_E.pdf

[32] https://www.sciencedirect.com/science/article/abs/pii/S0013935118303475

[33] https://ehtrust.org/science/whoiarc-position-on-wireless-and-health/

[34] https://www.saferemr.com/2021/03/expert-report-by-former-us-government.html?m=1

[35] *Envtl. Health Tr., et al. v. FCC*, 9 F.4th 893 (D.C. Cir. 2021). For overview of the case, see generally https://ehtrust.org/in-historic-decision-federal-court-finds-fcc-failed-to-explain-why-it-ignored-scientific-evidence-showing-harm-from-wireless-radiation/.

personal accounts of injuries from RFR were in the FCC docket. The Court of Appeals admonished the FCC that it could not ignore all this scientific evidence.

5. Ronald Melnick, Ph.D., retired NIEHS senior toxicologist who won the American Public Health Association's 2007 David P. Rall Award for public health advocacy states:

> ***"I strongly feel health and regulatory agencies should promote policies that reduce cell phone radiation exposure, especially for children and pregnant women. The agencies in the U.S. say, "if you are concerned" rather than "we are concerned." Agencies should be clear and straightforward educating the public on "here is what you should do."***
>
> ***"The risk can be greater for children than adults due to the increased penetration of the radiation within brains of children and the fact that the developing nervous system is more susceptible to tissue damaging agents."*** [36]

6. The American Academy of Pediatrics, a non-profit professional organization of 60,000 primary care pediatricians, pediatric medical subspecialists, and pediatric surgical specialists, stated in a letter to the FCC on July 12, 2012:

> ***"Children … are not little adults and are disproportionately impacted by all environmental exposures, including cell phone radiation. In fact, according to IARC, when used by children, the average RF energy deposition is two times higher in the brain and 10 times higher in the bone marrow of the skull, compared with mobile phone use by adults."***[37]

7. New Hampshire formed a State Commission to examine whether wireless radiation is harmful to human health. The majority of that New Hampshire State Commission came to the conclusion that exposure to wireless radiation is harmful to human health and the environment. The commission was convened through bipartisan legislation[38] that was signed by the governor. Commission membership included unbiased experts in fields relating to health and radiation exposure, and they issued their Final Report in November 2020.[39] A quote from that report (taken from Recommendation 1) provides the Commission findings with regards to the effectiveness of FCC regulations:

> ***"The majority of the Commission believes that the FCC has not exercised due diligence in its mission to manage the electromagnetic environment by not setting exposure limits that protect against health effects. They have failed to support technical means and investigations aimed at reducing human exposures to electromagnetic radiation (EMR) in telecommunications systems and optimize wireless modulations to reduce biological and health impacts."***

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[36] https://www.youtube.com/watch?v=zSx_yDzxvM8&t=2295s

[37] https://ehtrust.org/wp-content/uploads/American-Academy-of-Pediatrics-letter-to-the-FCC-July-12-2012.pdf; see also images of cell phone usage by children and the penetration of wireless radiation into the brain https://ehtrust.org/research-on-childrens-vulnerability-to-cell-phone-radio-frequency-radiation/.

[38] https://legiscan.com/NH/text/HB522/2019.

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

8. Experts from the technology industry have also spoken out about the hazards of wireless radiation, e.g.: Frank Clegg, former President of Microsoft Canada,[40] and Jeromy Johnson, who holds an advanced degree in Civil Engineering and worked in Silicon Valley's financial industry for over 15 years[41] and who was personally impacted by wireless radiation.

9. Physicians, scientists and engineers have documented the adverse effects of wireless radiation. See, e.g. the statements of 57 physicians, 19 scientists and an engineer in a smart meters case brought in Pennsylvania's Supreme Court, and supported by an amicus brief in 2021 of 80 organizations, based on the adverse effects of wireless radiation.[42]

10. EMF researchers and physicians have authored more than 20 position papers and resolutions cautioning about EMF health risks (e.g. in 2016, 220 scientists from 42 countries signed an International Appeal directed to the United Nations and the WHO, calling for protection from non-ionizing EMF exposure).[43]

11. The European Parliament has recognized "The European Parliament … calls on Member States to follow the example of Sweden and to recognise persons that suffer from electrohypersensitivity as being disabled so as to grant them adequate protection as well as equal opportunities."[44]

You can also hear directly from grassroot communities of the health problems that they have been experiencing from RFR radiation. An example is in Pittsfield, MA where long-time residents and their children suffered from serious physical ailments, including vomiting in their beds, after the installation of a wireless cell tower near their homes, and from which they had to evacuate.[45] The Pittsfield, MA Board of Health recently issued an emergency order to a telecommunications carrier to show cause why a cease and desist order should not be issued against the carrier to turn off a cell tower based on express findings of

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[40] https://www.youtube.com/watch?v=h4TdY344Now.

[41] https://www.youtube.com/watch?v=F0NEaPTu9oI.

[42] *Povacz v. Pennsylvania Public Utility Commission*, https://childrenshealthdefense.org/wp-content/uploads/Brief-and-Addendum-Submitted-9-14.pdf, starting on p.64; for an overview of the case, see https://childrenshealthdefense.org/defender/chd-amicus-brief-supreme-court-pennsylvania-reject-smart-meters-mandate/.

[43] EUROPAEM EMF Guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses, Belyaev et al, Rev Environ Health 2016, DOI 10.1515/reveh-2016-0011, Received March 16, 2016; accepted May 29, 201, available at https://www.diagnose-funk.org/download.php?field=filename&id=363&class=DownloadItem.

[44] "Digitalization Challenges for Europe," https://www.eesc.europa.eu/sites/default/files/files/qe-01-19-295-en-n.pdf; "European Parliament, Health Impact of 5G," https://ehtrust.org/the-european-parliament-panel-health-impact-of-5g/; European Parliament – Policy Recommendations On Cell Phones, Wireless Radiation & Health, May 10, 2017, https://ehtrust.org/european-parliament-policy-recommendations-cell-phones-wireless-radiation-health/; European Parliament resolution on the health problems associated with electromagnetic fields (2008/2211), https://www.europarl.europa.eu/doceo/document/TA-6-2009-0216_EN.html.

[45] https://ehtrust.org/statement-by-courtney-gilardi-after-pittsfield-board-of-health-votes-to-send-cease-and-desist-order-for-verizon-cell-tower/.

injuries sustained by residents as a result of the cell tower.[46] There have been other reports of health effects from cell towers.[47]

Federal Communications Commission: The FCC admitted in 2019 that at least some RFRs can cause instantaneous non-thermal adverse effects with radio-frequency radiation (RFR) frequencies ranging between 3 KHz and 10 MHz.[48] However, the FCC averages exposure levels over 30 minutes, which completely obscures the effects of the pulsating nature of RFR and does not account for 24/7 exposure to RFR or its constant pulsations by the population.

Food and Drug Administration:

Linda Birnbaum, Ph.D., former Director of the U.S. NIEHS and former Director of the National Toxicology Program (NTP) spanning across the Department of Health and Human Services organizations which involves NIH, FDA and CDC, has stated: [49]

- ***"Effects from [wireless] radiofrequency radiation (RFR) such as genetic toxicity, immunotoxicity, oxidative stress, changes in gene and protein expression, changes in cell differentiation and proliferation, and increased permeability of the blood brain barrier were reported in these [scientific] publications." (pg. 8).***
- ***"The phase I [NTP] studies established that non-thermal levels (<1^{O}C or no detectible change in temperature) of RFR exposure had toxicological implications in biological systems." (pg. 9).***
- ***"The NTP found and published evidence of DNA damage after only 90 days of exposure." (pg. 9).***
- ***"Overall, the NTP findings demonstrate the potential for RFR to cause cancer in humans. The independent peer review of the entire proceedings carried out by toxicologists, pathologists and statisticians independent of the NTP staff conducted March 26-28, 2018, concluded that there was 'clear evidence of cancer,'…exposure to RFR is associated with an increase in DNA damage." (pg. 11).***

NOTE: NTP refers to the National Toxicology Program.[50] Since completion of the $30 million NTP study (originally sponsored by the FDA to research possible biological effects of RFR), the results have been replicated by the Ramazzini Institute[51] in another study using exposures below the FCC thermal thresholds [52] (simulating emissions from cellular base stations and wireless transmitters).

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[46] https://ehtrust.org/wp-content/uploads/Pittsfield-Health-Board-Cell-Tower-Order-to-Verizon-April-11-2022-FINAL-REDACTED.pdf; see also, https://ehtrust.org/the-first-cease-and-desist-order-against-verizon-cell-tower-to-be-sent-on-friday-by-by-board-of-health-pittsfield-ma/.

[47] Cell Tower Health Effects https://www.saferemr.com/2015/04/cell-tower-health-effects.html, Center for Family and Community Health, School of Public Health, University of California, Berkeley.

48 *Proposed Changes in the Commission's Rule Regarding Human Exposure to Radiofrequency Electromagnetic Fields*, 34 FCC Rcd 11687, 11743-11745, ¶¶122- 124 & nn. 322-335 (2019). It also noted that these harms occur instantaneously. The FCC currently averages exposure levels over 30 minutes, which completely obscures the acknowledged instantaneous response.

[49] https://ehtrust.org/wp-content/uploads/20-1025-Amicus-Brief-Joe-Sandri.pdf.

[50] https://ntp.niehs.nih.gov/whatwestudy/topics/cellphones/index.html.

[51] https://pubmed.ncbi.nlm.nih.gov/29530389/.

[52] https://ehtrust.org/worlds-largest-animal-study-on-cell-tower-radiation-confirms-cancer-link/.

Federal Agencies Creating Barriers For Relief For The EMS Disabled

The U.S. Department of Housing and Urban Development (HUD) has issued guidance to its agency not to recognize any EMS claims.[53] This has created bias within the agency and other agencies:

> "The Department of Energy and Department of Justice have also received numerous complaints dealing with these issues and have informed HUD that they will not open investigations under Section 504 based on these allegations. Based on advice from HUD's Office of General Counsel, FHEO will not accept as jurisdictional allegations dealing with Smart Meters, RF and/or EMF issues, and any complaints already accepted will be closed… HUD reimburses only for cases that are jurisdictional under the federal Fair Housing Act. Where such complaints are accepted by a FHAP, they will not be accepted by HUD for payment. "[54]

The FCC has continued, unabated, to deploy 5G and other wireless technologies, despite the known dangers of wireless radiation and despite recent court rulings against the FCC. The FCC's claim of pre-emption on radiofrequency emissions has fueled the unfettered deployment of wireless infrastructure, the exacerbation of adverse health impacts on the EMS disabled, and the continued bias against the EMS disabled.

Would you board a plane whose safety guidelines have not been updated since 1996?

- In 2019, the Court of Appeals for the D.C. Circuit ruled against the FCC's failure to engage in environmental review of small cell deployment. To date, there has been no environmental review of small cells in general or 5G in particular, yet 5G is being deployed unabated. There has been no safety testing of 5G, as Senator Blumenthal established during Senate testimony by telecommunications executives in 2019.[55]
  The FCC has declined to update its wireless "safety" emission guidelines since 1996, and in 2019 decided that the guidelines did not need to be updated.
- The FCC received 11,000 pages of scientific studies of proven wireless harms and hundreds of people reporting their injuries from wireless radiation. The FCC ignored all of those submissions.
- After the FCC ignored those submissions, in August 2021, the Court of Appeals for the D.C. Circuit again ruled against the FCC and remanded its wireless emission guidelines back to the FCC for reconsideration. It called out the FCC for "its complete failure to respond to comments concerning environmental harm caused by" wireless radiation below the current FCC guidelines. The FCC has so far ignored the Court's remand order.
- Despite these two court decisions, the FCC's Technical Advisory Council (TAC) continues to discuss the unfettered deployment of wireless technologies. Indeed, there is a scheduled June 9, 2022 meeting of TAC to discuss "6G, artificial intelligence, advanced spectrum sharing technologies, and emerging wireless technologies, including new tools to restore Internet access during shutdowns

[53] Maine Human Rights Commission, April 25, 2017.

[54] Letter addressed to "Fair Housing Enforcement Partners" by Joseph A. Pelletier, Director, Fair Housing Assistance Program, U.S. Dept. of Housing and Urban Development; obtained from Maine Human Rights Commission, 2017.

[55] https://mdsafetech.org/2019/02/13/no-research-on-5g-safety-senator-blumenthal-question-answered/.

> and other disruptions." Those serving on TAC are mostly from the telecommunications industry. There is no representation for the EMS disabled or for any of the grassroots organizations or non-profits representing the interests of the EMS disabled.

The New Hampshire Commission examining EMF health effects extended an invitation to provide comment or participate. It went unanswered. The New Hampshire Commission concluded.

> ***"The FCC, using the science that they receive from other agencies and scientific/engineering associations, has set the allowable power intensity that can be emitted from these antennae. Testimony shows these limits are set well above many other industrialized nations. There are concerns by many Washington, DC watchers that the FCC is a captive agency whose Commission members come from the industry they are overseeing."***

It was recently announced that the FCC is considering deploying Wi-Fi in school buses.[56] No accommodation is being contemplated for EMS disabled children who will have no other safe school transportation alternative.

Energy Consumption and Pollution from Wireless Infrastructure and Devices

Another objective of the Justice40 Initiative is clean energy. Wireless is not clean energy.

What is emitted from wireless infrastructure, cell towers and cell phones is referred to as wireless radio-frequency radiation (RFR), electro-magnetic radiation (EMR), electro-magnetic fields (EMF), microwave radiation or wireless radiation. "ElectroSmog refers to all man-made electromagnetic radiation created and present in our surrounding environment."[57]

The environmental footprint of wireless infrastructure contributes more to global warming than it does in preventing it.[58] Wireless is not so "green."[59] As far back as 2013, it was predicted that the "wireless cloud" would produce "an increase in carbon footprint from 6 megatonnes of CO2 in 2012 to up to 30 megatonnes of CO2 in 2015, the equivalent of adding 4.9 million cars to the roads," with up to 90% of this consumption "attributable to wireless access network technologies … ."[60] More recently, energy consumption for wireless infrastructure has been reported at ten times that of fiber optics (with 5G requiring 2 to 3.5 times the energy needed for 4G towers).[61] Energy consumption from 5G "is expected to increase 61x between

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[56] "FCC Chairwoman Rosenworcel Pushes for E-Rate Funding of School Bus Wi-Fi," May 11, 2022, https://stnonline.com/news/fcc-chairwoman-rosenworcel-pushes-for-e-rate-funding-of-school-bus-wi-fi/.

[57] http://www.emfrf.com/electrosmog/.

[58] https://ehtrust.org/wp-content/uploads/5G-and-Climate-Change-Flyer-EHT.pdf.

[59] Environmental Health Trust, "5G is Not So Green …" https://myemail.constantcontact.com/Studies-Confirm-5G-4G-Will-Increase-Radiation-Exposure.html?soid=1116515520935&aid=2ptEVCn03-U.

[60] https://ehtrust.org/wp-content/uploads/5G-and-Climate-Change-Flyer-EHT.pdf.

[61] https://www.emfacts.com/2020/09/5g-base-stations-use-up-to-three-and-a-half-times-more-energy-than-4g-infrastructure/.

2020 to 2030 due to the energy demands of powerful network elements like massive MIMO[62] and edge servers [and] the proliferation of 5G cell sites …"[63]

In terms of pollution, even the telecommunications industry has referred to wireless as a pollutant in their product protection plans for which they disclaim liability for personal injury. For example, an industry brochure for consumers for cell phone insurance protection states:

> ***"Pollutants means any … gaseous, or thermal irritant or contaminant including … artificially produced electric fields, magnetic field, electromagnetic field, sound waves, microwaves and all artificially produced ionizing or non-ionizing radiation ..."***[64]

Similar definitions for pollution are in the product protection plans for other telecommunications companies.[65]

Two of the largest insurance companies in the world (i.e., Lloyd's of London and Swiss Re) have declined to insure telecom companies for any liability for personal injury that results from RFR exposures.[66, 67, 68] Insurance companies, reviewing potential RFR injuries to the public from a risk analysis perspective, have assessed RFR as "high" risk and is, therefore, excluded from coverage as a general matter. The insurance industry clearly acknowledges the high potential of claims of RFR injuries from the public arising from RFR exposure.

Minority and rural communities have historically been affected by environmental hazards. Those mistakes should not be amplified by their exposure to wireless RFR in close proximity to their homes, schools and businesses. Fiber optics to the premises (FTTP) is the superior choice for these communities, where digital inclusion and environmental equity are needed to bridge the digital divide. Fiber optics has "[l]ower energy consumption, reduced waste and sustainable architecture, characteristics that make fiber infrastructure an environmentally advantageous choice."[69] "Fiber has a minimal ecological impact, reduces waste, consumes very little energy and helps decrease greenhouse gas emissions."[70]

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[62] MIMO means Multiple-Input Multiple-Output and "is a wireless technology that uses multiple transmitters and receivers to transfer more data at the same time" by combining "data streams arriving from different paths" in contrast to Single-Input Single-Output (SISO) technology which "can only send or receive one spatial stream at a time." See, https://www.intel.com/content/www/us/en/support/articles/000005714/wireless/legacy-intel-wireless-products.html.

[63] https://ehtrust.org/report-5g-to-increase-energy-consumption-by-61-times/.

[64] https://ehtrust.org/wp-content/uploads/device-protection-brochure-nationwide.pdf.

[65] https://ehtrust.org/key-issues/electromagnetic-field-insurance-policy-exclusions/; , https://ehtrust.org/wp-content/uploads/ATT-Multi-Device-Protection-Pack-Insurance.pdf, https://ehtrust.org/wp-content/uploads/Sprint-Insurance-Terms-and-Conditions-Downloaded-2019.pdf.

[66] https://5gtechnologynews.com/insurance-companies-can-refuse-claims-related-to-electromagnetic-radiation-illnesses/.

[67] https://ehtrust.org/wp-content/uploads/Swiss-Re-SONAR-Publication-2019-excerpt-1.pdf, pg. 29.

[68] https://ehtrust.org/key-issues/reports-white-papers-insurance-industry.

[69] https://www.cablinginstall.com/cable/fiber/article/16465844/how-fiber-can-help-make-your-network-greener.

[70] Fiber Optic Broadband, A Greener Internet Solution, https://www.otelco.com/a-greener-internet-solution/.

The Need to Accommodate Disadvantaged Communities of EMS Disabled, Metrics and Guidelines

The EMS disabled is a disadvantaged community that requires affirmance and accommodation. The Fair Housing Act ("FHA")[71] and Americans with Disabilities Act ("ADA")[72] require accommodations relating to a "physical or mental impairment" that "substantially limits one or more of the major life activities." See, e.g., 42 U.S.C. §12102(1)(A) and 28 C.F.R. §36.105.

Residents in disadvantaged communities must be given the right to be heard and to choose the method of broadband access (wired or wireless), by providing them with sufficient notice and the power to consent to wired or wireless access, particularly given the proven hazardous nature of wireless technology. Appropriate accommodation must be made for those who are disabled or suffering from wireless radiation. Residents should have veto power over any wireless infrastructure in their neighborhoods or at least those right outside their homes or bedrooms, especially given that insurance companies will not insure for any injuries from wireless radiation.

The perspective of those EMS disabled as stakeholders who are suffering or disabled from wireless radiation is particularly important in establishing digital equity and inclusion, and the EMS disabled should be given a voice. This would ensure that those otherwise suffering or disabled from wireless radiation are given accommodation by (1) being given access to fiber, rather than wireless, to access the Internet for medical attention, education and other uses; (2) being given equal access as everyone else to the Internet and (3) ensuring a far enough distance from wireless technology with minimum setbacks of 500 meters, or any greater amount of setback or relocation of wireless technology that the disabled require to live safely within their homes.

Making accommodation for the EMS disabled is a necessity. To ensure that the EMS disabled are included in digital equity and digital inclusion, the EMS disabled need access to broadband; otherwise, not having these minimal accommodations would totally exclude this EMS disabled population from having public access to the Internet in their home and in anchor institutions. More specific guidelines are delineated by the Building Biologists, an organization whose mission is to help create healthy homes, schools, and workplaces free of toxic hazards, including those posed by electromagnetic radiation.[73]

Accommodation in Public Anchor Institutions

Accommodation for the EMS disabled should be made in public anchor institutions, such as libraries, schools and medical facilities, so that a portion of each such institution would not expose the EMS disabled to wireless radio frequency radiation. Wi-Fi/wireless free zones, e.g., areas in a building that do not have Wi-Fi or other wireless connectivity and are free of any wireless frequency of any kind, including, but not limited to, that generated by cell phone devices or any other type of wireless transmitting or receiving devices such as smart meters. This zone would be designed to accommodate broadband and telecommunications access for the EMS disabled and to provide safe access to all anchor institutions that they use.

[71] 42 U.S.C. §3601, et seq.

[72] 42 U.S.C. §12101, et seq.

[73] https://buildingbiologyinstitute.org/.

Here are some examples of accommodations needed for the EMS disabled. The EMS disabled need landline corded phones in community anchor institutions (e.g., libraries, schools, medical facilities) and family dwellings. They cannot use or be dependent on cell phones. A portion of each community anchor institution should have accommodation for the EMS disabled so as not to expose them to wireless frequency radiation.

Accommodation for EMS disabled would include creating a Wi-Fi/wireless free zone, which would include a way to terminate all wireless transmitting signals originating from within the zone and attenuate all wireless receiving signals penetrating into the zone. Transmitting signals can be terminated with a combination of a hard wire shut-off, permanent Wi-Fi free software deactivation that does not reset itself or just by using FTTP and cabled modems / routers / computer / telecommunications equipment. Received signals can be lowered with a combination of RF attenuation building materials, equipment and products that reduce the RFR penetrating into the zone. The objective is to create an "as low as reasonably achievable" level of RFR for receiving signals.

All telecommunications access should be provided by telecommunications equipment (e.g., modems or routers) connected only by copper wire, cable or fiber optics. Any connectors for fiber optics and other hard-wired alternatives must be secured and ensure a leak-free connection. The zone would have a means to terminate all wireless transmitting signals originating from within the zone and attenuate all wireless receiving signals penetrating into the zone. Transmitting signals can be terminated with a combination of a hard wire shut-off, permanent Wi-Fi free software deactivation that does not reset itself. Alternatively, telecommunications equipment could simply be permanently connected to fiber optics or cable for an even faster, more secure and healthier experience. Received signals can be lowered with a combination of radio frequency attenuation building materials, equipment and products that reduce the radio frequency penetrating into the zone. The objective is to create an "as low as reasonably achievable" level of radio frequency receiving signals.

The zone could also be "flexible," by equipping it with an easily accessible and visible "off" switch and robust software that does not permit wireless signals and prohibits these software settings from being automatically overridden or reset. Those needing a connection for their cell phones would simply turn off their Wi-Fi and cellular connections and plug into the hardwired connections that would be made available to them at various locations within the zone, without any attenuation in service and with the possible advantage of even faster and more reliable service without expense to their health.

In order for the EMS disabled to reach these zones, any wireless frequency within these institutions would be easily attenuated by simply placing a "Signal Tamer"[74] over the wireless telecommunications equipment which significantly reduces the amount of wireless frequency emitting from that equipment without affecting wireless connectivity.

Since the EMS disabled cannot use cell phones, they would need landline corded phones in these public anchor institutions. For example, when an EMS disabled person would otherwise be required to notify a medical facility by cell phone that they are arriving for their appointment, an accommodation would simply be a buzzer at the door to announce their arrival.

[74] See a sample Signal Tamer on Amazon, with photos of how it greatly reduces wireless frequencies while the router continues to work; https://www.amazon.com/Microwave-Shielding-Headnet-Radiation-Exposure/dp/B07P3J6J9C/ref=sr_1_3?crid=133JJDZDT48I9&keywords=signal+tamer+router+shield&qid=1652294074&sprefix=signal+tamer%2Caps%2C183&sr=8-3.

Accommodation in Home Dwellings

"A man's [or woman's] home is his [her] castle." This has been a maxim for centuries and is no less relevant here. Since the proliferation of wireless infrastructure, wireless frequencies have been intruding into people's homes, without their consent, and harming them. If frequencies were not invisible, the intrusion and harm would rise to the level of the common law crime of assault and battery. Accommodation is required to ensure that those already harmed from wireless frequencies are protected from any further intrusion and harm. Indeed, these frequencies are life threatening for the EMS disabled.[75]

To that end, the EMS disabled require hard wire, either fiber optics, cable or copper wire, to the premises and hard wire, either fiber optics, cable or copper wire, through the premises. The EMS disabled require prior notice of planned nearby facilities, their consent to the placement and there must be a minimum setback of at least 500 meters so that the EMS disabled can live safely within their homes.

In addition, the EMS disabled require access to medical assistance and emergency services in case of any acts of God, access to which, incidentally, may also become interrupted with wireless infrastructure. The EMS disabled should have equal access to broadband -- a necessary service -- in a manner that does not injure them and that does not otherwise put them in harm's way. They cannot adopt a technology that is injuring them, especially when wireless technology is intruding into their homes from the outside or from within their own homes.

Accommodation for Emergencies

The EMS disabled require hardwired connections in the event of any emergency or natural disaster, such as heavy weather conditions or a tornado. An example of how fiber optics made possible the restoration of service during an emergency is in Chattanooga, TN. In November 2012, a tornado ripped through Chattanooga. Because of the fiber optics installation, the system was able to either prevent or automatically restore service from 23,000 customer outages.[76] The EMS disabled require access to services in such emergencies.

Digital discrimination cannot be remedied without digital literacy.

Digital literacy requires educating the public, businesses, schools, states, municipalities about the important of hardwired connections. Educational materials along with links to experts in this area (such as the Building Biology Institute) can provide crucial information on how to hardwire equipment, along with the health, environmental, economic, quality of communications, and security reasons for doing so. The digital literacy program should include, e.g., (1) guidance on the safe use of technology at home, school, work, medical facilities, etc; [77] (2) how to use ethernet cords, adaptors for every device in which to

[75] See the various situations of the EMS disabled provided in this paper.

[76] "Smart Grid Helps Keep Lights Burning," May 19, 2017 Editorial, Hamilton County Herald, https://www.hamiltoncountyherald.com/Story.aspx?id=8646&date=5%2F19%2F2017.

[77] Protecting Babies from EMF https://ehtrust.org/ and https://ehtrust.org/?s=baby+safe; How to Hard-Wire Schools (see, https://www.techsafeschools.org/; "Hardwire Options | TechSafe Schools" https://www.techsafeschools.org/hardwire-options.

plug the ethernet cords;[78] (3) how to use a "Signal Tamer" or its equivalent, so as not to cause electrosmog pollution in other people's spaces (similar to not polluting people's spaces with second-hand smoke); (4) how distance from any wireless device or infrastructure is their friend; (5) how to protect babies from wireless frequency radiation and (6) how to hard-wire schools so as not to expose children to wireless frequency radiation.

Historical Context

There is precedent for creating "safe zones" for the disabled. Zones would be created to reduce crime by implementing new principles of housing construction to provide for greater public surveillance rather than constructing areas that were recessed where crimes could more easily occur. This is known as "defensible space" and the architect was Oscar Newman, Director of the Institute of Planning and Housing, New York University. He advised the Department of Justice on creating defensible space. Newman and his colleagues undertook a three-year study on the effects of the physical layout of residential environments on the criminal vulnerability of inhabitants. The project involved both statistical analyses and extensive modifications to the existing plant and grounds of housing projects to test the efficacy of hypotheses. Through the creation of "safe zones," the security and safety of adjacent streets and neighborhoods benefit through a reduction in crime.

In Missouri a Travel Safe Zone (TSZ) has been implemented to improve highway safety by implementing more clearly defined roadway segments, particularly in areas where the number of fatal or disabling injury crashes exceeds a "predicted safety performance level for comparable roadways," as stated in Missouri Revised Statutes 304.590.

As a temporary solution to homelessness, the United States Interagency Council on Homelessness (USICH), the only federal agency tasked with preventing and ending homelessness, has coordinated with 19 federal agencies, state and local governments and the private sector to create "safe zones" or "sanctioned encampments." The goal is to help people stay in a safer and more sanitary environment, without the risk of being arrested or legally cited. Sometimes these settings feature sheds or other structures or provide areas for people to stay in their cars or recreational vehicles. Others simply provide places for people to sleep in their own tents or on mats. Some communities have created these environments as a voluntary option for people that would otherwise live in unsafe situations.

The need for "safe zones" in the wireless-free context are being discussed with regularity among the EMS disabled community and those who attempt to provide services for them. On May 12, 2022, the National Council on Disability (NCD) took testimony, both written and oral, from the EMS disability community. NCD is an independent federal agency charged with advising the President, Congress and other federal agencies regarding policies, programs, practices, and procedures that affect people with disabilities.

Present-Day Context

[78] "How to Hardwire a Cell Phone to Ethernet Step by Step," Environmental Health Trust https://ehtrust.org/how-to-hardwire-a-cell-phone-to-ethernet-step-by-step/; "You Can Hard Wire iPhone to the Internet With Ethernet Cable! – Tech Wellness," https://techwellness.com/blogs/expertise/hard-wire-connect-phone-tablet-laptop-internet;"EMF Medical Conference 2021 Talk: Reduce EMF in Your Home Office,"YouTube https://www.youtube.com/watch?v=FFFdfAsTks8).

To provide some context as to why such accommodations are important, here are just a few examples of people suffering from wireless radiation: a New York police lieutenant,[79] an 81-year old elderly woman who lived in New York,[80] both of whom are referenced in **Stories of the EMS Disabled** in this paper, as well as a Texas resident.[81] The police lieutenant, who was otherwise healthy before exposure to radiation from wireless transmitters placed in close range to his house, caused him to suffer heart arrhythmias and sleep deprivation. He was compelled to evacuate his own home to live elsewhere in a safer environment, while still shouldering the financial burden of a substantial mortgage on his original house.

The 81-year-old elderly woman, after wireless transmitters were placed on the rooftop of her apartment building directly over her ceiling, suffered from debilitating radiation related symptoms, including severe tinnitus, bilateral hearing loss, sleep deprivation, major headaches and persistent nausea and vomiting. She could not find refuge anywhere in her studio apartment, where she has lived for 44 years. In her own words, "It's brutal."

A Texas resident has been seeking accommodation, suffers from life-threatening EMS: swelling of vital organs (face, head and eyes), heart attack, stroke, rashes and loss of skin, extreme fatigue, internal bleeding and breathing problems.

There should be a metric to measure in EMS disabled communities, on the ground (1) the level of electrosmog generated, or that would be potentially generated, from wireless infrastructure (2) the amount of fiber optics deployed, and needed to deploy, to provide accommodation to the EMS disabled communities and (3) the extent of accommodation for those disadvantaged communities with injuries from wireless exposure. These metrics should be accessible and transparent to the public.

Adopting Tom Wheeler's "Fiber-First" Policy: Fiber Optics Broadband is a Necessity for Disadvantaged Communities and is the Best Solution to Bridge the Digital Divide

Digital inclusion and digital equity are important for disadvantaged EMS disabled communities. ***The only way that the promise of diversity and digital equity and digital inclusion can come true for EMS disabled communities is to ensure wired connection to the home and at work and ensure they can achieve exposure avoidance - the only recognized treatment/lifestyle alternative.***

Tom Wheeler, former FCC Chair, advocates a ***"fiber first"*** policy as he testified in Congress in March 2021.[82] "To prioritize symmetrical 1 gigabit capacity … is to prioritize a 'fiber first' policy. (Such a policy is consistent with the hybrid fiber-coax (HFC) strategy of cable systems' DOCSIS 4.0 and its 10 Gbps down/6 Gbps up capability.)" Wheeler stated that "[f]iber's benefits are driven by the combination of increased processing power at the ends of the fiber and the ability to handle that increasing capacity… [A]pplying increased

[79] https://childrenshealthdefense.org/wp-content/uploads/otard-amicus.pdf.

[80] Id.

[81] http://www.wirelesswatchblog.org/wp-content/uploads/2022/03/Statement-of-Physical-Disbilities-1.pdf.

[82] Tom Wheeler's Testimony to Congress, https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Witness%20Testimony_Wheeler_FC_2021.03.22.pdf.

processing to the data flowing through a conduit that itself has increasing capacity is the definition of futureproofing."

Another factor to consider for purposes of ensure digital equity and broadband inclusion is affordability, capacity and scalability to meet increasing user demands over the local network's economic life, including performance, speed, low latency, capacity and reliability. Fiber best meets these demands. Wireless is less reliable and less scalable to meet future customer demands and has higher operational expense.[83] As Tom Wheeler testified, wireless should be used only as a last resort.

Fiber broadband would provide access, adoption, affordability, digital equity and digital inclusion.

Fiber optics broadband to and through the premises is a necessity for disadvantaged communities and is the best solution to bridge the digital divide. It provides the best capacity for remote learning for children and students who are part of disadvantaged communities, and more reliable access to medical and other services for the elderly and disabled during emergencies or severe weather when wireless service is more likely to be interrupted or out of service. Fiber would also prevent the exclusion of those disabled or suffering from wireless radiation who cannot be near wireless infrastructure or wireless Internet.

Disadvantaged, unserved, and underserved communities are disproportionately affected by lack of, or insufficient access to, broadband access. Middle mile fiber optics infrastructure has been built in many areas with middle mile fiber running past rural communities without serving them, hence the "digital divide."

Fiber to and through the premises (FTTP) is the superior service for bridging the digital divide and providing appropriate accommodation for the EMS disabled, so that these communities are not left behind. Former FCC Chair Tom Wheeler called fiber "future proof," and said that wireless should be used only as a last resort, not a first resort, in his March, 2021 Congressional testimony.[84] Wheeler stated that despite approximately $40 billion of government subsidies "over the last decade," those subsidies "have failed to deliver the goal of universal access to high-speed broadband … because it failed to insist on futureproof technology, … and focused more on the companies being subsidized than the technology being used or the people who were supposed to be served."[85]

FTTP will provide the best capacity for remote learning for children and students, particularly those who are already EMS disabled, and more reliable access to medical and other services for the elderly and disabled during emergencies or severe weather when wireless service is more likely to be interrupted. FTTP will also prevent the exclusion of the EMS disabled who cannot be near wireless infrastructure or wireless Internet.

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[83] "To Reduce Network Operating Expenses, Choose FTTH," Masha Zager, July 2020, https://www.bbcmag.com/broadband-applications/to-reduce-network-operating-expenses-choose-ftth.

[84] Tom Wheeler's Testimony to Congress, https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/Witness%20Testimony_Wheeler_FC_2021.03.22.pdf.

[85] Id.

Wheeler's statements point to the fact that wireless and fiber are not equivalent broadband media – they are not substitutes; wireless is and should be a complement, not the primary access method. Fiber is "futureproof" while wireless is not. A policy paper of the National Institute for Science, Law and Public Policy, "Re-Inventing Wires: The Future of Landlines and Networks", authored by Timothy Schoechle, PhD, communications technology expert, similarly states that "[f]iber is unmatched in its speed, performance, reliability, etc. … Wireless is not a substitute for fiber." [86]

Fiber is more affordable, scalable from symmetrical (upload and download) speeds of 100 Mbps to 1Gbps to 10Gbps, has a longer life span of 25-50 years and is safer and more cybersecure, has lower operational expenses,[87] and is available at more affordable prices. By contrast, wireless typically requires equipment upgrades, constant maintenance and re-investments about every 5 years. An example of fiber deployment, consumers in Hamilton County, TN have multiple service options, which include speeds of up to 1000 Mpbs (1 Gbps). Pricing and capacity are scalable and provide for 300 Mpbs at $57.99/month and 1 Gbps at $67.99, in each instance with symmetrical speeds.[88] Wireless technology is not able to effectively compete with similar high-speed Internet, with the FCC only requiring 25 Mbps download / 3 Mbps upload speeds.[89] [90] The Fiber Broadband Association (FBA) has shown that consumers prefer the symmetrical speeds that fiber provides.[91] As the largest fiber optics trade association in the U.S. states, "If it isn't fiber, it isn't broadband."[92] The FBA also shows the superior technology of fiber in its white paper, "The Market Has Spoken."[93]

Fiber deployment has also been an economic boon to Hamilton County.[94] A study calculated the realized economic value of fiber optic infrastructure in Hamilton County and the city of Chattanooga, over about a 10-year period from 2011 to March 2020. The economic value exceeded $2.69 billion and 9,516 jobs over the study period, with the value exceeding the costs of the fiber optic project by over $2.20 billion, and about 40 percent of all jobs created. It found that about 52% of the value of the fiber infrastructure was reflected in local economic development – "over $1.4 billion in new investments, startup funding, real

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[86] "Reinventing Wires: The Future of Landlines and Networks," National Institute for Science, Law and Public Policy, authored by Timothy Schoechle, PhD; https://electromagnetichealth.org/wp-content/uploads/2018/02/ReInventing-Wires-1-25-18.pdf.

[87] https://optics.fiberbroadband.org/Full-Article/reduce-network-operating-expenses-choose-ftth.

[88] https://bestneighborhood.org/tv-and-internet-hamilton-county-tn/.

[89] https://www.allconnect.com/blog/internet-speed-classifications-what-is-fast-internet.

[90] https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2018-broadband-deployment-report.

[91] https://www.broadbandworldnews.com/document.asp?doc_id=773546.

[92] https://s3.amazonaws.com/files.fiberbroadband.org/download/3555.4237?AWSAccessKeyId=AKIAIZGD7FMLIYLBZNIA&Expires=1650065068&Signature=CfFGHmOkZaAovAfuGmXXs2hDpKo%3D.

[93] https://www.fiberbroadband.org/p/cm/ld/fid=978.

[94] "Ten Years of Fiber Optic and Smart Grid Infrastructure in Hamilton County, Tennessee," Bento J. Lobo, Ph.D., CFA First Tennessee Bank Distinguished Professor of Finance, The University of Tennessee at Chattanooga, August 31, 2020, https://www.researchgate.net/publication/352221978_Ten_Years_of_Fiber_Optic_and_Smart_Grid_Infrastructure_in_Hamilton_County_Tennessee.

estate development and payments-in-lieu of taxes." "Each county resident is estimated to have benefited by about $646 per year due to the incremental value generated by the fiber optic infrastructure."

Another example of substantial long term cost savings using fiber broadband is Chanute, KS which "operates a 10 Gbps fiber-optic broadband ring." This fiber network "connects schools and other community anchor institutions with gigabit networks … The network generates $600,000 per year for Chanute's Electric Utility … This … has demonstrated that communities can meet their own telecommunications needs with smart public investments — they did not wait for national corporations to solve their problems." City Manager J.D. Lester refers to municipal broadband as 'the great equalizer for Rural America'..."'[95]

An example of a rural area which achieved access, digital equity and digital inclusion is rural eastern Kentucky. Peoples Rural Telephone Cooperative (PRTC) completed a 100% all fiber-to-the-premises buildout in 2014, a Gigabit-capable internet available to every home and business in the counties of Jackson and Owsley, Kentucky.[96]

In light of Tom Wheeler's "fiber-first" policy and the enormous advantage fiber provides over wireless, the FCC should consider the recommendations in the policy paper "Reinventing Wires …" of the National Institute for Science, Law and Public Policy (NISLAPP), in what former President of Microsoft Canada, Frank Clegg, calls "a reasonable voice for our turbulent world."[97]

NISLAPP explains that, first, the public needs publicly-owned and controlled wired infrastructure that is inherently more future-proof, more reliable, more sustainable, more energy efficient, safer, and more essential to many other services. Wireless networks and services, compared to wired access, are inherently more complex, more costly, more unstable (subject to frequent revision and "upgrades"), and more constrained in what they can deliver.

Secondly, NISLAPP recommends preserving, renewing, or expanding the use of existing (or new) copper wiring (and rights-of-way). Thirdly, there should be a policy of resorting to wireless access only at endpoints, ***primarily for things that move,*** or in situations where wiring is not possible or practical—but not relying on wireless for basic access.

These recommendations are preferable to reliance on privatized or semi-privatized (e.g public-private partnerships) providers for Internet access, whether wired or wireless. Rather, the discussion should shift toward Internet as a basic public utility and a re-commitment to the Internet's founding principles of open networks, interoperability and equal access to all:

• High-speed optical fiber-based Internet access networks should be available to every community and every member with a direct hard-wired connection to every household and workplace.

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[95] In Kansas, Rural Chanute Built Its Own Gigabit Fiber and Wireless Network," Christopher Mitchell 10-2-21, https://ilsr.org/chanute-rural-gigabit/.

[96] https://www.soar-ky.org/prtc/.

[97]"Re-inventing Wires: The Future of Landlines and Networks," by Timothy Schoechle, PhD, Timothy Schoechle, PhD, Senior Research Fellow, National Institute for Science, Law & Public Policy (NISLAPP), https://gettingsmarteraboutthesmartgrid.org/pdf/Wires.pdf.

• The Internet has become a basic public good vital to our society (a public commons), and it should be available to all in a safe, reliable, fair, affordable, and energy-efficient manner.
• Wireless access service is not an adequate substitute for wires and should be considered only as an adjunct or complement to wired access service.
• Thus, in principle, community networks should be financed, constructed, and managed in a manner analogous to such public infrastructure as municipal water systems, sewers, streets, or libraries.

CONCLUSION

The disadvantaged communities include the EMS disabled who need accommodation.

Therefore, a major metric to measure compliance with President Biden's Justice40 Initiative, is measurement of EMS disadvantaged communities, on the ground: (1) the level of electrosmog generated, or that would be potentially generated, from wireless infrastructure (2) the amount of fiber optics deployed, and needed to deploy, to provide accommodation to the EMS disabled communities and to achieve the Initiative's goal of clean energy for these disadvantaged communities and (3) the extent of accommodation for those disadvantaged communities with injuries from wireless exposure. Fiber optics deployment for FTTP would ensure the best connectivity, digital inclusion, environmental equity, as well as safety for the environment and for the health of the communities. These metrics would help "to deliver at least 40 percent of the overall benefits from Federal investments in climate and clean energy to disadvantaged communities."

As Chair Brenda Mallory of the White House Council on Environmental Quality has stated, the goal to "help Federal agencies ensure that the benefits of the nation's climate, clean energy, and environmental programs are finally reaching the communities that have been left out and left behind for far too long."[98] The EMS disabled "have been left out and left behind for far too long." Now with the Justice40 Initiative, the FCC has the opportunity to rectify this inequality for the disadvantaged communities of the EMS disabled. It can serve a significant role by prioritizing fiber as the access method of choice, and encouraging the development of RF-free zones in public areas and near residences so the EMS disabled can once again have a safe home environment and rejoin the rest of society.

[98] https://www.whitehouse.gov/ceq/news-updates/2022/02/18/ceq-publishes-draft-climate-and-economic-justice-screening-tool-key-component-in-the-implementation-of-president-bidens-justice40-initiative/.

Addendum: Stories of The EMS Disabled

In Their Own Words

GEORGE S., NEW YORK CITY

George S. was a healthy New York/New Jersey Port Authority Police Lieutenant with a good job, good health, and a three-story house in Astoria, Queens in New York City. George purchased the home in 2013 and refurbished it. He moved in a year later and in 2020 is younger sister, 31 years old, moved into the third story of the house. George was on the second floor. He had tenants on the first floor.

In September 2020, George returned from Europe where his father just had a quadruple bypass. He had been caring for him for five weeks. In his front yard was a cell tower. He doesn't know if you'd call it a small cell or a macro tower. He doesn't really know the difference. But it was a 35' to 40' tall tower with a canister on top that appeared to be omnidirectional and two antennas facing in opposite directions but seeming to cover almost 360° at a slightly lower level than the canister itself. George's front yard lined up perfectly with the 1000-unit apartment building across the street which was probably the target of the wireless carrier. He had received no notice, no warning. He simply came back to find what appeared to be a multidirectional antenna on a big pole had placed atop the old utility pole that was a fixture in the easement of his yard.

George's sister had just completed seven months of chemotherapy at Sloan-Kettering when the antenna was installed. She had been diagnosed with non-Hodgkin's Lymphoma, a type of cancer that affects the lymphatic system.

Even though her chemotherapy was behind her, George's sister started experiencing headaches and nausea after the cell tower was installed. She told her doctor about the new tower and the doctor cautioned that RF radiation could aggravate her condition. The oncologist advised that it was essential she avoid all radiation including RF (wireless) radiation during treatment.

George, for the first time in his life, started suffering from heart arrhythmias and sleep deprivation. He went to a cardiologist for an evaluation and was fitted with a halter containing a cardiac monitor to wear for two weeks. The results showed multiple arrhythmias. They were PVCs or premature ventricular contractions. These are the most common of the irregular heart rhythms. The heartbeat is created by electrical signals that originate in cells in the hearts upper chamber, the right atrium. That electrical signal moves down through the heart to the lower chambers where the electrical current arrives in the ventricles, causing them to contract and pump oxygen-rich blood out to the body. For George this meant that a critical heartbeat came too early, disrupting the heart normal rhythm.

The sudden onset and the severity of the arrhythmia caused George's new cardiologist to suggest an invasive procedure where they placed a catheter through an artery into George's heart. The doctor tried to replicate the arrhythmia to see if they could perform a cardiac ablation to stop the electrical charge between heart chambers. Ablation is a procedure in a small area of the heart tissue that is causing rapid and irregular heartbeats. Yet the doctor, to his surprise, was not able to replicate arrhythmia.

George did not have arrhythmia when outside of his home environment, only when in his house. The arrhythmia returned when George returned from the hospital procedure to his home. The doctor then did a second procedure to perform a cardiac ablation, but again, they found nothing wrong.

Increasingly, the level of radiation in the home was beginning to look like the culprit. In addition to the never before experienced cardiac arrhythmia, George had experienced headaches, lack of mental clarity, and insomnia that had come out of nowhere, noticeable when he first returned from caring for his father in September 2020. George had never even considered that cell towers could trigger symptoms. He used the technology and he liked it. He wasn't prone to conspiracy theories. He was a Police Lieutenant. and he relied on facts.

George decided to try an experiment. Even though his girlfriend rented one room in NYC, he started staying over there just to see if he slept better. There was a noticeable difference in all his symptoms. The symptoms simply did not occur away from home. In part to address his symptoms and part to protect his sister, George and his sister moved out of the house. He was living in a rented home, all the while paying a significant mortgage on the home he owned – the one with the cell tower in the front yard. George had bought the house across from the East River with every bit of savings he had from over 20 years of extremely hard work. He redid the house from top to bottom. He created four apartments in one three-story home and had a plan mapped out for his financial future. Then the cell tower came.

"They should have safe zones," explains George. "They should have a buffer zone from houses. What's fair is fair. We should have input on where these towers go. I came back to find my sister sicker than when I had left, and everybody I called at the city was either abrasive or they didn't have any information or they didn't know anything. The lack of empathy and the lack of control – like all of our freedoms are taken away with these towers – is like nothing I've ever seen before. It doesn't make any sense."

"I've been a public servant all my life. I was a full paramedic at 19 – the youngest in New York City. A police officer at 20. I worked my way up doing every beat that you can do," says George, and then he pauses. Silence follows, and there's good reason for that somber silence as he reflects. George and his partner were working near the World Trade Center on 9/11. They ran to help and in tandem they pulled people out. George would pull a victim out and as he pulled the person to safety, his partner would run back in. Then they would switch. It was during one of those exchanges, as George was pulling another victim to safety, that his partner ran back in and then the tower collapsed. George's partner was later found in the rubble.

"I was finally a police lieutenant in charge of 300 people," George continues, "and suddenly they put this tower in my front yard and I couldn't sleep at night. I wasn't a great boss at that point because I was so sleep deprived. My heart was racing at night, and I was one of these people who believed that there was no harm from these towers. I use the technology. I like the technology. But you can't put these towers in people's yards with no notice, no negotiation, no room for compromise. Why not put the tower in the flat surface parking lot by the 1000-unit apartment complex the carrier was trying to service? I guess they liked the angle from my front yard because they probably made more money. It was a more direct line of radiation at more apartments. But I paid the price."

"I am $250,000 in debt because I took my entire life savings and put it into the house and then spent years fixing the house up and was finally able to rent out the extra apartments." George states the facts matter-of-factly, not defeated, yet clearly not knowing how he can dig out of this hole. He has an unmarketable home, and his entire life savings is serving as a base station for a wireless carrier. "I was in Europe taking care of our dad and I came home to find my sister, who was finally done with her cancer treatment, was incredibly ill for no apparent reason. Her bedroom window was parallel with the tower. The doctor said if we stayed, her cancer could come back.

George S concludes "The FCC is betraying their responsibility…The FCC is not doing their job. If I'm not doing my job, I get indicted. If the FCC doesn't do their job, nothing happens to them. Aren't they supposed to be protecting us? So what happens to them? Nothing."

LILY MARIE, HELL'S KITCHEN, NYC

Lily Marie was an 81-year-old actress, model, writer, member of the Screen Actors Guild living on the top floor of a high-rise in the West Side of Midtown Manhattan in New York City, *also known as Hell's Kitchen*. Lily Marie had been working hard since she was 17, putting herself through college working as a secretary and waitress. The breakthrough in acting in New York City came after college. She doesn't consider herself a celebrity though others would. She's walked the runway in the top designer's clothes. Her favorite was Oscar de la Renta. She sang, "did the soaps," television shows and has a list of movie credits that include The French Connection, Stiletto, A Lovely Way to Die with Kirk Douglas, and Reflections in a Golden Eye with Elizabeth Taylor and Marlon Brando. For 45 years, Lily Marie loved her apartment at the top of a NYC high-rise, and her view of the city that had brought her opportunity and an exciting career of hard work and tremendous joy.

Everything in her world changed on September 30, 2020. That was the night wireless transmitters were activated after installation on the rooftop right above Lily Marie's apartment. There was no notification to the residents. Five antennas simply appeared on the rooftop, three of them directly above her apartment. She recalls she instantly felt different, with sudden, severe headaches and a high-pitched constant tinnitus, what Lily Marie refers to as "screaming in her ears." It was worse at night. She would lie in bed, exhausted yet unable to sleep, experiencing heart palpitations, IBS (irritable bowel syndrome), diarrhea, nausea, dizziness, a feeling of electrical sensation running from her neck to her head, forgetfulness, and general cognitive dysfunction, or "brain fog." As the days went on, her symptoms worsened. She developed bilateral hearing loss, and persistent nausea and vomiting. Lily Marie experienced these symptoms 24/7 for 26 months. In her own words: "It's brutal."

Lily Marie had to evacuate her apartment of 45 years and move to a more rural setting to escape from the transmitters above her apartment, and increasingly throughout New York City. Unfortunately, there are now wireless transmitters outside of her apartment in a more rural setting that are causing similar issues, although not as severe as the 26 months of hell she experienced in the penthouse floor overlooking New York City. Lily Marie's EMS disability remains a constant. She wears protective clothing when possible and it seems to help. When explaining this syndrome of neurological symptoms she experiences to a new doctor in her new setting, that physician referred to the described symptoms and the attributions to cell towers as "a theory."

Lily Marie told the dismissive doctor he was dismissed. She now has a new physician who is aware of the neurological symptoms that can result from radiofrequency electromagnetic radiation exposure (RF-EMF). But this physician is at a loss about how to help Lily Marie.

The new managers in her current location will not making any accommodation for her EMS disability, as they know nothing about the condition. They are kind, but without the appropriate instruction for how to minimize overall Wi-Fi exposure in the new assisted living facility, they are at a loss as to how they can help. Lily Marie would love to have hard wiring in the room she now rents at an assisted living facility so she could plug in a wired computer. She wants to communicate with her friends and those she worked in the business with for decades.

The woman who used to strut Oscar de la Renta down the runway now wraps her head in a protective fabric ski cap to stop the throbbing pain and lessen the ringing in her ears.

ROGER M., LOVELAND, COLORADO

"It was a Friday afternoon when we were noticed. All the notice said was that Verizon was coming to install several small antennae on the rooftop. The workmen arrived on Monday. They came every day from 7 AM to 7 PM and worked for three or four weeks. It was more than a few antennae. They even had a crane to lift the concealment wall that shielded the wireless equipment they put literally above my head," recalls Richard M.

Richard lived on the top floor of ArtSpace, a not-for-profit four-story building. The residents were all artists of some kind. The subsidized housing provided a place to live and work at one's craft in Loveland, Colorado. A musician and composer, Roger M. had played freelance gigs along the Front Range for years. A versatile musician, Roger was known as someone who was available for touring groups who needed a backup player. He played for theater productions, cruise ships and was frequently found at his piano, writing jazz. His top floor apartment in Loveland doubled as home and studio, he had steady work performing and life was good.

Roger went from living his dream to living in his car to just trying to survive.

He is torn when apportioning blame. Roger doesn't know whether ArtSpace made a deal to lease out the rooftop of his building without seriously investigating the possible health consequences for the residents. Yet without doubt, he feels Verizon has told the residents too many carefully crafted lies to be doing anything other than purposeful concealment. And he is angry at the FCC for what Roger refers to as "gaslighting and failing to protect the public."

In the 1944 film Gaslight starring Ingrid Bergman, a husband uses deceit to convince his wife that she is delusional so he can steal from her. The term is commonly used to describe someone being manipulated into questioning their own reality, usually so it advantages the person or entity doing the manipulating.

"Verizon tells you that they are operating at just 2% of what the FCC allows," explains Roger, "at least that's what the first couple of flyers said. They had an apartment building full of sick residents and they were trying to tell us that we were fools to be concerned.

"They throw your life into chaos," Roger continues, "and amidst that chaos they deny any harm is coming from the tower. So when they told us what we were being exposed to was just a fraction of what the FCC allowed, I called the FCC. They told me the base station was well within the regulatory limits and then they quickly shifted to their default position: 'The FCC is not a health and safety agency.'

"They are playing us for fools – *both* Verizon and the FCC," says Roger, with special emphasis on the word both. "It's all smoke and mirrors. Verizon's lies wouldn't work without the FCC's and vice versa. That Verizon base station on our rooftop may be emitting 2% of what the FCC allows, but how can the FCC allow a level so high that at 2% every single person who lived in that ArtSpace building was feeling the effects either neurologically or they were sick all the time.

"My position is that the FCC should just stop talking because if their default position is they aren't a health and safety agency, what are they doing regulating the amount of radiation everybody in this country

receives? They say they rely on other agencies, like the FDA. So you go to the FDA website and they say the same thing the FCC does. They say 'no known adverse health effects.'

"It's just a scam," surmises Roger. "This is one big shell game being played by a federal agency and a wireless carrier. They are joining together to gaslight anybody who gets sick."

Verizon had begun construction on the rooftop in January 2021. The residents think the tower was activated around April but they were unsure. Many were not feeling well but were trying to write their symptoms off to other things. No one wants to lose their home. But in August it became undeniable to all that the base station on the roof was a problem. Everybody was feeling sick or suffering debilitating headaches and insomnia. By October, Roger was paying rent to house his piano and other instruments and sleeping in his car.

Yet this was Colorado and when winter came, Roger was forced to go into his savings to pay for a hotel. He was unable to find alternative housing. The waiting list for subsidized housing was years long, and he couldn't find an apartment he could afford. The man who could fit in anywhere as a musician suddenly had no place to go. He was still paying rent at ArtSpace and the hotels throughout the area were not cheap. He couldn't get out of his lease until finally, in an act of desperation or perhaps inspiration, Roger bought a meter that allowed him to do RF radiation measurements in his apartment. He videotaped the meter walking down the hallway toward his apartment. The readings were high but suddenly as he opened the apartment door, the meter jumped in multiples of 100 μW per meter squared. Then Roger walked to various well-known places in Loveland, including coffee shops where people could come and use their laptops. Nothing came close to approximating the readings in Roger's apartment. He sent the video to the management company and ArtSpace. They let him out of his lease.

Roger explains that almost everyone moved out or at least they wanted to, but the problem for all was the rents which had skyrocketed since the pandemic, and there was really no place to go. Living in subsidized housing so they could do their craft – whether it was music or painting or pottery, had been appealing. In the beginning the building had quickly filled with artist-residents. Roger had been the first to move in and that was 2015. This was his community. This was everyone's community within ArtSpace. Now, as soon as they could get out of their leases, residents were leaving for cars, relative's homes, and the few able to afford other apartments.

"I don't know a person in the whole building who wasn't affected," recalls Roger. "Those of us closer to the rooftop probably got hit the hardest. I was like a zombie. It was the lack of sleep, I'm sure, but it was the lack of clarity of thought that went above and beyond sleep deprivation.

"Friends would come over and I wouldn't say anything because I didn't want to predispose them to thinking they didn't feel well," he explains. "But every single person who came over to visit would complain of a headache and body chills. I knew it wasn't some sort of 'mass hysteria' for those of us who lived in the building. It affected every single one of our friends.

"People stopped calling for gigs because I wasn't working, I couldn't perform, I couldn't compose, I couldn't think. I was just trying to survive," Roger states, a tired bluntness in his voice.

"I didn't move out capriciously. Who wants to leave their home, their personal possessions, and for me, my love and my profession – music."

The symptoms of electrosensitivity have not left Roger, even though he improved when he moved out of ArtSpace. The brain fog is still with him, he is without savings, and without income. After sharing his story, Roger pauses and then shares one final thought.

"What I want to say to Verizon and the FCC is 'Quit lying and quit killing us.'"

THE GILARDI FAMILY, PITTSFIELD MASSACHUSETTS

It was Earth Day, 2021. Based on the children's classic *Alexander and the Terrible, Horrible, No Good, Very Bad Day,* Amelia Gilardi rewrote and retitled, for purposes of Earth Day, the story based on a challenge faced by her family and her community in which the environment plays a central role. **"**5G Earth Day Countdown: Children — Amelia's Terrible, Horrible, No Good, Very Bad Cell Tower Days" was an ode to her community and in so many ways, it spoke to a much broader audience.

My name is Amelia and I am 13 years old.

A Verizon cell tower blindsided my Pittsfield, Massachusetts neighborhood and made us sick. This is my story.

> *Last March, we were sent home from school due to the pandemic. The ice skating show that we had worked so hard practicing for was canceled. Auditions for my school musical were cancelled. My weekend nature program was cancelled. Everything was cancelled.*
>
> *Everything except the construction happening in my neighborhood.*
>
> *Trucks were rolling by our house – big ones, flatbed ones, trucks carrying other trucks. When trying to clear the corner between Plumb and Alma Street, the weight of the truck was so much it crushed the water main beneath the road. We couldn't get the car out past the repair crew and went without water for the day. No one knew why.*
>
> *Because we were home with no plan to return to school, we tried to keep busy. For Christmas, my sister and I got mountain bikes and we went riding up our street like we always did. But this time, at the top of the street, we saw parked trucks and the cleared trees. Where there was forest that was once part of the Herman Melville Farm, a land called "Arrowhead" after Melville having found them in the fields, was now a big, open clearing.*
>
> *Trees by the dozens had been chopped down and were lying on the ground. Some had been wood chipped and spread from Alma Street to the clearing. None of the neighbors waking their dogs or out for a jog or pushing their children in strollers had any idea why.*
>
> *Mom called our City Councilor and he didn't know why. He said he would call the Department of Public Works and put some calls into the city to find out. When he got back to mom, he said no one knew anything about the construction. Mom came out for a walk with us and took a photo of the trucks. She called the construction company and asked what they were doing. That is when we learned it was a cell tower*.

Amelia Gilardi is an amazing 13-year-old playing the leading teen role in a theater she never tried out for, with some adults in roles she never dreamed she would witness.

Eliminating Digital Discrimination For the EMS Disabled (Susan Foster and Odette J. Wilkins)

Amelia Gilardi is Courtney Gilardi's daughter. That explains a lot.

The startling news that a 115-foot tall, 12-antenna cell tower was being constructed in their neighborhood in the section of Pittsfield historically known as Shacktown concerned Amelia's mother, Courtney. Construction had already begun. Twenty of the 22 neighbors had not been noticed as was required by the local zoning ordinance, and none of them had been noticed within the period of time allotted for an appeal of permit approval. In the ensuing months Courtney Gilardi and her neighbors struggled to understand how this could happen without notice in their community.

After the tower was activated symptoms were, for most, immediate. Courtney dove into the research. She contacted experts around the country, in Canada and in Europe. Verizon did not inform the residents when the tower was turned on. They knew because their bodies told them. They stopped sleeping through the night if they could get to sleep at all. They were plagued with headaches, vertigo, nausea, brain fog, skin rashes and within the next 18 months there would be two diagnoses of cancer and one recurrence of cancer. Family pets would die, and even the moles did not return to family gardens as the ground started to thaw after winter had passed. Bees and other pollinators began to disappear.

Courtney Gilardi and her husband have two girls, one Courtney refers to as "my little one" for the sake of privacy, and 13-year-old Amelia who has accompanied her mother to every Pittsfield City Council and Board of Health meeting, speaking publicly each time, imploring them month after month to help them find some relief from the injurious Verizon tower. Many of the neighbors joined the fight but few made it their mission to contact experts internationally and invite them to virtual town halls to educate residents and community leaders about the health impacts associated with RF (wireless) radiation.

What sets this story apart what residents all over the country are starting to experience an intrusion of cell towers into residential neighborhoods and on school grounds at an alarming pace is the fact the Gilardis are fighting back. The relentless drumbeat by Courtney and Amelia began to include more neighbors as the months went by. Under longstanding Massachusetts law Health Boards have strong and extensive authority to require that injurious commercial operation be eliminated, so the Gilardis asked the Board to step in and provide relief. On February 2, 2022 the Pittsfield, Massachusetts Board of Health unanimously voted to require that Verizon and the landowner to appear and show cause why the Board should not issue a cease and desist order. The Board took almost two years reviewing the extensive scientific, medical and personal evidence and expressly found that the cluster of illnesses was caused by the tower's operation. The Board encouraged Verizon to work with the city and residents to reduce the impact on these families but indicated Verizon would be required to cease operations if it persisted in its position that the city was powerless to protect Pittsfield residents from harm. This is the first known cease-and-desist by a state/local Board of Health against a wireless carrier in the United States.

Verizon refused to appear or negotiate. It responded to the Board of Health's issuance of the cease-and-desist with a federal lawsuit, filed May 10, 2022, in a Massachusetts U.S. District Court. The carrier asked the court to rule that the Board is indeed powerless to protect Pittsfield residents even after an expert medical agency finding of both injury and causation. Verizon claims that state and local health authorities are completely preempted by 47 U.S.C. §332(c)(7)(B)(II), which prohibits state and local zoning authorities, from "regulat[ing] the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions." The tower looming over the Shacktown section of Pittsfield was tested and found to be within the regulatory limits set by the FCC, so Verizon contends it can operate even if the resultant emissions lead to severe injury or even death and in the face of traditional state police powers.

Courtney Gilardi has been working tirelessly to educate her own community, and simultaneously educating communities across the country, that this practice of wireless carriers bringing their cell towers into residential areas and next to schools has to stop. The fact that this tower is at least arguably within regulatory limits set by the FCC may make Verizon feel they have the upper hand, but it is clearly making a very wide swath of neighbors in the vicinity of the tower sick.

“My little one had headaches, dizziness, and felt like her head was ‘buzzy,’ explains Courtney. “She also suffered from the sensation that her skin was crawling and was itchy when she was in her room, which was on the side of the house closest to the cell tower. She complained of stomach aches and a once voracious eater and a like-clockwork sleeper could do neither. Since the tower was activated she has lost her appetite for food and complained she couldn't fall asleep. Those were never issues in the past. She also suffered with horrible nightmares. She would toss and turn and scream out. I only realized how often she did this after we moved to the cottage and she slept peacefully through the night.”

The cottage Courtney is referring to is the unheated cottage they have rented so they can escape their home which they hope and pray they can return to, but much of that depends on a federal judge’s decision. The cottage does not have hot water so Courtney and her family return to their “tower home” for a hot shower, but it is a place they can sleep through the night.

“When we would spend too much time at home, my little one would ask to leave and go to the cottage,” explains Courtney, describing how they would return to the house to get clothes, take a hot shower, and be with their toys and amenities they enjoyed and never contemplated leaving until Verizon became their unwelcome neighbor.

“She would say, “I'm ready now” and we knew despite mentally wanting to stay in her own room with her toys, ‘lovies’, fort, books and the only home she had ever known, that physically she knew her body felt better spending time in a rundown cottage where the only thing she had was a mattress on the floor and many mice for company.

At our home by the tower, she would lay down on the kitchen bench with her legs curled up to her stomach with red, puffy eyes, looking miserable, sleep deprived and not feeling herself. She would be so nauseous that she missed school, which led to her losing confidence as she felt she was falling behind in her studies,” describes the mom of two. “Despite being one of the top students in the class, she felt like she had missed so much and felt ill so often and felt that reflected in her work, that she chose to not take the 5th grade MCAS testing.”

Courtney pauses for a moment as she describes what her “little one” has gone through, and then continues. “One day, within 10 minutes of going to school, she vomited into her face mask. It wasn't the first time it would happen. She would sleep with a bucket besides her bed and both her dad and I would take turns holding her hair back.

“Amelia, at our first in person Board of Health meeting, shared what our routine was like. She reminded me that we needed to ‘show’ not ‘tell’ what life by the tower was like.” So, with her mother by her side, 13-year-old Amelia Gilardi sat behind the table testifying with her mom showing the various medications Amelia now takes, and the pan she would keep at the side of her bed when the waves of nausea were intense and sudden.

“Amelia would get dizzy. She is my ice skater and gymnast with great balance, and I would watch her walk into walls,” describes Courtney. “Sometimes she would vomit in the middle of the night and I'd hear her little voice besides me in the dark by my bedside saying, “Mama, I'm sick. I just threw up in the sink.’

“Sometimes she would get headaches. She would be dizzy. I remember her schooling from home and having missed several days and realizing that I should check in with the school nurse and tell her why. I remember wondering what she would say, and to my surprise, she actually knew about the [cell tower harms] issue and was supportive.”

“For Amelia, sleep had never come easy, but once she fell asleep, she was a sound and solid sleeper. After the tower, that wasn't the case,” Courtney explains, describing the sudden onset symptoms of classic electromagnetic sensitivity. “She not only had a hard time falling asleep and was often still up at midnight. She just couldn't stay asleep. She was up at 1:00 AM, 2:00 AM, 3:00 AM in the morning. She testified at the City Council getting as few as two to three hours of sleep a night. Often around 4:00 AM or 5:00 AM she would fall asleep, only to be woken by the alarm at 6:00 AM. She never felt or looked rested. She had dark circles under her eyes which always looked tired.

“She had headaches and would ask for Tylenol. We hardwired everything and bought her blue light glasses and tried to spend as much time away from home as possible.” Courtney describes trying to juggle their lives and adjust everything, sometimes on a daily basis. Watching her daughters’ misery was the hardest part. As she was trying to empower her neighbors she sometimes felt powerless herself. In describing Amelia’s struggle, Courtney shares, “Sometimes she would vomit, sometimes she would just retch, and watching that was even worse, because it was like something wanted to come out, but couldn't, and she couldn't get any relief. We tried Tums, papaya enzyme, chamomile, mints, ginger chews and ginger tea and a relaxing lavender spray. We tried everything, but nothing really worked besides distance, which meant leaving our home.”

When Amelia Gilardi wrote her own version of the children’s classic about Alexander’s horrible day, she ended with the following. The only factual change is that the Health Department has, indeed, sided with the Gilardis against Verizon. Now it’s up to a federal judge in a country with increasing numbers of residents extremely unhappy to have cell towers invading their neighborhoods and marking the school grounds at their children’s schools.

From Amelia:

> ***The really bad, worst, no good bad part –***
>
> *We learned that we were not the only ones harmed by cell towers. We were put in touch with Noah Davidson’s family in Sacramento California. Both their girls, like us, got sick when a 5G tower was placed outside their bedroom window. No one listened to them either.*
>
> *Mom learned about a boy, my age in Canada, also harmed by wireless radiation since he was 5 years old. They made a movie about him and others who were harmed, called Prisoners without Walls. We talked and I learned he liked the same book series. He loved playing video games. He spoke French and liked making videos.*
>
> *We started meeting families from all over with everyday kids, like us, who had been harmed from wireless radiation either from cell towers or mobile devices. Why, if so many people were being hurt from this, was no one helping them?*

So the truly bad, no good part is that the science is here but our legislators simply are not responding fast enough. Dr. Paul Heroux, Dr. Martha Herbert, Dr. Magda Havas, Dr. Cindy Russell, Dr. Sharon Goldberg, Theodora Scarato, Cecelia Doucette and many others have tried to educate Pittsfield about these issues. They have been silenced at meeting, and any letters from them or offers to present information or assist with an investigation have fallen on deaf ears.

My mom would ground me if I was told not to do something and I kept doing it over and over. I've heard my grandma say,"When we know better, we do better."

Big people, we know better. Please, do something. We never thought this could happen to us so please, don't wait until it happens to you.

I'm asking everyone who is reading this to ***advocate for cell tower setbacks away from schools and homes****. I'm asking everyone to require the FCC standards that fail to protect us from biological harm to be updated. I'm asking you restore my neighborhood to the safe, residential place it was before the tower, and I am asking for each and every person to care about the wireless safety issue.*

Our people, our pollinators and our planet depend on you.

Amelia

REVIEW ARTICLE

Self-Reporting of Symptom Development From Exposure to Radiofrequency Fields of Wireless Smart Meters in Victoria, Australia: A Case Series

Federica Lamech, MBBS

ABSTRACT

Context • In 2006, the government in the state of Victoria, Australia, mandated the rollout of smart meters in Victoria, which effectively removed a whole population's ability to avoid exposure to human-made high-frequency nonionizing radiation. This issue appears to constitute an unprecedented public health challenge for Victoria. By August 2013, 142 people had reported adverse health effects from wireless smart meters by submitting information on an Australian public Web site using its health and legal registers.

Objective • The study evaluated the information in the registers to determine the types of symptoms that Victorian residents were developing from exposure to wireless smart meters.

Design • In this case series, the registers' managers eliminated those cases that did not clearly identify the people providing information by name, surname, postal address, and/or e-mail to make sure that they were genuine registrants. Then they obtained consent from participants to have their deidentified data used to compile the data for the case series. The author later removed any individual from outside of Victoria.

Participants • The study included 92 residents of Victoria, Australia.

Outcome Measures • The author used her medical experience and judgment to group symptoms into clinically relevant clusters (eg, pain in the head was grouped with headache, tinnitus was grouped with ringing in the ears). The author stayed quite close to the wording used in the original entries. She then calculated total numbers and percentages for each symptom cluster. Percentages were rounded to the nearest whole number.

Results • The most frequently reported symptoms from exposure to smart meters were (1) insomnia, (2) headaches, (3) tinnitus, (4) fatigue, (5) cognitive disturbances, (6) dysesthesias (abnormal sensation), and (7) dizziness. The effects of these symptoms on people's lives were significant.

Conclusions • Review of some key studies, both recent and old (1971), reveals that the participants' symptoms were the same as those reported by people exposed to radiofrequency fields emitted by devices other than smart meters. Interestingly, the vast majority of Victorian cases did not state that they had been sufferers of electromagnetic hypersensitivity syndrome (EHS) prior to exposure to the wireless meters, which points to the possibility that smart meters may have unique characteristics that lower people's threshold for symptom development. (*Altern Ther Health Med.* 2014;20(6):28-39.)

Federica Lamech, MBBS, is a medical practitioner in Melbourne, Victoria, Australia.

Corresponding author: Federica Lamech, MBBS
E-mail address: lamech.federica@yahoo.com.au

The Victorian Auditor-General's November 2009 report[1] criticized the rollout of smart meters, which had commenced in 2009 under a previous government's mandate from 2006. As a result, a freshly elected Victorian Premier announced in 2010 that his government would review the program. Following a number of reports, including those by Deloitte,[2] EMC Technologies,[3] and Lockstep Consulting,[4] the new Victorian government announced on December 14, 2011, that it would continue with the program. Although the program would result in an overall net cost to consumers of $319 million dollars (NPV at

2008 values), Deloitte's analysis of the costs and benefits of the program had concluded that it made economic sense to continue given that a large portion of the costs had already been sunk into the project.[2] The rollout was scheduled to conclude by the end of 2013, but the deadline has been extended because of delays caused by technical difficulties, inaccessible sites, and customer refusals.

Issues Surrounding Rollout

After installation of wireless smart meters began, anecdotes of people developing symptoms started to be reported in mainstream media. For example, an article in the *Herald Sun* in Melbourne reported that Marc and Maureen Florio and their 4 children had left their home, claiming that they had been experiencing constant headaches and sleep deprivation since a neighbor's smart meter had been installed 3 weeks earlier.[5]

Public concerns over a number of issues with the compulsory rollout of smart meters have since intensified and multiplied. They have included (1) adverse health effects; (2) safety issues, such as a possible increased risk of house fires; (3) the incompatibility of the smart meter with existing wiring and appliances, possibly causing damage to electrical devices in the home; (4) privacy issues surrounding the collection and on-selling of vast amounts of data that reveal customers' energy usage patterns; (5) security issues, such as those inherent in any type of wireless communication (ie, a vulnerability to hacking and to cyber-attacks); (6) cost concerns; and (7) a perceived lack of democratic process because of the way in which the rollout had proceeded.[6] In response to these concerns, Energy Safe Victoria (ESV) released a report in July 2012, "Safety of Advanced Metering Infrastructure in Victoria," which stated that "smart meters are safe,"[7] notwithstanding the fact that ESV had mentioned in their draft in May 2012 that the issue of possible health effects was "beyond the detailed scope" of the report.[8]

Victoria's smart meters are electronic meters that are capable of measuring electricity consumption in 30-minute intervals and have a transmitter/antenna that is able to broadcast the collected data wirelessly to the base.[6] Victoria's smart meters also have a second internal antenna for the Home Area Network (HAN) radio, which can be turned on when requested by the customer.[3] The electronic meter is all that is needed to implement time-of-use tariffs (ie, charging different rates for electricity at different times); however, the remote-reading function means that meter readers are no longer required and that the power companies can disconnect and reconnect power remotely.[6] In effect, a smart grid, as opposed to deployment of electronic meters, constitutes the power companies' communication system. The bulk of Victoria's power distributors use wireless mesh networks that rely on the smart meters to act as relay stations, with households' data hopping unpredictably from meter to meter, thus forming a mesh.[6] Any reflective surface can cause a deviation in the transmission route of the radiofrequency signal. One distributor has deployed a WiMax network, which involves transmission from each meter directly to a collection tower in a star-like configuration.[6,9]

Smart meters do not have to be wireless. Italy has completed the largest smart meter rollout to date. Their smart meters are hard-wired and communicate over the existing power lines.[10] Other options have been proposed, such as communication via telephone lines, whereas fiber optic cabling has already been successfully deployed in other parts of the world.[11] Claims have been made that all types of electronic meters, including wired smart meters, can introduce dirty electricity (ie, high-frequency voltage transients and harmonics) along the wiring of a house, because of their switching-mode power supply, as well as back into the main powerline.[12] The function of the switching-mode power supply is to convert alternating current (AC) coming in from the power lines to direct current (DC), which is required to run the electronic meter. This process creates high frequency voltage spikes, which are emitted constantly, 24/7, and which travel along building wires and radiate outward from them. Critics claim that this dirty electricity can lead to short- and long-term, adverse health effects.[12,13]

Sources of Radiation

Electromagnetic fields (EMFs) is a broad term that encompasses both natural and human-made sources of radiation. The electromagnetic spectrum describes the continuum of different frequencies put together with the associated wavelength of each frequency.[14,15] The frequency is the number of oscillations or cycles per second, whereas wavelength describes the distance between successive peaks of a wave.[16] As a result, wavelength and frequency are inseparably intertwined: The higher the frequency, the shorter the wavelength is.[14] The electromagnetic spectrum is divided into 2 main types: (1) ionizing radiation, which comprises cosmic and gamma rays, X-rays, and ultraviolet rays; and (2) nonionizing radiation.[14,15,17]

Ionizing radiation has so much energy per quantum that it is able to break chemical bonds between molecules.[14] The negative effect on health of ionizing radiation is well recognized.[17] In this report, however, the term *radiation* will be used to describe nonionizing radiation, which does not carry sufficient energy to break molecular bonds.[14]

Nonionizing radiation includes (1) extremely low-frequency fields, such as those emitted by electrical appliances and power lines; (2) intermediate-frequency fields, such as those used in some antitheft and security systems; and (3) high-frequency radiation, which includes radiofrequency fields, such as those produced by mobile telephones, television and radio transmitters, and radar, as well as microwaves, a subset of radiofrequency radiation, which have frequencies in the 300 MHz to 300 GHz range.[16] The last are used in microwave ovens and for wireless Internet.[14,15]

These definitions are arbitrary but represent a useful way of describing different parts of the nonionizing component of the spectrum. Discussions of and research on the effects of nonionizing radiation revolve around thermal and

nonthermal effects.[17] According to the main regulatory agencies in Australia and the United States, only thermal effects are capable of affecting human health[17]; however, this article will deal exclusively with the nonthermal, or biological, effects on humans of nonionizing radiation. For this reason, the author has used the terms *radiation*, *radiofrequency*, and *microwaves* interchangeably in this article.

As societies industrialize, an unprecedented increase in the number and diversity of EMF sources occurs.[18] These sources include (1) video display units (VDUs) associated with computers and mobile phones and their base stations,[18] (2) wireless Internet, (3) digital television and radio, and—more recently—(4) wireless utility meters and their associated infrastructure. For some time, individuals have reported a variety of health problems that they relate to exposure to EMF.[18]

Electromagnetic Hypersensitivity Syndrome

Electromagnetic hypersensitivity syndrome (EHS) is characterized by a variety of nonspecific symptoms. The most common ones include dermatological symptoms—redness, tingling, and burning sensations—as well as neurasthenic and vegetative symptoms—fatigue, tiredness, concentration difficulties, dizziness, nausea, heart palpitations, and digestive disturbances.[18] This syndrome was first described by Russian researchers in the 1950s, who called it microwave sickness.[17]

Although the range of estimates of the EHS prevalence in the general population is broad, a survey of self-help groups has indicated that approximately 10% of reported cases have been considered severe.[18] The World Health Organization (WHO) has expressed a willingness to consider professional and public input on evidence supporting the inclusion of EHS into the 11th version of the International Classification of Diseases (ICD), to be released in 2015.[15] Various national governments have also recognized EHS as an emerging public problem. Sweden classifies EHS as a functional impairment,[15] whereas the Council of Europe Resolution 1815 calls for particular attention to be paid to the needs of electrosensitive people and for the introduction of special measures to protect them, including the creation of wave-free areas not covered by the wireless network.[19]

In May 2013, the author of the current study became aware that people were registering adverse health effects from smart meters on a public Web site. Two ways existed for people to register: (1) a health register and (2) a legal register. The health register requested that people send their data to a specific e-mail address if they believed that their health had been affected following installation of smart meters, asking 2 questions: (1) "Are you hypersensitive to electromagnetic radiation from sources such as smart meters and mobile phones?" and (2) "Has your health been affected following the installation of smart meters?" The legal register contained 1 similarly worded open-ended question: "Do you believe your health has been affected by the installation of smart meters?" If the answer was "yes," people were asked to state the symptoms from which they were suffering that they believed had resulted from exposure to electromagnetic radiation (EMR) that had been emitted from smart meters. The information could be submitted online or the form could be printed and filled in by hand, then sent to a designated postal address. Neither form of registration posed direct questions about types of symptoms or offered any form of tick-a-box questionnaire, thereby avoiding the suggestion of various symptoms, and both steered clear of a recruitment-style approach to the collection of information.

The author subsequently approached the managers of the Web site and the registers, and based on her status as a medical practitioner, she received permission to view people's deidentified data in both registers in hard-copy form. It was immediately apparent to the author that people from disparate parts of Victoria were listing the same or similar symptoms from exposure to smart meters. The majority of people could not possibly have known each other, and they certainly had no access to information that had been registered by others, as data sent to the registers had been kept strictly private and confidential. Because the information appeared to point to a new and ongoing public health problem for Victoria, the author decided that a case series report, based on the cases in the registers, was warranted.

METHODOLOGY

The author began by enlisting the agreement and cooperation of the managers of the public Web site and registers and by instructing them on her planned methodology. The managers were given the task of selecting appropriate cases from both their health register and legal register. The cases were included when the managers could clearly identify the person by name, surname, postal address, and/or e-mail address to make sure that they were genuine registrants. In the case of children, name and surname, together with postal address and/or e-mail address of at least 1 parent, were considered sufficient for identification of the child.

The managers then proceeded to print or photocopy each qualifying individual's entry and to deidentify each case, providing the author with each person's gender, date of birth, and the name of his or her residential suburb. The author considered these details important for statistical purposes. Children's symptoms were reported by their parents. E-mail addresses and phone numbers were hidden by the registers' managers, and the author made no attempt to contact any person to obtain additional details or ask for clarification(s). This practice was judged by the author to be appropriate, not only for the maintenance of anonymity but also because any further questioning would have had the potential to introduce biases in reporting and interfere with its spontaneous and unsolicited nature. What was not written or written clearly was simply omitted from the report. This fact must be kept in mind when reading the case series.

The Web site's managers then proceeded to seek signed written consent to use people's deidentified data to compile a report. This request was done by sending a letter to each

individual, mainly via post, but in a few cases in which postal addresses were not available, via e-mail. In the case of children, consent had to be signed by 1 of the parents. One case was drawn directly from the public side of the earlier-mentioned Web site, and for this reason, consent was not sought for that case because it was already available in the public domain. The Web site contained a significant number of publicly available cases of symptoms from smart meters; however, the chosen case was included because it was the only one that provided fully identifiable details: name, surname, residential address, and phone number. The author subsequently removed 1 case from outside the state of Victoria and 1 from a resident of New Zealand.

Of 142 fully identifiable cases before this removal, 91 consented, with the 1 additional case being in the public domain and not requiring consent. Therefore, the sample size was 92, and the author received all deidentified submissions in hard-copy form only. They were stored in her home office under lock and key. The author intends to keep all documents for a period of 5 years after publication of this article. At the end of this period, the documents will be destroyed.

For the results, the author has used her medical experience and judgment to group symptoms into clinically relevant clusters (eg, pain in the head was grouped with headache; tinnitus was grouped with ringing in the ears). The author has stayed quite close to the wording used in the original entries. Total numbers and percentages were calculated for each symptom cluster. Percentage values were rounded to the nearest whole number.

RESULTS

Of the 92 participants reporting symptoms from exposure to wireless smart meters, 87 were adults and 5 were children. Of the adults, the youngest person was 23 years of age and the oldest was 74; 55 (63%) were female and 32 (37%) were male. The children were aged 6, 10, and 14 years, with the ages of the remaining 2 children unknown. The children's group was composed of 2 females and 3 males. Therefore, for the total group, 57 (62%) were female and 35 (38%) were male.

Of all the individuals, 39 (42%) did not specify whether their symptoms were caused by their neighbors' or their own smart meters. This lack of information was not surprising, because that kind of information was not sought in either the health or the legal registers. Therefore, it is of note that a total of 53 people (58%) volunteered this data: (1) 27 (29%) claimed that their symptoms were from exposure to their neighbors' smart meters, (2) 20 (22%) thought the adverse health effects were from a smart meter at their own homes, and (3) 2 wrote that their symptoms were from both their neighbors' and their own smart meters. It is also interesting that 3 people stated that they experienced symptoms when visiting friends or relatives who had a smart meter, and 1 person became ill after exposure to a smart meter at work.

Only 7 people (8%) stated that they considered themselves to have been suffering from EHS prior to smart meter exposure. Of these, 2 felt that radiation from smart meters had aggravated their conditions. The place of residence of the person representing each case study was important, because the locations illustrate that individuals reporting symptoms were not concentrated in 1 geographical area but were from different and varied parts of metropolitan and rural Victoria. Figure 1 shows the residential locations of the current study's cases marked with red dots; 67% of the Victorians in this study lived within Melbourne's metropolitan area (ie, Melbourne's suburbs), which is shaded a darker green on the map. This correlates almost perfectly with current demographics for the state, which show more than 70% of all Victorians living in Melbourne's suburbs.

As Figure 2 shows, the most common symptoms were (1) insomnia, sleep disturbance, or sleep disruption—44 people (48%); (2) headaches, head pain, or dull head—41 people (45%); (3) tinnitus, ringing in the ears, or buzzing/noises in the ears—30 people (33%); (4) tiredness, lethargy, or fatigue, including chronic fatigue, exhaustion, or weakness—29 people (32%); and (5) cognitive disturbances, inability to concentrate or think, disorientation, or memory loss—28 people (30%). Table 1 identifies the symptoms that were experienced by participants, other than the 5 most common, with their incidence.

Figure 1. Map of Victoria and Places of Residence of the People in the Study's Cases

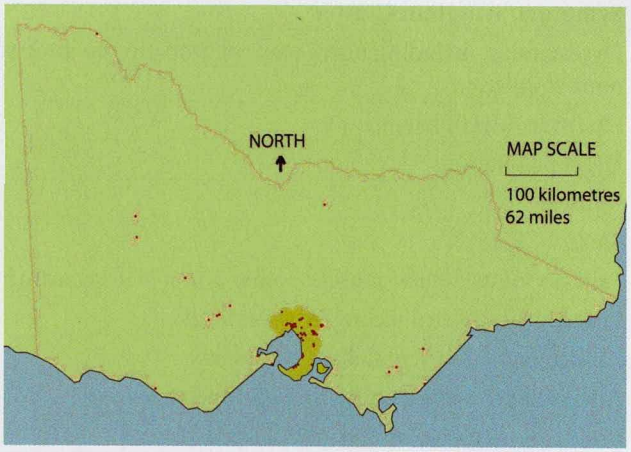


Figure 2. Five Most Common Symptoms

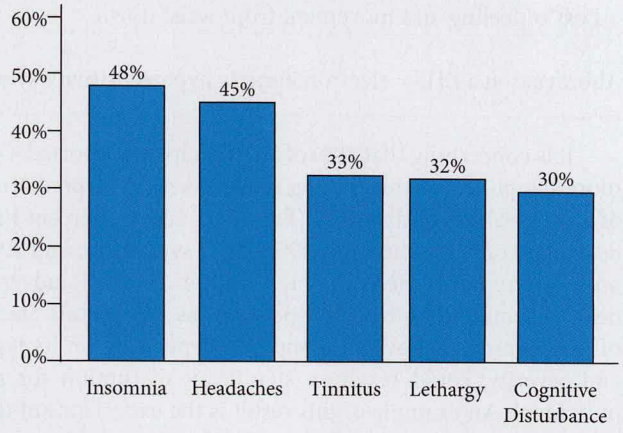


Table 1. Other Symptoms

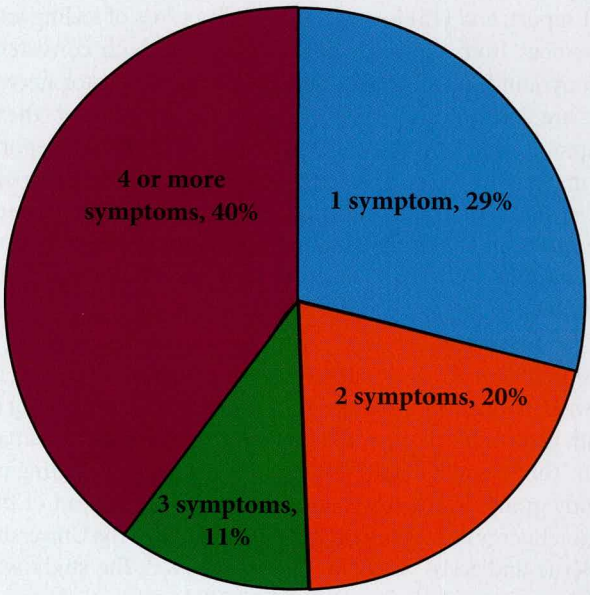
Symptom/Symptom Cluster	n (%)
Dysesthesias, including nerve pain, neuropathy, burning sensations, tremors, cold extremities, and poor circulation	20 (22%)
Dizziness/loss of balance	19 (21%)
Heart palpitations	16 (17%)
Nausea	15 (16%)
Onset of EHS	14 (15%)
Pain (in joints, bones, muscles, other and including arthritic changes)	13 (14%)
Pressure/heat/weird feeling in or on head	12 (13%)
Anxiety/agitation/irritability/restlessness	12 (13%)
Adverse health effects not otherwise specified	11 (12%)
Problems with eyes or eyesight/blurred vision	10 (11%)
Chest pain/pain in the heart	9 (10%)
Rashes/skin irritation/skin discoloration/dry skin	7 (8%)
Aggravation of pre-existing medical condition	6 (7%)
Digestive problems/bowel irritability/stomach pain	5 (5%)
Muscle spasms/cramps/twitches	5 (5%)
Nose bleeds	4 (4%)
Ear problems (ear pain, loss of hearing)	3 (3%)
Depression/loss of motivation	3 (3%)
Increased rate of infections/colds	3 (3%)
Allergies/food sensitivities	3 (3%)
Aggravation of EHS	2 (2%)
Sinus problems	2 (2%)
Lump in throat/sore throat	2 (2%)
Weight loss/loss of appetite	2 (2%)
Swollen face/lips	2 (2%)
Bladder infections/strains	2 (2%)
Flu-like symptoms	1 (1%)
Dehydration/thirst	1 (1%)
Weight gain	1 (1%)
Inability to talk	1 (1%)
Loss of motor skills	1 (1%)
Loss of feeling and movement from waist down	1 (1%)

Abbreviations: EHS = electromagnetic hypersensitivity syndrome.

It is concerning that 40% of all participants reported 4 or more symptoms, as this finding is very likely to be predictive of a greater level of disability (Figure 3). Eleven percent had developed only 3 symptoms, 20% only 2 symptoms, and 29% only 1 symptom. Note that the author counted "adverse health effect(s) not otherwise specified" as 1 symptom. She is of the opinion that even 1 symptom, depending on its type and severity, could result in significant disruption for an individual. An example of this result is the experience of the person in Case 82, an adult male who developed only 1 symptom—chronic, severe nerve pain—and had to go on a disability pension as a result.

It may reasonably be expected that a random sample of the population would also report a number of symptoms at any one time, but the difference in these cases is that all people in this study self-reported symptoms that they attributed directly to smart meters. Because EHS is a self-reported syndrome and given the current absence of a reliable assessment tool for identifying EHS in individuals, Eltiti et al[20] concluded that researchers have to rely on the

Figure 3. Number of Symptoms per Person



individual's self-diagnosis of their symptoms as caused by exposure to EMF. The researchers proposed an EHS screening tool that is centered on the fact that an individual explicitly attributes his or her symptoms to exposure to EMF-producing object(s).[20]

Similarly, a survey conducted by the Dutch Electrohypersensitivity Foundation in 2007 argues that EMF-affected individuals simply know, often by experimentation, that certain pieces of electrical equipment, installations, or facilities make them sick and that most of the problems are solved when these items are switched off or the EMF exposure is lowered by shielding or increasing the distance from a device.[21] This statement mirrors the experience of the majority of the Victorian cohort, who were specific in their description of their health problems as being directly related to smart meter exposure. A chronological relationship existed between the onset of exposure and symptom development.

A chronological relationship between length of exposure and an increase in the number or severity of symptoms, however, did not necessarily exist. This finding suggested a possible all-or-nothing mechanism, whereby smart meter exposure leads people to reach a personal threshold beyond which adverse health effects are consciously perceived. More than one-half (58%) of all the current participants also volunteered a statement with regard to the location of the smart meter(s) that they had identified as causing their symptom(s) and described clear alleviation of symptom(s) when they moved away from the smart meter(s) or when shielded from the smart meter(s).

As a consequence, a large number of people self-helped either by using shielding measures or by putting distance between themselves and the smart meter(s), which meant either relocating their bedrooms, moving to another residence, ceasing employment, restricting their movement in general, or moving out of the state of Victoria (Table 2).

Table 2. Effect on People's Lives

Effect
1. Having to go on a disability pension
2. Not being able to use part of one's house
3. Restricting freedom of movement
4. Spending a lot of money on shielding products
5. Causing financial problems
6. Causing relationship problems
7. Having to undergo otherwise unnecessary medical investigations
8. Needing to see a psychologist and doctors
9. Producing general deterioration in quality of life
10. Needing to restrict time spent using a computer
11. Needing to avoid all EMR-emitting devices
12. Being unable to drive
13. Causing secondary stress
14. Having to temporarily move out of one's home while it was being shielded
15. Developing concerns about long-term effects of exposure
16. Relocating bedroom
17. Decreased performance at work
18. Being unable to work
19. Being able to feel normal only when away from home
20. Causing several issues, such as lethargy or cognitive impairment, secondary to sleep disturbances
21. Needing to move into a caravan 25 km out of town
22. Sleeping in a van for 6 months
23. Relocating to another state

Abbreviation: EMR = electromagnetic radiation.

Figure 1 shows that people in this study were from disparate parts of the state of Victoria. They were from metropolitan as well as regional and rural areas and were not concentrated in any geographical area, which makes possible causes of symptoms related to a specific location unlikely (eg, proximity to airports, wind farms, open-cut coal mines, or chemicals used in agriculture). It is also unlikely for the reported symptoms to be associated with any seasonal factor (eg, extremes of temperatures, degree of humidity, bushfire smoke, or a high pollen count), because the reporting period stretched between September 2012 and August 2013, which meant that symptoms were reported during all 4 seasons.

Smart meters represent an ubiquitous presence throughout the state of Victoria, having been rolled out across the entire state. Their presence is not subject to seasonal variation. Therefore, they are a credible possible cause of the symptoms reported in this study, although a case series cannot prove causality. It can and does, however, offer a new hypothesis, one that will have to be tested by further research.

More than one-half (55) of all the cases did not state what effect the symptoms had had on their lives. This lack is possibly caused by the fact that the registration of their symptoms occurred in an open-ended style that did not

directly ask questions other than whether they thought that smart meters had affected their health. Moreover, participants had consented for their deidentified data to be used to compile a report at a time after their initial submission to the Web site's registers. This situation had the benefit of eliminating the likelihood of a real or perceived secondary gain for registrants but also led to the writing of short, simple statements that did not elaborate on how the symptoms had affected their lives. Table 2 provides details about the effect on the lives of the 37 people who made a statement about those effects..

DISCUSSION

Biological Effects of Radiation

With regard to the reported symptomatology related to wireless smart meters, it is interesting to look back at a research report by Dr Zorach R. Glaser for the Naval Medical Research Institute (NMRI) in the United States, completed in 1971 and revised in 1972.[22] The report lists in excess of 2300 references on the biological responses to radiofrequency and microwave radiation in its bibliography. What is immediately apparent is the fact that most of the symptoms reported in the current case series were also present in the NMRI report. This fact indicates that biological effects from nonionizing radiation are the same irrespective of the device that emits them—accounting for frequency, intensity, and duration—and that such biological effects were already known and reported to the public in 1971. In fact, Glaser mentions 2 even earlier studies that were both published in 1969.[22] The value of Glaser's report lies particularly in its lack of bias and conflict of interest because the sponsoring department was the Bureau of Medicine and Surgery (Navy) in Washington, DC.

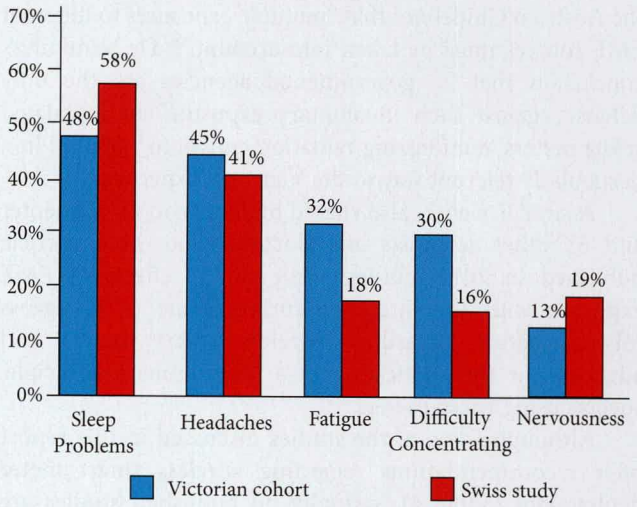
In terms of the biological symptoms listed, an almost complete overlap exists with symptoms reported in the current case series. All commonly reported symptoms in the current case series, such as insomnia, headaches, tinnitus (described as buzzing about the ears in the NMRI document), fatigue, cognitive disturbances, memory problems, dizziness, buzzing in the head, heart rate problems, eye problems, chest pain, dysesthesias, anxiety, and restlessness are very clearly biological symptoms that were listed in Glaser's report,[22] together with less common symptoms, such as heat/weird feeling in/on the head, skin problems, digestive problems, muscle cramps, sinus problems, depression, loss of appetite, and dehydration.[22]

The symptoms reported by Victorians but not mentioned in the 1971 report are (1) nausea; (2) pressure in the head; (3) pain other than head or chest pain, although the pain could be caused by changes in oxidative processes in tissues as listed by Glaser, and consequent tissue inflammation; (4) shortness of breath; (5) ear problems—pain and decreased hearing; (6) allergies and food sensitivities; (7) nose bleeds; (8) increased rate of infections/colds; (9) bladder infections/strains (10) flu-like symptoms; (11) lumps in the throat (the NMRI report instead mentions a peculiar metallic taste in the mouth); (12) swollen face or swollen lips; (13) weight gain; (14) inability to talk, which could be caused by electroencephalogram (EEG) changes and/or pyramidal tract lesions as mentioned in the 1971 report; and (15) loss of motor skills or loss of feeling and movement from the waist down, which are both consistent with pyramidal tract lesions and effects on locomotor nerves that are listed in the NMRI paper. In looking at these symptoms that were not obviously listed in the NMRI report, it is important to keep in mind that the language of that report was more technical and clinical compared with the current case series, in which the author has purposely stayed true to the wording and terms used by participants and which is, therefore, less technical and less interpretive.

In 1990, a study was commissioned in response to a petition that had been signed by a group of residents in Schwarzenburg, Switzerland, who claimed to be experiencing ill health from a shortwave-radio transmitter present in their small town. The Federal Office of Energy was charged with setting up a study group, which was chaired by Dr J. Cattin, head of the Section Energy Management, and which included the University of Berne and Swiss Telecom, among others.[23] The study was criticized, particularly because of Swiss Telecom's involvement and because of its 5-year duration, which was too short a time for any conclusive findings on long-term health effects, including cancer, to emerge.[24] It nevertheless revealed some impressive understandings on short-term effects from exposure to radiofrequency fields. The most important of these effects was that of sleep disruption, which was very common, affecting 55% of those older than 45 years, and which was directly associated with the electromagnetic-field strength of the transmitter.[23] Other symptoms reported by residents included headaches, tiredness, general weakness, irritability, nervousness, limb pain, lower-back pain, and palpitations. Most important, personality studies were carried out that showed that symptoms were not related to a health-worrying personality but displayed a dose-response relationship with logistic regression. The strong correlation between the type of symptoms experienced by the Victorian cohort and by the residents of Schwarzenburg, together with the shared high prevalence of sleep disruptions in both groups, should further inform assessment of the significance of the findings of the current case series.

A consensus paper of the Austrian Medical Association's EMF Working Group, adopted on March 3, 2012, in Vienna and titled "Guideline of the Austrian Medical Association for the Diagnosis and Treatment of EMF-related Health Problems and Illnesses (EMF Syndrome)," mentions a survey carried out in Switzerland in 2001.[25] In it, 394 respondents attributed specific health problems to EMF exposure. The following symptoms were reported: (1) sleep problems (58%), (2) headaches (41%), (3) nervousness (19%), (4) fatigue (18%), and (5) difficulty concentrating (16%). It is apparent at first glance that the first 2 symptoms are of the same order of frequency as for the Victorians in the current case series (Figure 4). A very similar percentage of people complained of headaches in both the current study (45%) and the Swiss one (41%). A similar, albeit slightly lower, number of participants reported sleep problems, such as insomnia and frequent waking, in Victoria (48%) versus those reported in the Swiss study (58%). All 5 symptoms

Figure 4. Victorian Cohort Versus Swiss Study



reported in the Swiss survey corresponded to symptoms experienced by the Victorian cohort, with fatigue (32%) and difficulty concentrating (30%) being more common in Victoria and nervousness (anxiety/agitation) (13%) being less common.

The Austrian Guidelines also list a number of what their authors consider to be EMF-related symptoms: sleep problems, fatigue, exhaustion, lack of energy, restlessness, heart palpitations, muscle and joint pain, headaches, depression, difficulty concentrating, forgetfulness, anxiety, urinary urgency, anomia, dizziness, tinnitus, and a sensation of pressure in the head and the ears.[25] All listed symptoms were experienced by Victorians in the current study, if the reader accepts that anomia corresponds with inability to talk and urinary urgency to bladder infections/strains.

Short-term effects from exposure to radiofrequency fields are also mentioned in another recent publication, the BioInitiative 2012 report prepared by 29 independent scientists and health experts from around the world. It documents bioeffects (ie, adverse health effects) and public health conclusions about effects of nonionizing radiation, including radiofrequency microwave fields. It replaces the BioInitiative 2007 report.[26] These effects involve cognition; memory and learning; behavior; reaction time; attention and concentration; and altered brainwave activity (altered EEG), as well as insomnia; discomfort; loss of well-being; sleep disruption; aberrant immune, allergic, and inflammatory responses in tissues; interference with normal cardiac function; alteration of circadian rhythms; and desynchronization of neural activity that regulates critical functions in the brain, gut, and heart. Radiofrequencies can act as disrupters of synchronized neural activity.

The BioInitiative report offers a detailed explanation on how environmental exposures to artificial EMFs can interact with fundamental biological processes in the human body.[26] This finding should not be unexpected because "human beings are bioelectrical systems."[26] In addition to short-term effects, the report dwells on the long-term sequelae (pathological conditions) from chronic exposure to nonionizing radiation, which include genotoxicity and DNA breakages among others.[26] It is not strictly within the scope of this case series to explain the biophysical mechanisms that may account for acute symptoms or effects or to discuss the long-term serious health endpoints associated with radiofrequency radiation; however, a summary of the nonthermal biological effects of nonionizing radiation is contained in Table 3. It is distilled from the BioInitiative report and intends to be a basic guide for clinicians.

It also needs to be mentioned that in 2011, the International Agency for Research on Cancer (IARC), which is part of the WHO, classified radiofrequency fields as a Group 2B Possible Human Carcinogen, based on an increased risk of glioma after 10 years or longer of cell phone use.[27] The IARC clarified that the evidence for carcinogenicity applies to exposures to radiofrequency radiation from all sources, not only cell phones (ie, it is not device-specific).[28] This finding has implications for the continued massive rollout of wireless technologies, in particular the wireless smart utility

Table 3. Summary of Biological Effects of Nonionizing Radiation

Effects

1. Pathological leakage of the blood-brain barrier, which allows toxins into brain tissues
2. Pathological leakage of the blood-gut barrier
3. Altered immune function, including increased allergic and inflammatory responses
4. Cardiovascular effects, particularly on blood pressure and heart rate
5. Disregulation of circadian rhythms and reduced melatonin production, which may account for insomnia
6. Nervous system effects, which include altered brainwave activity, changes in neuronal functioning and changes in autonomic nervous system electrophysiology
7. Desynchronization of neural activity that regulates critical functions in brain, gut, and heart
8. Lipid peroxidation of cell membranes
9. Elevated intracellular calcium with consequent disruption of cell metabolism
10. Poorly functioning mitochondria
11. Production of stress proteins as a result of the direct interaction of EMF with the DNA molecule, whereby DNA acts as a fractal antenna (because of its coiled-coil configuration)
12. Altered biochemical functions and production of hormones
13. Increased production of free radicals and deficiencies of antioxidants such as glutathione and melatonin leading to oxidative stress

Abbreviation: EMF = electromagnetic field.

meter, which was described in a recent statement to the UK Parliament as having triggered thousands of complaints of ill health and disabling symptoms worldwide.[29]

Mandated, Involuntary Exposure

With regard to smart meters, 2 unique features should be considered: (1) exposure may be involuntary and (2) exposure can be universal. In Victoria, smart meters were mandated, thereby removing the individual's choice to avoid exposure in his or her own home, and involuntary exposure also occurred to meters in neighboring homes. Each smart meter in the mesh networks transmits an unknown and variable number of burst transmissions per day, which typically reach into many thousands in number.[30] Meters on the WiMax network,[9] although not communicating with each other and deploying only bidirectional communication between a meter and the base station, nevertheless send hourly time synchronization signals in addition to their daily session transmissions.[3]

A submission by the Public Utilities Commission of California shows that only 45.3 seconds of transmissions per day (<0.1% duty cycle) still equates to 9600 transmissions.[30] Exposures are likely to be physiologically additive in nature.[25,26,31] Moreover, belief is increasing in the concept that intermittent pulses of radiofrequencies, such as those used in the smart grid, are more biologically significant compared with constant-type exposures, even when the time-averaged exposure is miniscule.[26,31] This kind of signal is biologically active and *not* invisible to the human body and its proper biological functioning, because the unpredictable pulses disrupt the synchronized biological oscillations within cells.[26] The Austrian Medical Association recommends that such periodic signals should be critically evaluated, whereas nonperiodic signals may be considered more leniently.[25]

In a 2012 memorandum titled "Health Risks Associated with SmartMeters," Dr Poki Namkung, public health officer of the County of Santa Cruz (CA, USA) stated that no scientific literature exists on the health risks of smart meters because they are a new technology.[31] This statement parallels the Austrian EMF Working Group's statement that "new technologies and applications have been introduced without certainty about their health effects."[25] Dr Namkung also explains that research on the potential health risks from radiofrequencies has been funded largely by industry because little funding is available for basic scientific research.[31]

The report indicates:

> ... exposure is additive and consumers may have already increased their exposures to radiofrequency radiation in the home through the voluntary use of wireless devices such as cell and cordless phones, personal digital assistants (PDAs), routers for internet access, home security systems, wireless baby surveillance monitors (baby monitors), and other emerging devices. It would be impossible to know how close a consumer might be to his or her limit, making safety a uncertainty if SmartMeters are mandatorily installed.[31]

Again, this statement correlates with the conclusion in the Austrian Guidelines that "multiple exposures to different EMF sources must be taken into account."[25] Dr Namkung's conclusion that "... governmental agencies are the only defense against such involuntary exposure" to mandated smart meters' nonionizing radiation emissions[31] applies in a particularly relevant way to the Victorian experience.

A similar view is also shared by Dr David O. Carpenter and 53 other scientists and doctors, who, in an article published in 2012, outline some of the effects of EMF exposure with the intent to correct some of the gross misinformation regarding wireless smart meters and advocate for the application of a precautionary principle, such as using wired meters.[32]

Although some of the studies discussed in this report offer recommendations regarding wireless smart meter deployment (Table 4), virtually no published studies are available with respect to smart meters and human health, and no long-term studies exist because of the newness of the technology.

Notably, an early voice of concern on this issue was that of Don Maisch, PhD, from Tasmania, who posed the question of whether smart meters would end up creating a public health nightmare in an article published in September 2012.[33] In it, he explained how current exposure standards are outdated and no longer relevant and warned that, given the sheer number of people exposed, simply dismissing anecdotal evidence of symptoms from smart meters as a nocebo (harmless) effect without a serious research effort would be inexcusable.

Incidence of Effects

This article has discussed the fact that people from various regional and metropolitan areas in the state of Victoria, of all ages and during all seasons, have reported symptoms from exposure to the radiofrequency fields of wireless smart meters as well as the onset or aggravation of EHS and the aggravation of pre-existing medical conditions after installation of the meters. Interestingly, only 8% of the participants in the current study stated that they had suffered from EHS prior to exposure to smart meters, which suggests that the threshold for symptom development appears to be significantly lower when it comes to wireless meters compared with that for other wireless devices.

Of an initial 142 people who had formally registered their adverse health effects from smart meters related to the current study, 92 consented to participation. The author considers this number to be significant and most likely to represent the tip of the iceberg in terms of total numbers. Underestimation could be caused by the fact that people do not associate their symptoms with smart meter exposure when the symptoms are not severe or do not occur concurrently. In addition, this underdiagnosis may be caused by a lack of knowledge about the effects of wireless technologies on the part of the general population and the majority of the medical fraternity. The ongoing campaign of

Table 4. Summary of Scientific Reports

Title	Author(s)	Country	Year	Subject Matter and Findings	Recommendations
"Bibliography of Reported Biological Phenomena and Clinical Manifestations Attributed to Microwave and Radio-frequency Radiation"	Glaser[22]	United States	1971	Provides more than 2000 references on the biological responses to radiofrequency radiation	No specific recommendation; prepared for the Naval Medical Research Institute, Bethesda, Maryland; approved for unlimited public release
"Study on Health Effects of the Shortwave Transmitter Station of Schwarzenburg, Berne, Switzerland"	Altpeter, Krebs, Pfluger, et al[23]	Switzerland	1995	Notes marked deterioration of sleep quality in persons exposed to radio transmitter	No urgent protection measures; review of current exposure guidelines; further research
"Guideline of the Austrian Medical Association for the Diagnosis and Treatment of EMF-related Health Problems and Illnesses (EMF Syndrome)"	Austrian Medical Association's EMF Working Group[25]	Austria	2012	Discusses EMF-related problems and outlines clinical-management approach	Primary method of treatment of EMF-related health problems to consist of prevention or reduction of EMF exposure
"BioInitiative 2012–A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation"	Prepared by 29 experts, edited by Sage & Carpenter[26]	Experts from more than 10 countries	2012	Reviews more than 1800 new scientific studies added to the BioInitiative Report 2007, which cited 2000 studies on adverse health effects from extremely low frequencies and radiofrequencies	New, biologically based public-exposure standard; precautionary approach to RF exposure levels
"Health Risks Associated with SmartMeters"	Namkung[31]	United States	2012	Indicates objective evidence supports EHS diagnosis; no scientific literature on health risks of smart meters	All available, peer-reviewed research data on EMF applicable to smart meters; governmental agencies to protect public health from involuntary exposure
"Smart Meters: Correcting the Gross Misinformation"	Carpenter et al[32]	Authors from a number of countries; published in Canada	2012	Summarizes long-term and short-term health effects of EMF exposure, in particular from smart meters	Application of Precautionary Principle, such as using wired meters
"Electromagnetic and Radiofrequency Fields Effect on Human Health"	Dean, Rea, Smith, Barrier (American Academy of Environmental Medicine)[17]	United States	2012	Discusses different types of radiation and effect of the increasing use of wireless technology on human health	Immediate caution on smart-meter installation; further research on effects of EMF and RF exposure; use of safer technology, including for smart meters

Abbreviations: EMF = electromagnetic field; RF = radiofrequency; EHS = electromagnetic hypersensitivity syndrome.

the state government and power distributors to portray smart meters as safe has also contributed to this lack of knowledge. Even when people believe that their new symptom(s) are caused by smart meters, some are not able to report or register their symptoms because they have no Internet access, and of those who do, not all are aware of Web sites or ways to make reports.

Limitations of Current Study

The main limitation of the current study is that, being a case series, it is a descriptive, retrospective study that does not have a control arm and can therefore help formulate a new hypothesis, but can only make limited statements on the causality of correlations observed.

Another limitation, which is specific to this type of noninterventional analysis of existing nonidentifiable data, is that the author was not able to contact individual case studies and was therefore unable to clarify or add to the information given by them. For the same reason, the author was also unable to follow up these cases longitudinally, which is something that could have potentially yielded valuable information.

CONCLUSIONS

This case series has discussed the most commonly reported symptoms from wireless smart meters. Although some of these symptoms are also reported in relationship to other environmental exposures, such as proximity to airports

or wind turbines, Victorians in this report claimed a direct chronological association between exposure to wireless smart meters and symptom development. A look at the place of residence of people reporting symptoms does not suggest a link to any possible environmental factors that are geographically specific. Seasonal factors are also excluded, because the reporting period stretched over all 4 seasons. The effect of these symptoms on people's lives is far-ranging, from stress, financial problems, and unnecessary investigations to needing to move out of one's home and even to another state.

The author of the current study offers the hypothesis that some people can develop symptoms from exposure to the radiofrequency fields of wireless smart meters. This hypothesis cannot be disproven without further assessment of the affected individuals and the electromagnetic fields in which they live. An evidence-based approach, such as the one used in all other areas of medicine, must be applied, which would mean the establishment of a postrollout surveillance study and funding for further research into the particular effects of wireless smart meters, in conjunction with research into the short-term and long-term consequences of EMR exposure. Until more knowledge is accumulated and until this type of wireless technology can be proven safe, the author believes that communities should use a cautionary approach, asking for a moratorium on deployment of wireless smart meters and smart grids and for the use of safer technologies for smart meters, such as hard-wiring, fiber optics, or other nonharmful methods of data transmission, including reading of meters by meter readers. Living in a wireless smart grid makes the Austrian Medical Association's recommendation to "take all reasonable measures to reduce exposure to electromagnetic fields" impossible to implement.

Dr Maisch's article title, "Smart Meter Health Concerns: Just a Nocebo (Harmless) Effect or an Emerging Public Health Nightmare?", resonates strongly with the Victorian experience so far. This question is very pertinent and one that must be urgently answered.

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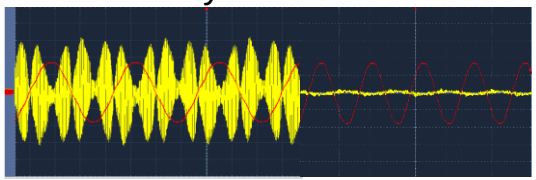
Building Biology Assessment For:

Roy Cummings

May 6, 2021

68 Merienstein Rd
Revere, PA 18953

Performed by:



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Summary

The main complaint is concern about the interaction with EMF's. especially RF Fields.

Enclosed here are the Building Biology Guidelines for a healthy home. This may help you understand some of the critical issues around your home.

IBE101_NaturalHeal
thyBuildings_v13.0.p

Here are the radiation and other biological limits based on Building Biology Institute standards.

richtwerte-SBM2015
mG Multi Color.pdf

For the concern with EMF's, I detected an issue with the Magnetic fields, power panel/sub panel configuration, Electric Fields, Dirty Electricity and Radio Frequencies:

Links and copy of files:

Please review the link below for a copy of all the files and videos recorded during this survey.
https://drive.google.com/drive/folders/1d5q7TpQ38ahsIoi-UqebzRnmwR6zCT0G?usp=sharing

Here is some information on LED lights that you may find interesting:

LED Blue Light Health Study you can still buy halogen lights which pose no threat from eBay. I highly recommend this.

https://www.jbc.org/article/S0021-9258(20)61544-7/fulltext

Action Plan

1. Shield Gutters to prevent clogging. It has already damaged the wood trim on the west side. See https://www.menards.com/main/building-materials/roofing/gutters/gutter-accessories/amerimax-hoover-dam-gutter-cover/6381/p-1545118171101-c-5812.htm?tid=-4640588255260354328&ipos=6

2. Purchase two RxDNA V2X filters and install them at the power panel. One order includes two filters, so do not place two orders.
   https://defiltersllc.com/product/rxdna-v2x-dna-filter/?v=93b46a3fc67d
3. Call the power company and get opt out gas meters. Better yet consolidate the gas meter back to one unit, the same on the water meters.
4. Call the power company and request an analog electric meter.

5. Correct the wire busses in the panel so there are not multiple bonding paths with mixed neutrals and grounds. You already have at least five I could see.
6. Install a new ground cable to a new ground rod in the front yard near the front stoop or around the back of the house near the gas meter area. Use 1/0 size cable with a plastic sheath. Do not bury the ground rod near the electric meter area this may enable the magnetic field to enter the home from the library area.
7. Use CAT 7 Shielded cable for internet connections. They come is several lengths. Here is an example https://www.amazon.com/Ethernet-AwonstieGEK-Network-Connecotrs-Router/dp/B07SNC3JXS/ref=sr_1_5?crid=25HKATUHK3IYG&keywords=cat+7+shielded+ethernet+cable&qid=1689626983&sprefix=CAT+7+Shiel%2Caps%2C130&sr=8-5
8. Use the following router for your internet. You already have a modem, leave that alone. This router allows you to turn off the wireless, has a power adjustment throttle valve allowing you to adjust max power if you decide to use the wireless feature (I use this feature myself because my wife insists on using wireless internet for her phone to check email. She is only allowed to use this in the mornings.) I have adjusted this to only 10% of max power and the wireless signal will not go past the seat she sits in. It will not enable wireless devices to work past that area of the house. It will not propagate upstairs or into our master bedroom/bathroom which is on the first floor. It also has a timer function that will work like a Christmas light switch and automatically turn off the wireless at night. https://www.electrahealth.com/JRS-Eco-100-D1-on-Asus-Low-emission-and-automatic-sleep-mode-AC1750-Router_p_207.html
9. Consider getting a Red Rose/Lipton tea bag metal canister for guest to place their cell phones in when they visit. Your guest is there to see you not spend time on their cell phone. I know this sounds harsh/crazy but they are your guests and they should respect your house rules. There over 12 detrimental effects of WIFI and Cell phones. It is detailed later in this report. I myself have/had Tinnitus very bad (Ringing in the ears). After I changed my WIFI and stopped using my cell phone in the house my Tinnitus disappeared. I have seen children with terrible ADHD and some autism functions also be mitigated. All this Wireless technology, i.e., Ring Doorbell, Apple iPads, NEST thermostats, ALEXA, Echo DOT, portable phones are severe hazards. I know you are worried about magnetic fields, but all these WIFI devices are equal threats.

10. Avoid any computer peripherals such as printers that are only WIFI enabled, get a printer that has an ethernet port. Use only wired mouse devices. Verify your PC wireless is actually off. If you want to use your phone to browse the internet your can do that with a cable adapter. If you have Google Voice, you can actually place phone calls and not rely on cell towers and WIFI, I do this all the time. See this adapter if you have an iPhone.
    https://www.amazon.com/Lightning-Ethernet-Certified-Compatible-Supports/dp/B099K2B2YJ/ref=sr_1_3?keywords=iphone+ethernet+adapter&qid=1689688607&sr=8-3
    If you have an Android phone, use this one.
    https://www.amazon.com/UtechSmart-Ethernet-Delivery-Compatible-Chromebook/dp/B07H2ZS1B5/ref=sr_1_2_sspa?keywords=iphone+ethernet+adapter&qid=1689688607&sr=8-2-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&psc=1
    There are others out there that also work, but these are examples for reference.
11. Consider Ethernet switches throughout the hose to extend wired connections. These work very well.
    https://www.amazon.com/NETGEAR-8-Port-Gigabit-Ethernet-Managed/dp/B07PLFCQVK/ref=sr_1_1_sspa?crid=3CP4TC1QFXBIG&keywords=ethernet+switch+5+port&qid=1689689434&sprefix=ethernet+switch+%2Caps%2C104&sr=8-1-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&psc=1

    https://www.amazon.com/NETGEAR-5-Port-Gigabit-Ethernet-Unmanaged/dp/B07S98YLHM/ref=sr_1_2_sspa?crid=3CP4TC1QFXBIG&keywords=ethernet+switch+5+port&qid=1689689494&sprefix=ethernet+switch+%2Caps%2C104&sr=8-2-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&psc=1
12. Since you have clear access from the basement to the main floor areas you can easily add Ethernet ports to the first-floor walls from the basement. This only requires some planning. In my home I have two Ethernet ports in each room on opposing walls so I do not have long Ethernet cables traversing the center of the room. This reduces the concern of tripping on cables.

Ground Rod Location

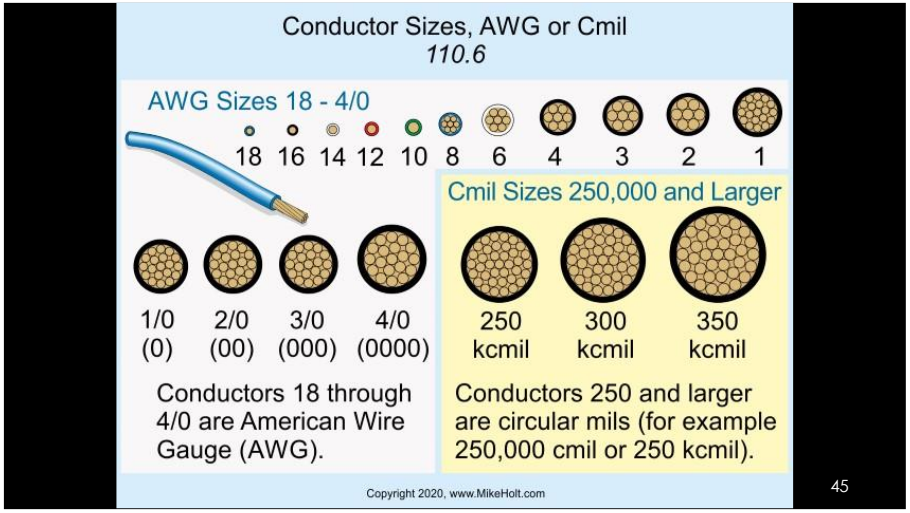
The wire running back to your electric panel from the service entrance should be a 1/0 size. Your currently have a #6 size and you should not have your ground wires connected to the city plumbing system. This is the source of your large magnetic fields in the planned master bedroom area. You currently are using the plumbing systems entrance in the basement service entrance attached to the power panel power panel. This should be a ground rod attached to the panel in a larger diameter 1/0 sheathed cable. See the included files here.

I highly advice you use jacketed neutral and ground wires and not bare copper or aluminum wire for neutrals and grounds. I have to say that the electrician that wired this panel in your home did an excellent job. Very nice and neat with the grounds not mixed with the neutrals except in a few places. Each one should have their own buss. This can be easily corrected by your electrician. The NEC code requires one connection between the ground and neutral, it is called a “Bond” but you only need just one Bond not multiple like you have now. The result is you set yourself up for recirculating stray currents which will be propagated throughout the house.

Ground Wire Size Importance

As a guide, please note the difference in wire sizes between #6 wire in your house (0.162 Inch Diameter – 0.508 circumference) and 1/0 (0.3249 Inch Diameter – 1.0207 circumference) a 200% increase in circumference. It is 400% larger in area. When increasing the size of the ground wire, you allow the ground circuit to do its job better. The concept is similar to this. If you try to push 10 gallons a minute thru a small hose it creates a back pressure upstream of the hose outlet. When you use a larger hose, the backpressure is reduced. The same is true for the electric current and RF transmission (flow). So, if the wire size is small the current trying to get out the neutral wire (white wire) back to the utility is constrained (which is typical on the utility grid). Dirty Electricity (DE) is a voltage transient at a frequency above 60 Hz. So, DE is a radio frequency (RF) signal, RF travels on the outside circumference of a wire, the larger the circumference the better able to conduct the RF of DE

to the ground source and get rid of the DE. If the ground wire is too small it cannot help, and the result is that the RF of DE is pushed back on the branch circuit neutral and ground wires throughout the house circuits. You probably do not know but there is a bond between the Neutral wire and Ground wire. That involves a dependency between the Neutral and Ground and wire sizes.

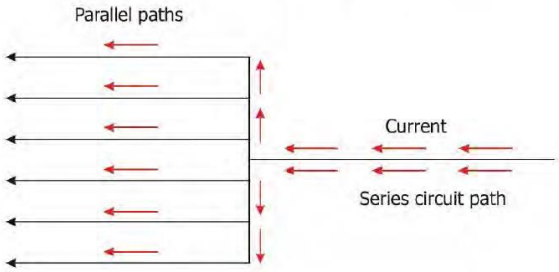


AWG	Diameter [inches]	Diameter [mm]	Area [mm²]	Resistance [Ohms / 1000 ft]	Resistance [Ohms / km]	Max Current [Amperes]	Max Frequency for 100% skin depth
0000 (4/0)	0.46	11.684	107	0.049	0.16072	302	125 Hz
000 (3/0)	0.4096	10.40384	85	0.0618	0.202704	239	160 Hz
00 (2/0)	0.3648	9.26592	67.4	0.0779	0.255512	190	200 Hz
0 (1/0)	0.3249	8.25246	53.5	0.0983	0.322424	150	250 Hz
1	0.2893	7.34822	42.4	0.1239	0.406392	119	325 Hz
2	0.2576	6.54304	33.6	0.1563	0.512664	94	410 Hz
3	0.2294	5.82676	26.7	0.197	0.64616	75	500 Hz
4	0.2043	5.18922	21.2	0.2485	0.81508	60	650 Hz
5	0.1819	4.62026	16.8	0.3133	1.027624	47	810 Hz
6	0.162	4.1148	13.3	0.3951	1.295928	37	1100 Hz
7	0.1443	3.66522	10.5	0.4982	1.634096	30	1300 Hz
8	0.1285	3.2639	8.37	0.6282	2.060496	24	1650 Hz
9	0.1144	2.90576	6.63	0.7921	2.598088	19	2050 Hz
10	0.1019	2.58826	5.26	0.9989	3.276392	15	2600 Hz
11	0.0907	2.30378	4.17	1.26	4.1328	12	3200 Hz
12	0.0808	2.05232	3.31	1.588	5.20864	9.3	4150 Hz
13	0.072	1.8288	2.62	2.003	6.56984	7.4	5300 Hz
14	0.0641	1.62814	2.08	2.525	8.282	5.9	6700 Hz

Ground Current

No ground current test was performed, since your house's ground wire is connected to the Water pipe and is not reliable or accessible. Here is an example of how this test is performed with a grounding rod. There should be ZERO amps.
Otherwise, it is judged as Nuisance Current and a violation of the NEC code. These examples are in violation of the NEC code.

Series and Parallel Paths for Current



Current will always try to return to the source

Current will return in as many paths that are available to it

Amount of current on a particular path depends on the impedance of that path

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Evaluation Parameters & General Property Observations

The property was examined for water drainage, soil preservation, slope of landscape, and plantings.

- Findings
  - The house is fitted with full 5-inch gutters and downspouts with some splash blocks. The gutters were mostly clean, not plugged and draining properly. I did detect wood rot on the trim board on the west side of the house. I believe this is a plugged gutter issue. To protect against leaves clogging the gutter **I highly recommend the following inexpensive product.** https://www.menards.com/main/building-materials/roofing/gutters/gutter-accessories/amerimax-hoover-dam-gutter-cover/6381/p-1545118171101-c-5812.htm?tid=-4640588255260354328&ipos=6
    Getting up on the high roof is dangerous so hire a professional roofer to do this work.
  - Soil was Silt Loam/Gravel with clay content. Silt Loam soil with heavy gravel content is normal for this region. In the front yard there is a full lawn with gardens and well sloped frontage. There are no apparent heavy chemicals and herbicides heavily applied to the lawn. The drainage looked in good order.
    There is no septic field nearby. The soil may be the reason the drainage at the rear patio area is well drained.

  - The property has about a 2-foot declination from the road front edge to the rear home frontage. There was adequate slope for rain drainage and there was no erosion of the soil on the steepest edges of the property. There is no hazard of lake/river flooding to the dwelling from seasonal fluctuations in water levels. There are no reverse slopes near the foundation grade except for a limited slope in one corner preventing rain water accumulation near the foundation.

  - The home has planned flower Pots/beds and where flower Pots/beds are not present there is a mature growth of grass to protect the foundation from water and weeds. There are

several mature trees with none directly abutting the foundation edges.

Construction Integrity

- Findings
  - The dwelling construction is of conventional wood frame over a cement block foundation. There is a full asphalt roof. I found no cracks in the walls or ceiling and was very sound, there were no unrepaired cracks present.
  - This is a one-story home with wood floors. It has 1207 Sq Feet.
  - Insulation of >R-19 in the ceiling. R11 in the walls.
  - The dwelling has 9 rooms in total, 2 bedrooms, master bathroom, one living room, one kitchen, kitchen dining area, one rec room (basement), and laundry downstairs. There are 1.0 baths and total house square footage is 1207 sq. ft. All utilities are in the basement.
  - The home heating is with natural gas and there is city water and municipal sewer. There is one central air conditioners. one gas meter, one water meter.
  - The front walkway and rear patio are in good condition.

HVAC Systems and air filtration

There is a central furnace with standard central natural gas and central air conditioner unit. There is a MERV 9 filter. There is an automatic humidifier system and regulation was at 29% to 36% relative humidity. Regular maintenance on the furnace is kept up to date. This furnace unit, hot water tank or gas fireplace has no lingering gas or smoke smell.

Indoor Air Quality

The home was not tested for Mold or TVOC/TMVOC content. I could not detect any strong mold odors or respiratory irritant in the home due to a lack of air circulation. Perhaps a TVOC/TMVOC test could be done in the future to identify any issue that should arise.

Note that cleaning supplies should never be stored under the kitchen sink, but should be removed and stored in the garage or backyard shed and not the basement. Remove them from the indoor environment. Perhaps you do not realize that even with the container lids closed these still outgas Volatile Organic Compounds (VOC or TMVOC) into the air potentially leading to aggravation of asthma. There was no apparent mold presence in this report.

Temperature, Relative Humidity and Dew Point

No test was performed. I would say the humidity was a normal. You should target about 39-47% Relative Humidity and a temp of 68-70 degrees I would use a simple analog monitor similar to this. I would keep an eye on this going forward using something like this to monitor the house.

https://www.weathershack.com/product/weems-plath-endurance-comfortmeters.html

You have an excellent heating system; I do not suggest any changes. In the future you may consider added air purification units, but this one is extremely good.

https://surgicallycleanair.com/product/jade/

Water Systems

The water systems were not tested during the evaluation. You have a rural/city water system. I would suggest you have an annual water quality test. I did not see a Reverse Osmosis (RO) unit in the house, perhaps I missed it but since you live near former farms you should check for arsenic in the water as the result of farm chemical usages.

Radon Testing

The home was not tested for Radon gas prior to this evaluation. You do not have a RADON venting system already. It is recommended that a test be performed every few years. Do this during the months of April or May when there is more fresh air present in the home. Look for a reading well below the maximum of 4 Picocuries. Radon test kits are readily available or free from your county health department. Ventilate your basement with box fans for 3 days before doing a test get a good air flow before the test.

AC Electric and Magnetic Fields

I did do an examination of the Electric and Magnetic fields in the bedrooms. Based on the tests conducted you do seem to have high electric fields in the home.

This home was not tested for EMFs in the past.

- I did not test for Magnetic fields due to parallel neutrals. This is usually found near the switches and outlets in the various rooms. It is usually found in wall switch plates that have multiple switches this is a wiring error due to “Net Current”. I find this defect in many homes surveyed. I did not find this test this condition at your home because of time allowed. But this should be checked. Look at this reference for doing this test yourself. You should strive for a reading of Zero current. This is a violation of NEC 300.3 (B). It is a potential fire hazard. See this refence for how to do tour own test. https://defiltersllc.com/net-current-issues/?v=93b46a3fc67d

- Here is very good book that describes this very well. If you have this problem, it must be fixed and is a potential fire hazard. I find this issue due to improperly trained electricians and I find it in almost 50% of all homes.

  https://drive.google.com/file/d/14s4qxlR-BSMbmDr7FgfEWkHpS437YLK1/view?usp=sharing

  Here is a video on the same subject.

  https://youtu.be/IAAZCMns8YM

Electrical Panel

Please note my comments that follow about your electrical system.

Main fuse box:

This neutral wire (White Stripe) has a plastic sheath or tape. Keep it away from the panel surfaces. I noted several ground wires are touching the bare neutral wires in the panel.

DC Magnetic Fields

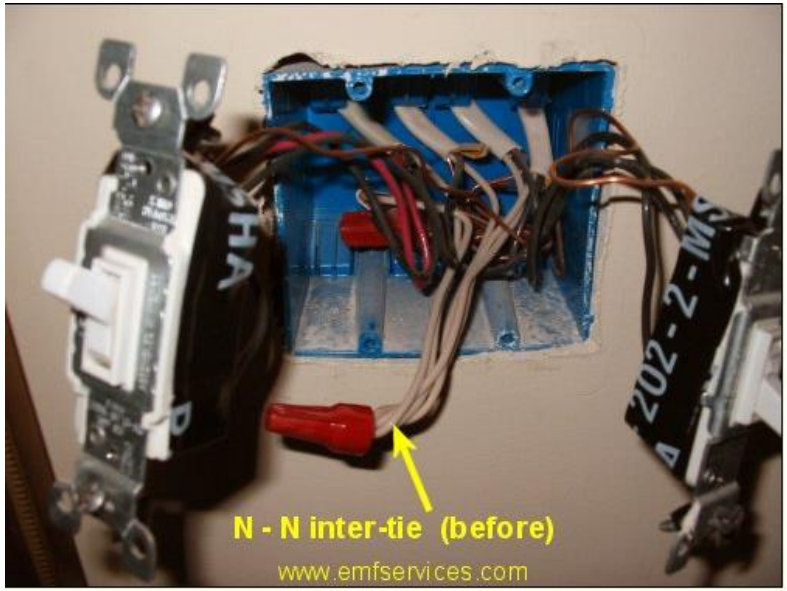
No DC Measurements were made and were not in scope or a concern.

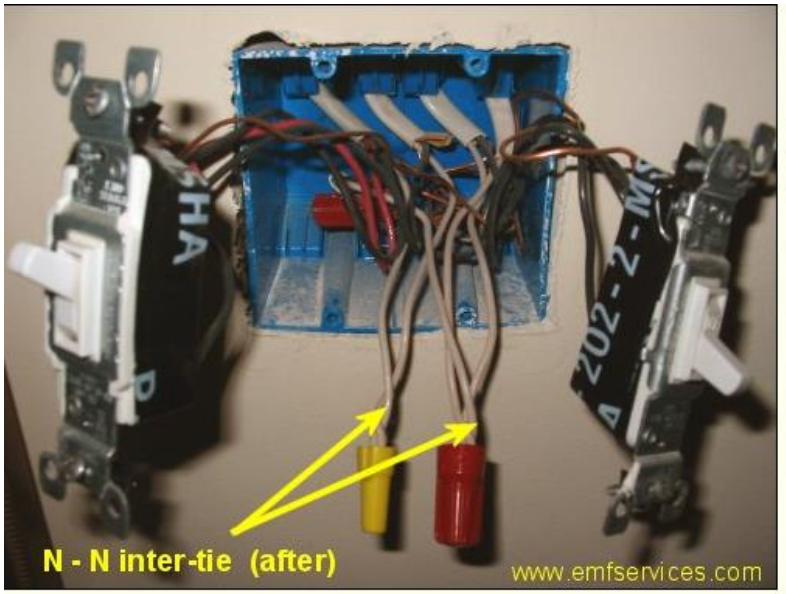
AC Wiring Details

No AC current measurements were performed. In the future, “Net Current” and ground loop effects should be checked for wiring errors in the wires and switch plates. Examples are provided, note: NEC Code Violations 300.3 (B). Look at my web site on the procedure to do your own tests. In the interest of time, I perform a test for this condition. This should be reviewed by an electrician. You clearly have an issue in the lower-level basement.

https://defiltersllc.com/net-current-issues/

Typical NEC 300.3 (B) Violations – Examples





Here is a basic explanation of how an elevated magnetic field is produced by a circuit imbalance (net current). Most of the wiring in homes and commercial buildings consists of cables containing two or more current-carrying conductors (or conduits containing multiple conductors). At any point in time, an equal current is flowing in one direction on one wire, and in the opposite direction on another wire. Since these wires are very close together inside the cable jacket or conduit, the magnetic field around one wire is cancelled by the opposite magnetic field around the other wire. The field drops to a negligible level a few inches from the wires. In this case there is no **net current** on the circuit, and a clamp-on ammeter placed around the cable or conduit will indicate zero current. A clamp on Ammeter is the most accurate tool for measuring this effect and most

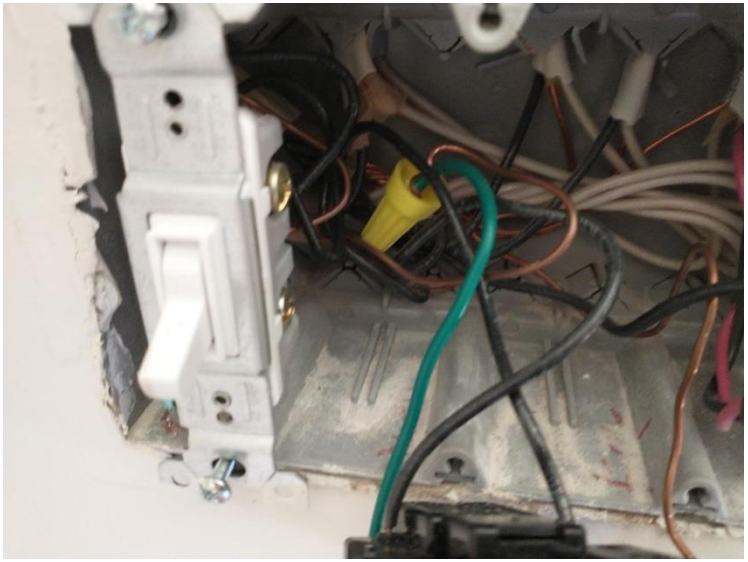
electricians use a large ammeter with inadequate resolution. You must use an Ammeter with a resolution of 0.000, not 0.0 as most electricians use. Here is a picture to illustrate this type of meter and in this example, it shows 0.026 amps of net current. This would be a violation of the NEC Code 300.3 (B)

Problems occur when this balance is destroyed by improperly wired circuits. Common examples are:

- neutrals from separate branch circuits that are connected anywhere beyond the point of origin
- neutral-ground shorts (intentional or inadvertent) anywhere in the system

- improperly wired subpanels or a (a form of N - G short), you do have this effect because of the ground loop detected.
- incorrect three-way switch wiring where the hot and neutral are fed to different points in the circuit
- In each case, a portion of the normal utilization current is caused to flow over an alternate path, creating an imbalance, or **net current**, on two or more circuits. A clamp-on ammeter placed around the cable or conduit of such a circuit will indicate a substantial current (often 0.001 to 10 Amps). It is not unusual to find multiple wiring errors in new construction, and inspections conducted by local code enforcement authorities will not detect the great majority of these problems because inspectors only check the rough in electrical, not the final inspection. Plugging in an outlet tester will not find net current.

Typical Switch Plate – There is a net current issue here where all the white wires are bundled together.



This net current effect places a Contact Current load of high frequencies and contact current onto every outlet in the house with the dirty neutral wire “pushing” the current and frequencies through the house. Especially the current, which needs to be less than 18 µAmps. When I see this type of wiring, I see greater than .002 amps (2000 µAmps) on the ground system. You definitely have this issue based on the net current tests. But it can all be corrected by fixing the wiring in the switch plates and outlets. Most electricians ignore or dismiss this concern, but the EPRI does not and in fact warns about this.

The Electrical Power Research Institute[9] (EPRI), one of America’s largest electrical research agencies (created by the electric utilities in 1973), published research in 2000 revealing that extremely low levels of contact current (~18µA) are a “potentially important exposure with respect to childhood leukemia” and have “biological effects relevant to cancer.

*…the absolute (as well as modest) level of contact current modeled (**~18µA)** produces average electric fields in tissue along its path that exceed 1 mV/m. At and above this level, the NIEHS[2] **[National Institute of Environmental Health Sciences]** Working Group [1998] accepts that **biological effects relevant to cancer** have been reported in ‘numerous well-programmed studies.’*
The effects the Working Group cites are "increased cell proliferation, disruption of signal transduction pathways, and inhibition of differentiation." The NIEHS endorses this conclusion in its final EMF RAPID report [1999][3]

Your Internet Connections

It should be at 100 µWatts/M² Maximum. Just a casual check resulted in over 1,000 µWatts/M² throughout the house from the electric meters across from the house on the neighbor's house.

You have an extreme level >1,000 µWatts/M² of WIFI from the electric meters radiating from the neighbor. You should disable all wireless in the house. You have a large number for cable TV Coax connections that can be used as a transport for internet communications via a series of MOCA adapters. This will enable you to get internet cables and eliminate WIFI.

MOCA Adapters

You can get this type of adapter called MOCA from Amazon.

https://www.amazon.com/MoCA-2-5-Gigabit-Ethernet-Ports/dp/B07Z3SB1HH/ref=asc_df_B07Z3SB1HH?tag=bngsmtphsnus-20&linkCode=df0&hvadid=79920869387753&hvnetw=s&hvqmt=e&hvbmt=be&hvdev=c&hvlocint=&hvlocphy=&hvtargid=pla-458352039738916 8&psc=1

Roll over image to zoom in

MoCA 2.5 with 2 Gigabit Ethernet Ports - Ethernet Over Coaxial Adapter (2 Pack) | Model: TL-MC84

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Brand	Translite Global
Hardware Interface	Ethernet
Compatible Devices	Smart TV, Desktop, Smartphone
Item Dimensions LxWxH	5 x 3.25 x 1.25 inches
Data Link Protocol	Ethernet, Gigabit Ethernet, MoCA 2.5
Data Transfer Rate	3 Gigabits Per Second
Item Weight	1 Pounds

About this item

- MoCA 2.5 offers actual data rates up to 2.5 Gbit/s, continues to be backward interoperable with MoCA 2.0 and MoCA 1.1, and adds MoCA protected setup (MPS), Management Proxy, Enhanced Privacy, Network wide Beacon Power, Bridge detection and TR-069 remote management.
- Flexible frequency selection: It works at high frequency range. Frequency range is between 1125~1675 MHZ. Channels can be flexibly selected based on network condition.
- Strong interference-proof capability: Physical layer adopts advanced ACMT mode that isOFDMA, which makes it to get strong interference-proof capability by avoiding high noise at lower frequency.
- Advanced data link layer agreement: Link layer adopts TDMA protocol, MP2MP structure. Each device can communicate with any other one. All the adapters adopt the same TDD.
- Absolute bandwidth supply: MOCA 2.5 adapter supports up to 3.0 Gbps throughput with low packet loss rate and low latency.

These are easy to install and if you need help with getting this done let me know. You place one unit at your router and the matching unit in the office and lower level. See the manufactures information on their web site for further details. https://transliteglobal.com/product/tl-mc84-moca-2-5-network-adaptor/

Body Voltage

I used a Gigahertz NFA 1000 meter but here is a tool you can inexpensively use on you own to detect electric fields. It is called a Body Voltage Kit, aka Model BVKc.

You can make improvements in the whole house with electric fields by using shielded power cords and shielded power strips. Also, you can replace the WIFI routers with a much friendlier WIFI function that automatically turns of when not in use. When you use an ethernet cable to a PC of another device you can use a CAT 7 shielded cable as described.

See these references for products to help you make selections.

https://www.electrahealth.com/shielded_surge_suppressor_6_outlet.html

https://www.electrahealth.com/Ultimate-Grounding-USB-to-Gigabit-Ethernet-Adapter-with-USB-Hub.html

https://www.electrahealth.com/Ethernet-grounding-adapter-kit_p_129.html

https://www.electrahealth.com/wifi_free_wired_only_router.html

https://www.electrahealth.com/ElectraHealth-Shielded-Power-Cable-Cord--Multipurpose--12-feet-long--18-AWG_p_113.html

https://www.electrahealth.com/ElectraHealth-Shielded-Extension-Cord--Heavy-Duty-Light-Almond-14-gauge_p_139.html

https://www.electrahealth.com/cat7-25ft.html

https://www.electrahealth.com/cat7-50ft.html

A Safe Router – if you really must have WIFI, this unit is the only one I know of where you can control the number and strength of the transmissions.

https://www.jrseco.com/p/jrs-eco-100-wifi-d2-on-asus/

RF Signals

I tested the RF readings near the smart meters on your neighbor's house:

These are radiating from your neighbor home into your home. Readings over 100 are considered a risk.

From my measurements your neighbors electric meter are major issues as already identified. In addition to that, be aware that in most homes WIFI is also a major issue. For you to have better health, you have to remove WIFI RF and cells phones from the environment. I know it is not easy, but you must begin the process of using **shielded** CAT 6 or CAT 7 internet wiring for all access to the internet, this includes school work. I can help you with this all you have to do is ask me.

Other interesting RF issues (though not directly related to your house)

Our schools are now flooded with WIFI. The WIFI in Schools is a particular concern. Watch this video for more information.

https://www.youtube.com/watch?v=KN7VetsCR2I

TV Station Frequencies

I did not detect any of these frequencies, but I thought you should know these do exist almost everywhere in the country.

Television Broadcast Frequencies

A television Radio Frequency (RF) channel is allocated 6 MHz of bandwidth for over-the-air transmission in the **VHF** or **UHF** frequency band. The VHF band has 12 RF channels (2-13). The band is sometimes subdivided into VHF-Lo (channels 2-6), and VHF-Hi channels 7-13). The UHF band originally had 70 RF channels (14-83). The UHF band was later reduce to 56 channels (14-69). The band was reduced again in June 2020 to 38 channels (14-51). Note, Channel 37 is reserved for radio astronomy.

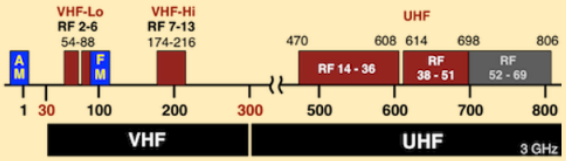
Sponsored links

TV Broadcast Bands

Band	RF Channels	Frequency
VHF-Lo	2 - 6	54 - 88 MHz
VHF-Hi	7 - 13	174 - 216 MHz
UHF	14 - 51	470 - 698 MHz

A VHF antenna will receive channels 2 - 13 (54 - 216 MHz).

Television Frequency Chart (MHz)



VHF - Very High Frequency 30 - 300 MHz
UHF - Ultra High Frequency 300 - 3000 MHz

AC “EMC” Conducted Emission on Wiring (commonly called DE – Dirty Electricity)

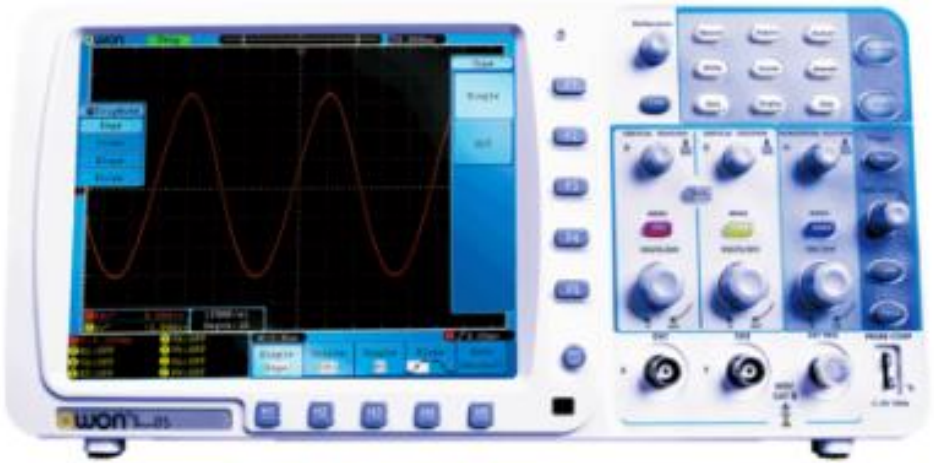
This is a little-known electrical characteristic, some call this “Dirty Electricity or DE”, building biology calls this “MEP” (Micro-Surge Electrical Pollution). However, the IEEE and the FCC call this “EMC/EMI” (Electro-Magnetic Conducted Emissions and Electro-Magnetic Interference) and there are two classes called Class A and Class B. and is also an international standard called CISPR 22. We are all talking about the same effect on the house wiring. It means there are added voltage transients above the normal 120 volts 60 Hz provided by the utility.
Here are the FCC Specifications.

module8_regulations.pdf

Conducted Emission DE – Dirty Electricity Reading

There are several instruments that can be used to evaluate the house wiring for comparison to the FCC Class A and Class B Specifications. The most useful and accurate instrument is an Oscilloscope. Otherwise, you must use an **anechoic chamber** (*an-echoic* meaning "non-reflective") is a room designed to stop reflections of either sound or electromagnetic waves. This chamber which can cost many tens of thousands to build and equip. It is not portable. When making these measurements it is extremely important to not use the AC power to drive the scope otherwise you will get a reading much higher than the actual reading. I used a PICO type of scope.

I used a PICO 2408B, this scope also running from battery sources. I used a PICO scope for the tests at your home because it is more functional than the OWON scope for our purposes.



Pico 2408B
Oscilloscope/Spectrum Analyzer

The OWON scope is excellent for analysis of power wave forms and voltage transients. The PICO scope is excellent at revealing the frequencies of the various transients and helps to identify the sources of those transients.

The OWON oscilloscope traces I am including here need a little explanation.
You will notice a line trace in RED which is the measured 120-volt AC 60 cycle.
This RED trace is the normal waveform I would expect in every building.
Notice the scale of the major division (the big black squares) is 50 Volts per division.
You will note that 120 volts is actually somewhere almost it is useful to use as a reference when comparing the YELLOW trace waveform. In this building the 60 Hz

waveform is not normal. There are some harmonics as the wave form is slightly distorted and not a uniform sinusoidal curve. There is not much that can be done regarding this situation, this is all in the control of the utility company. All the homes in the area all will have the same characteristic.

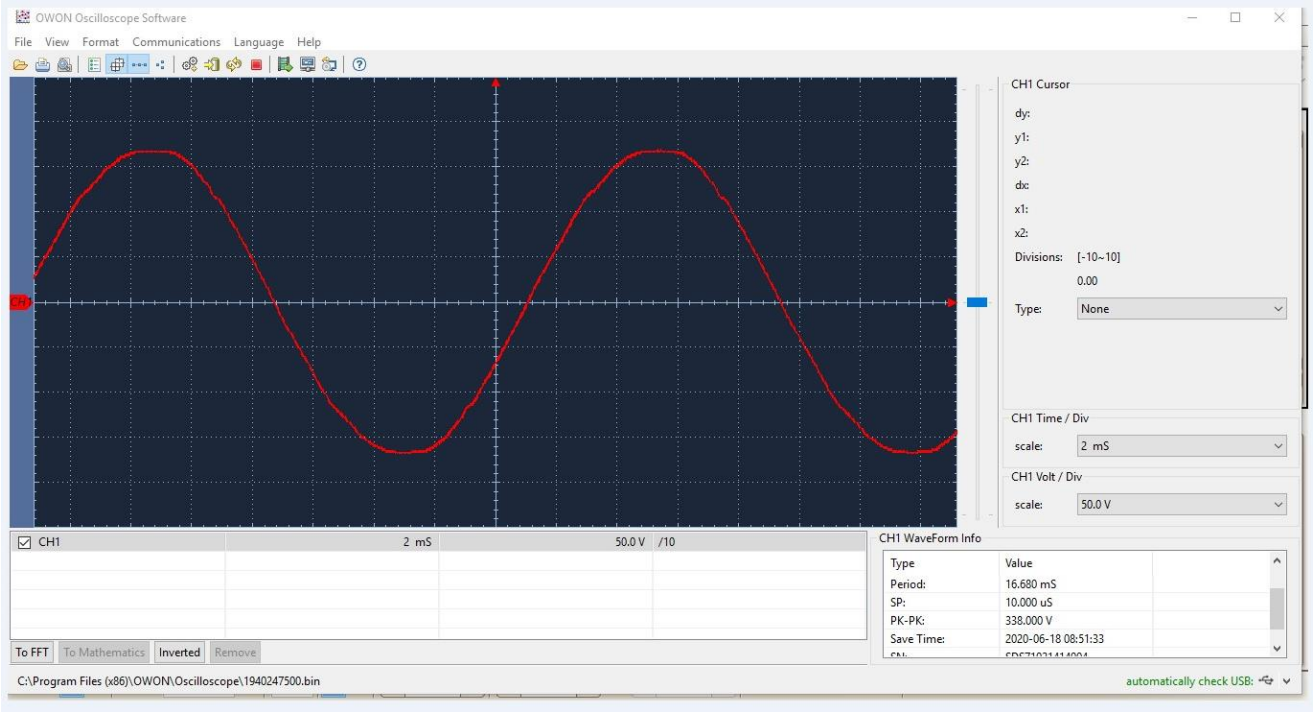
The YELLOW trace is a measurement of what is called the DE that is actually riding the RED waveform. However, you cannot pick out the frequencies present because the amplitude (signal strength) of the 60 Hz signal is so significant that it obliterates the higher frequencies from the measured values. In order to provide this important measurement, you must add a “High Pass Filter” to block the fundamental 60 Hz signal and feed output this to the scope sensor port. I used a “High Pass Filter” to measure the frequencies above 60 Hz. DE is at frequencies from 1 kHz to 10 MHz with biologically active effects starting at about 1.7 KHz.

A word of caution on these small hand-held meters is in regards to their ability to measure the full range of frequencies present. Both the Green Wave and Stetzer cannot measure below 10 KHz or rarely reflect much above 100 KHz. In addition, I have found the EMI meter which looks just like the Green Wave meter rarely agree even though both meters are of almost identical design. I have never gotten two Green Wave meters or two EMI or two SATIC meters to ever agree with one another. The same with the Stetzer Micro Surge meter, I cannot get two of them to agree either.

The only device that’s consistent is an oscilloscope.

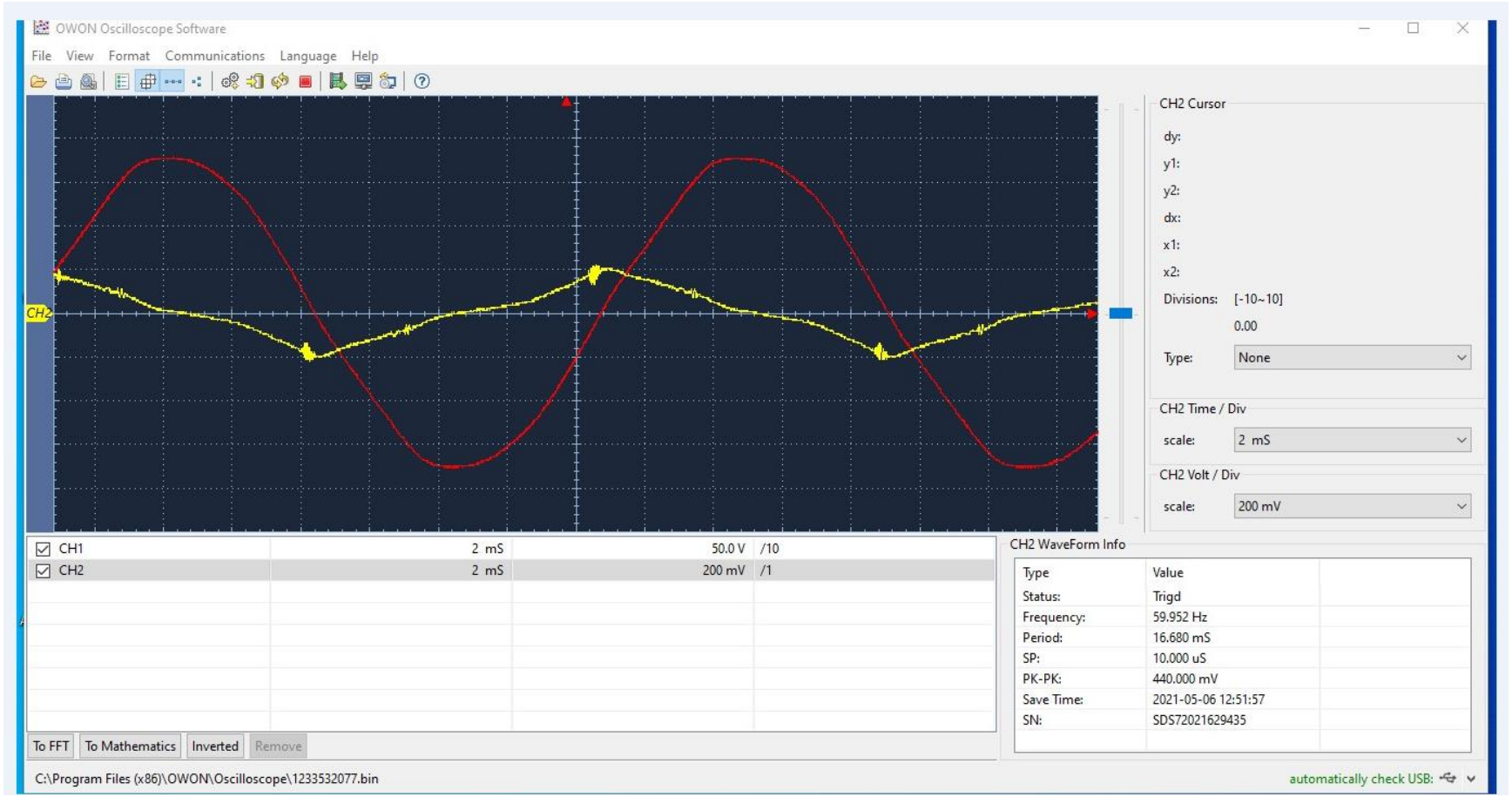
The Standard 60 Cycle wave Form

Here is what I should measure at your home with no filters applied with the OWON scope. This image is just the standard 60 cycle wave form of a typical home. This is very good and shows no significant harmonic distortion from the power company. No filters have been applied in this test.

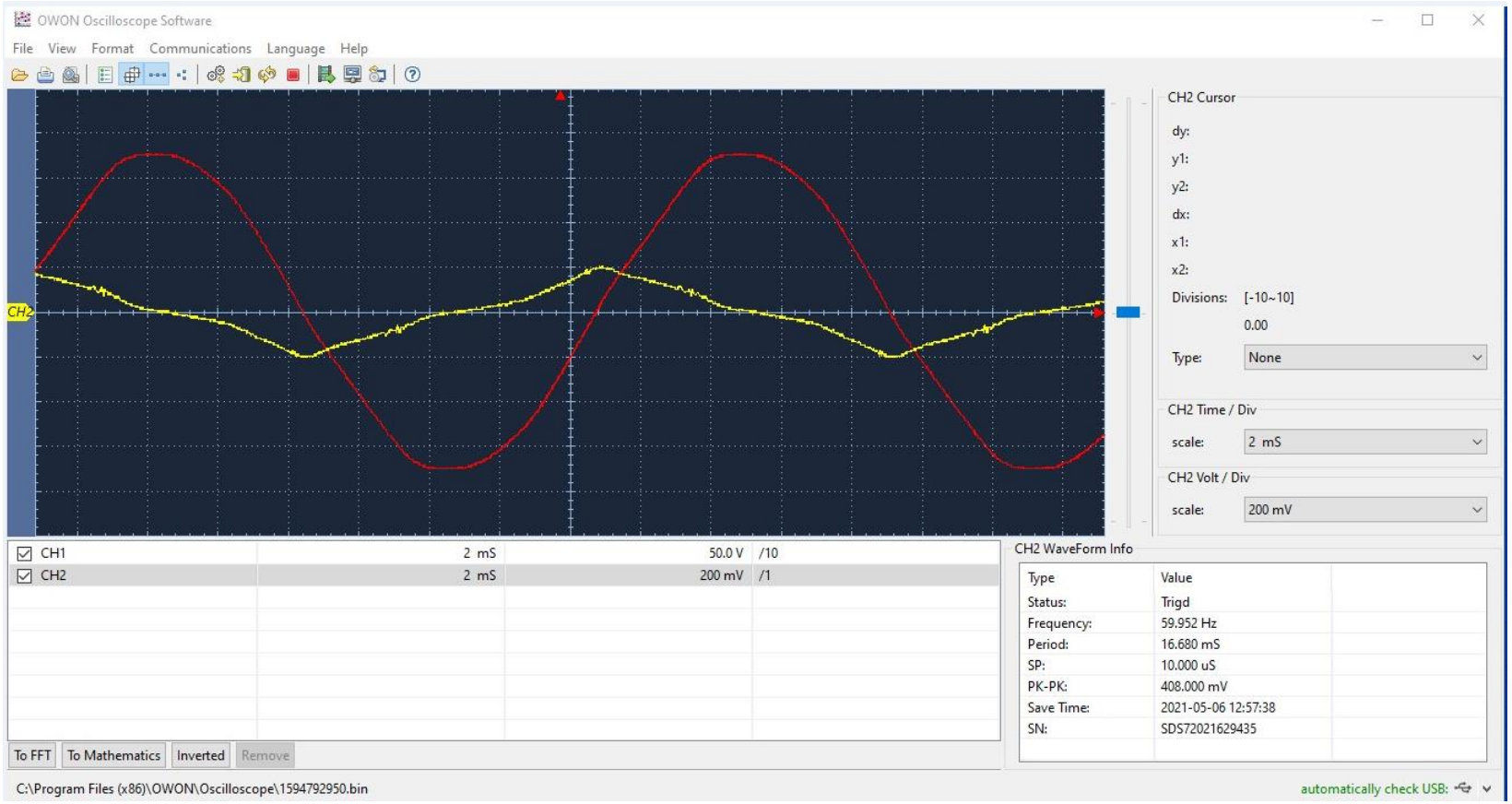


OWON Scope Readings

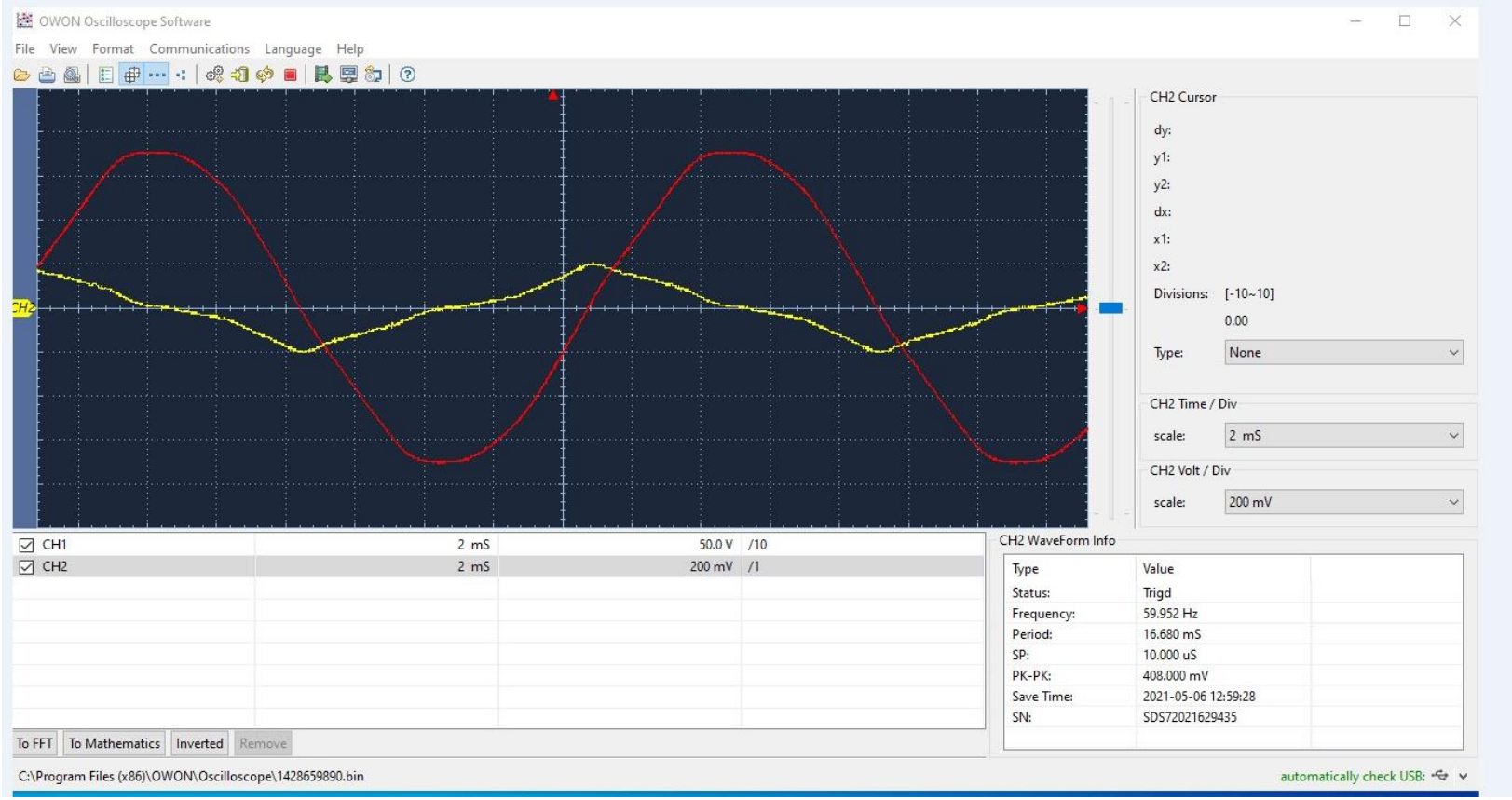
Here is the OWON Scope reading from the power inside your home. You do have some Dirty Electricity at 168 GS units, the recommend limit is 50 GS units.



Here is the OWON Scope reading from the power inside your home. You do have some Dirty Electricity at 168 GS units, but with the Sine Tamer filter applied the GS units were 57.

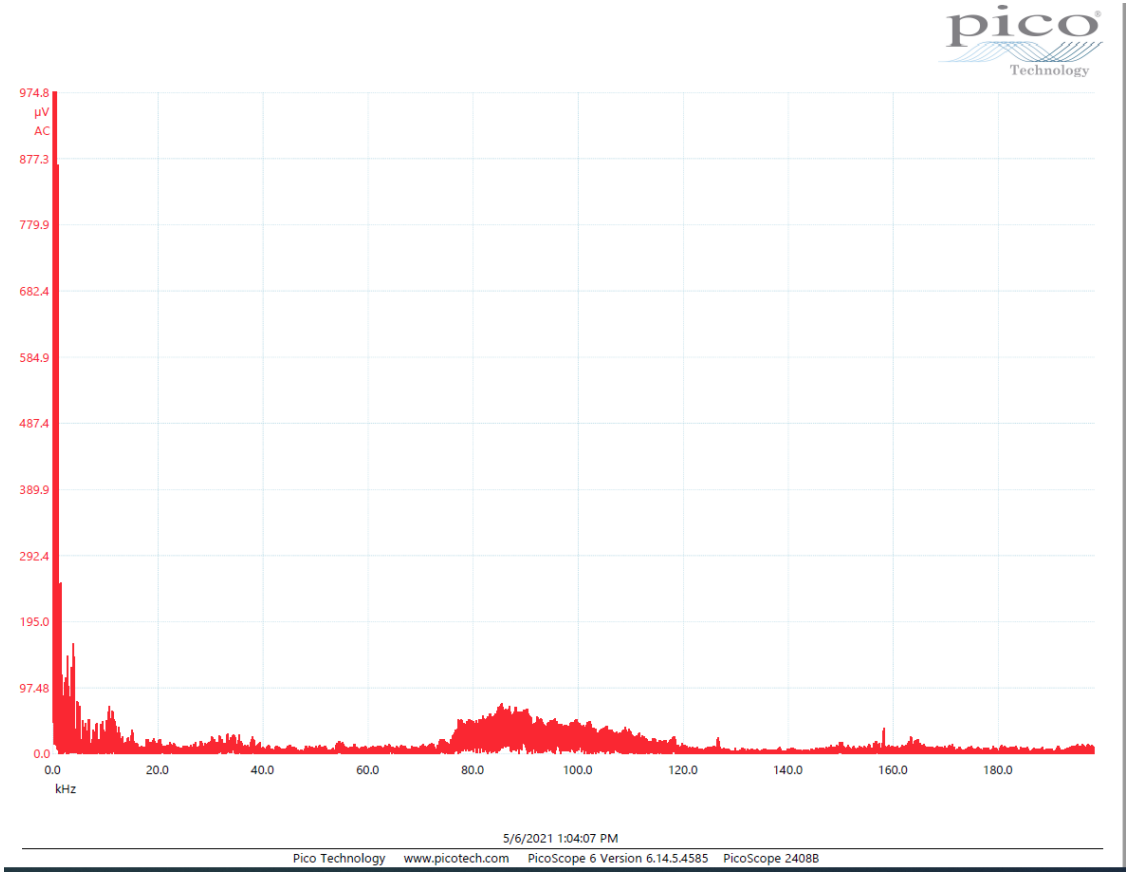


Here is the OWON Scope reading from the power inside your home. You do have some Dirty Electricity at 168 GS units, but with the DNA Brand RxDNA V2X filter applied the GS units were 39.

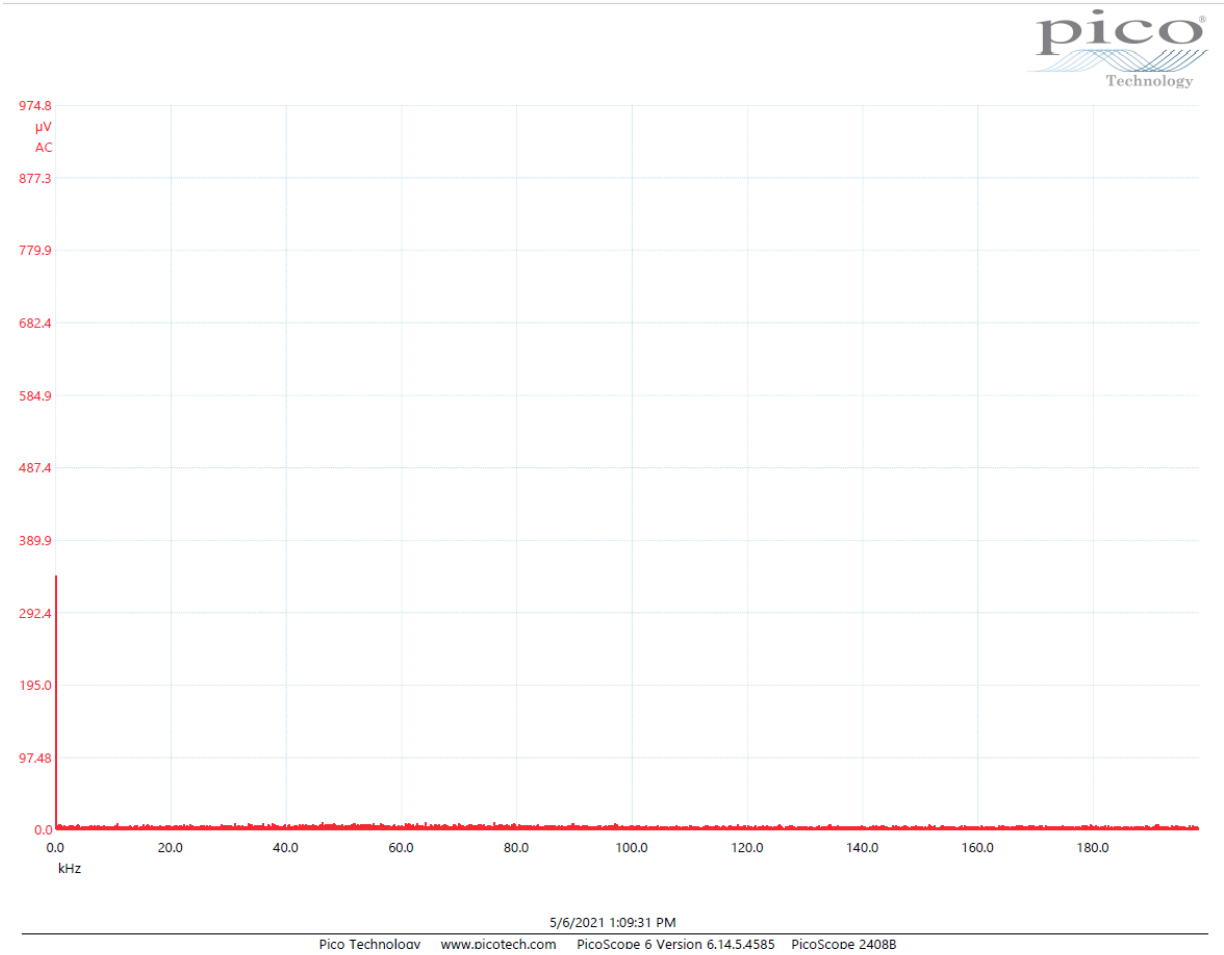


PICO Scope Spectrum View

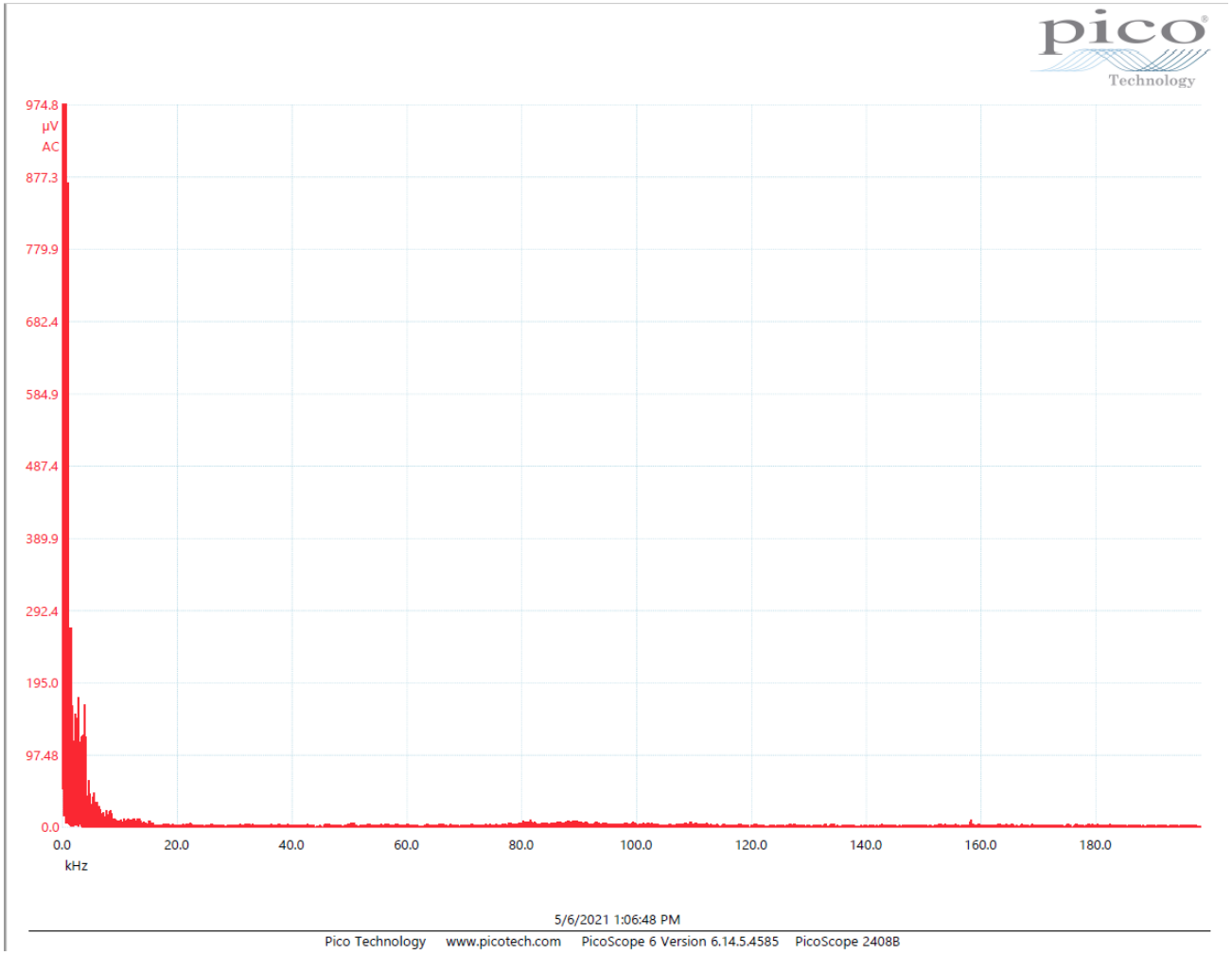
Here is Spectrum View of the Power in your home. This shows the frequency of the signal versus the amplitude of the signal in volts. This example is without any filters applied.



Here is the Spectrum View with a Sine Tamer filter applied. You can see all the signals have been attenuated significantly.



Here is the Spectrum View with a DNA Brand RxDNA V2X filter applied. You can see all the signals have been attenuated significantly but not as well as the Sine Tamer.



DE Remediation Scenarios

You need the Sine Tamer filter. However, there is also a recommendation to improve your system grounding circuit with a 1/0 size insulated copper wire. Add a new shielded ground wire in 1/0 size to a new ground rod. Then extend this wire to the power panels. Stop using unshielded ground wires. Remove the bare ground wire running to the power panel, either by cutting it off or having the electric meter pulled off and properly removed. Then change the ground wire as already mentioned and remove any water pipe ground wire.

Remove any LED bulbs from the whole house.

Improve the ground and neutral circuits to the inductors as already discussed. Remove the wiring errors for Net Current as already discussed.

As I look at the bed maps in the bedrooms, I highly recommend the Safe Sleep Switch be installed, then from key fob remote you can turn off the required breakers to make these charts all green for electric fields.

Light Bulb Test

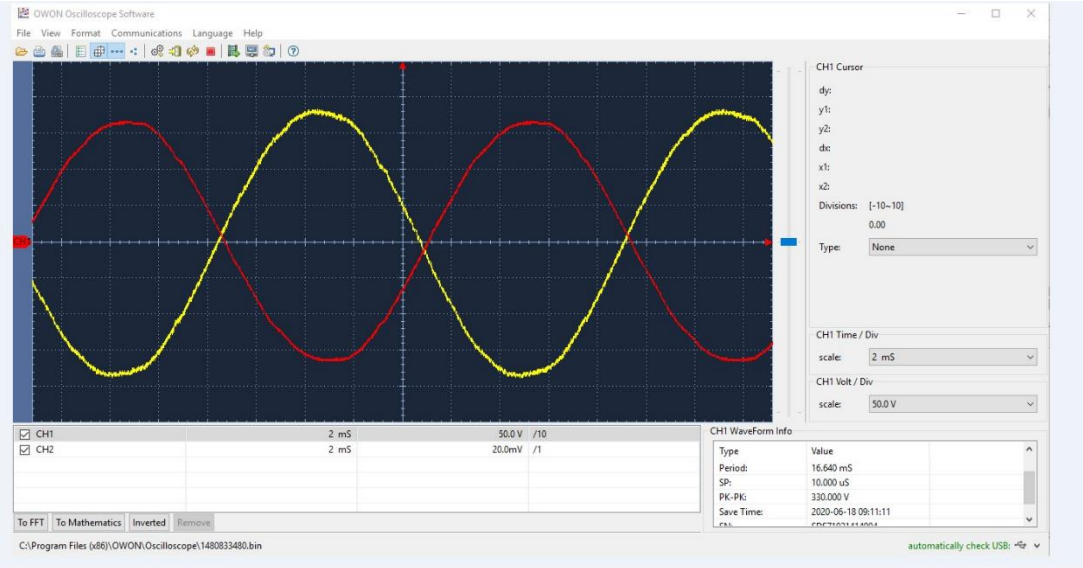
I do not recommend LED bulbs. I realize that perhaps you may think of adding LED lights to save on your power bill, **do not do this**. All your bulbs should be what is called a "Modified Incandescent", some call them Halogen bulbs, (https://www.amazon.com/gp/product/B01AGMZ20O/ref=ppx_yo_dt_b_asin_title_o02_s01?ie=UTF8&psc=1) (https://www.amazon.com/gp/product/B00A282UNK/ref=ppx_yo_dt_b_asin_title_o02_s00?ie=UTF8&psc=1)

these do save energy about 29% on watts, but does not add any voltage above 60 Hz. For example, on the light bulb box it will say 75 Watts but only consumes 53 watts that is the type of bulb you want. Many people are convinced that LED bulbs save energy. However, this would only be true if the meter on the home was an older "Analog" electro mechanical meter that only measured amps (with the old wheel that spun around). But now with a Smart Meter this new meter has an electronic chip that measures both volts and amps, which converts the combined measurement of volts and amps into Volt Amps (VA), which then via software in the meter converts this to KWh. So, while you have an amp's measurement you also have voltage measurement that you did not have before. In your specific example you have 5 volts on each leg of your 240 volts of added voltage on your home so instead of 240 volts you have 250 volts, even though a volt meter will say it is only 240 volts! (120 Volts on each leg). But since all volt meters only measure RMS voltage a volt meter will never pick this up. But

the chip in the Smart Meter will. The other 10 volts (5 volts on each leg) is at frequency higher than 60 Hz, and all volt meters cannot discern this difference. Only an oscilloscope can do this. This sometimes this leads a consumer to complain to the electric company that ever since the Smart Meter was installed their bill went up. In my opinion it is the measurement technique applied that is causing this, not the consumer consumption.

These added voltages above 60 Hz is actually adding to your bill. Your LED bulbs and Dimmer switches are not helping your electric bill because they are adding voltages to be counted. You should be 0.5 volts max. The LED bulbs and Dimmer switches typically increase this voltage causing a large difference. The only person that gains from LED bulbs is the electric company. The Electric company primary cost is generating amps, not voltage. After the initial voltage created by the generator, all voltage is a function of transformers. So, it really does not cost the utility to create volts. But as the amps demand goes up it does cost them more fuel to service the load, which is amps.

Here is an example of a “Modified Incandescent” bulb on the Oscilloscope. The Red trace is primary voltage and the yellow trace is in amps.



You will note the Amps follow the voltage in a uniform pattern. This is normal.

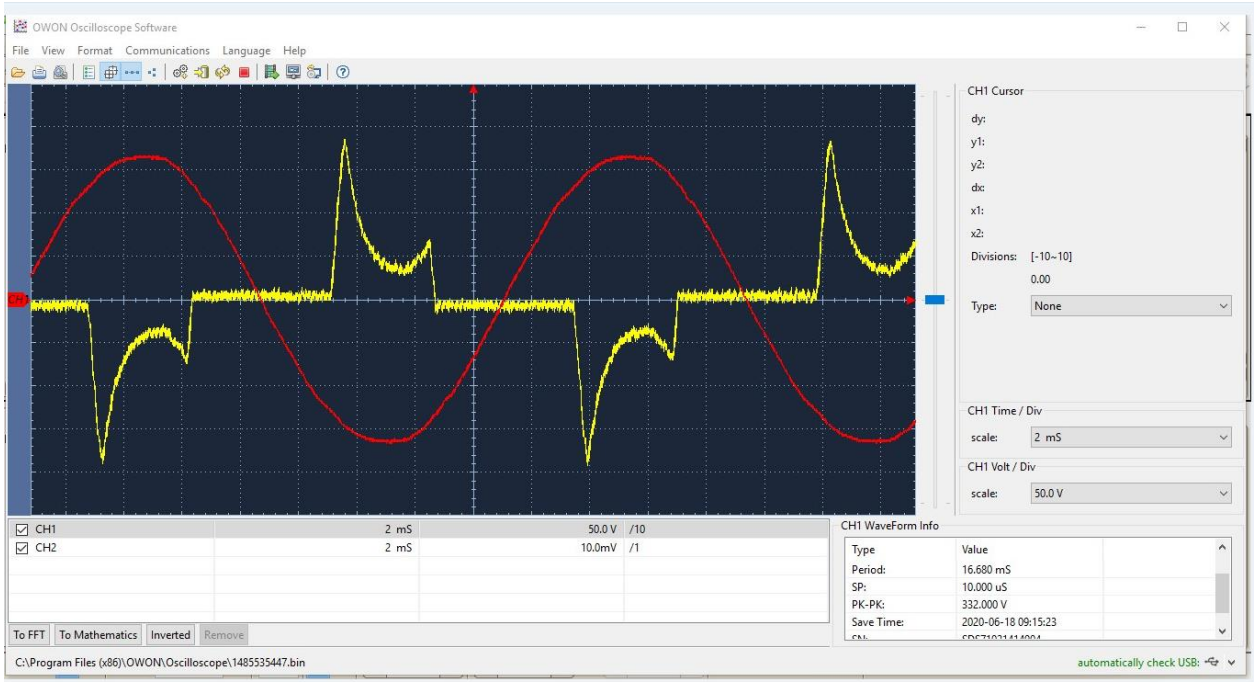
Here is an LED light bulb image. You note the waveform is very irregular. These surges in amperage are highly disruptive to the human body. In addition, this irregular pattern contributes to the flicker of the light. This flicker contributes to the development of Cataracts. Today children as young as 10 years old are being diagnosed with Cataracts, this is unheard of 8 years ago. In addition, the total number of Cataract cases has grown to levels unheard of. I consider the use of LED bulbs is a serious health risk. The LED bulbs light spectrum is skewed more toward the blue to UV light spectrum. There is very little yellow and red spectrum. Again, I want to emphasize there is no yellow or red spectrum. A Modified Incandescent has the full light spectrum from blue to red and everything in between and it is all balanced. It is proven high concentrations of blue to UV light does lead to Cataracts.

https://www.sciencedaily.com/releases/2014/06/140603161934.htm

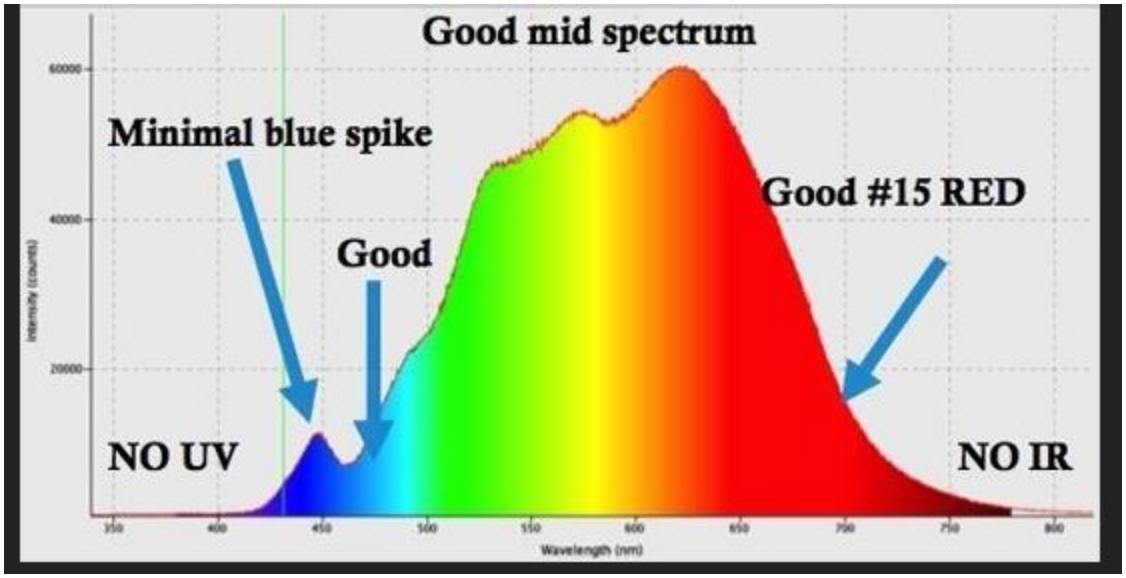
Also review this recent study on blue light from LED's and aging.

https://www.sciencedaily.com/releases/2019/10/191017101253.htm

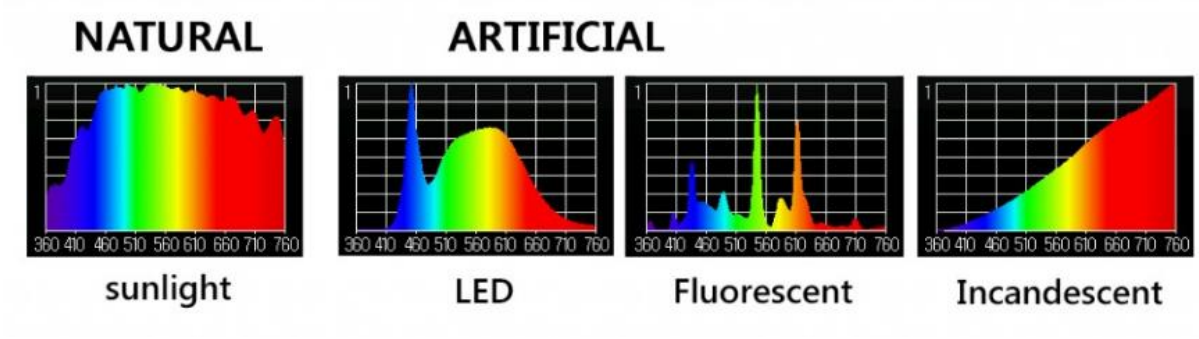
Here is an LED Bulb Scope Image, the Red is voltage and the yellow is current.



Typical Incandescent Bulb Color Spectrum Image



Color optical wavelength Images from LED bulbs and Florescent bulbs



Some Good Test results to compare.

https://youtu.be/WR-PHo3ZWn8

https://www.youtube.com/watch?v=YzovYO81Y3c

https://youtu.be/Tw3LJ94ALJ8

I hope you are coming to realize some of modern convivences and advertising on LED lights we are getting is deceptive.

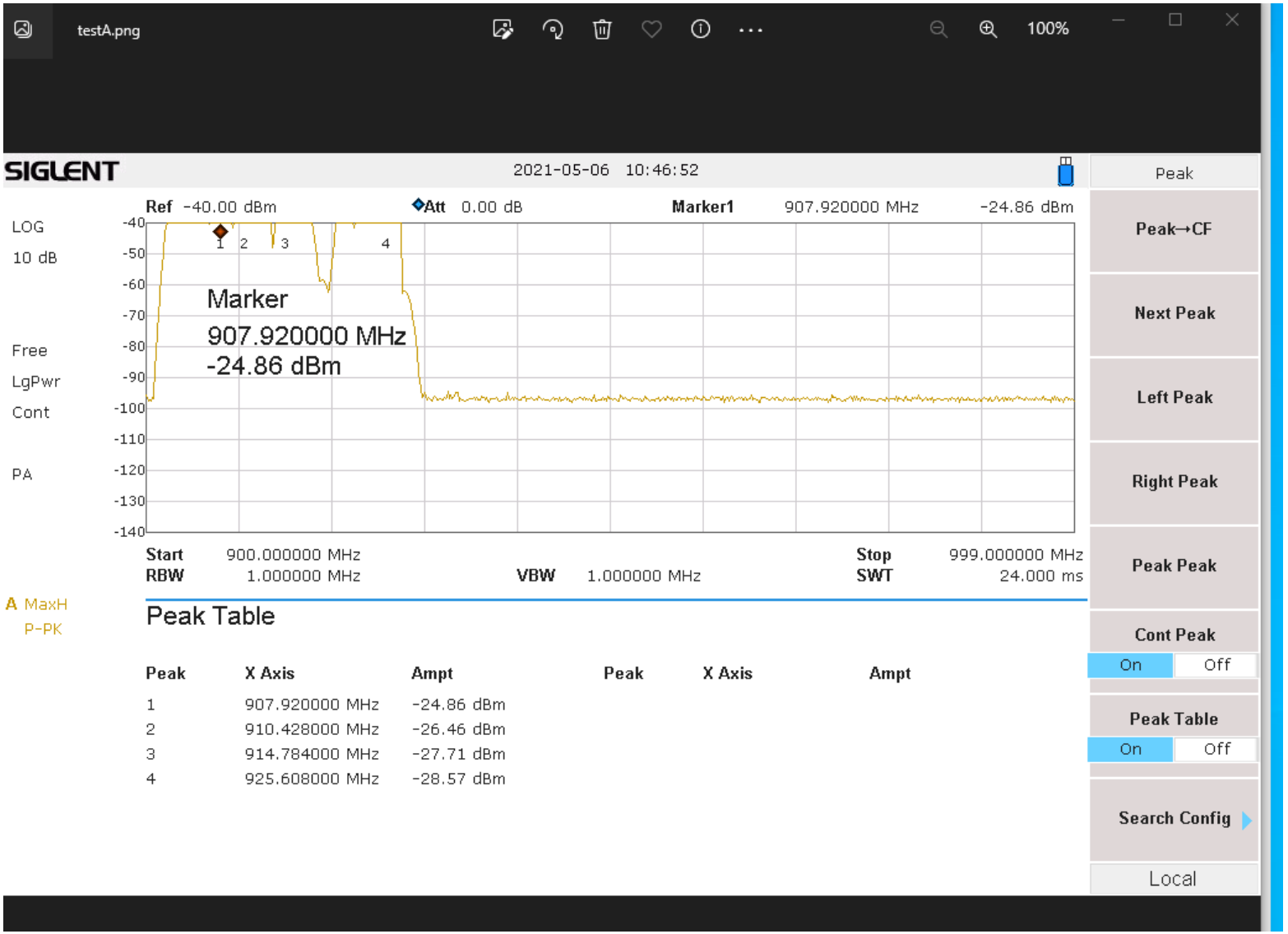
RF Emissions

Here we measured the RF exposures as already documented. The Smart meters are very strong, I would keep yourself and your children as far away from this as possible. opt out of them, if possible, with the utility. If not then I would recommend you obtain my Iron Maiden to block this RF signal. I would get the unit that has the hole on the side, then mount it with the hole pointing down. Then you can safely walk near the meter. I would recommend the Safe and Sound Pro II meter and do your own tests. I would suggest any new appliance be checked before you buy one, especially if they are promoted as “Energy Efficient”.

RF Measurement Results

This is coming from the neighbor's smart meter radiating towards the home, The antenna was over 75 feet away. These are some of the strongest readings I have seen from this distance. The frequencies are all the RF signals from the smart meters and not cell phone. A Smart Meter radiates between 901 and 927 MHz. Please read the following charts, but also watch this video, you will probably need to download it to see it all.

https://drive.google.com/file/d/1JYcIdfqZsX1oNJ0nBrcPcGeOs871wppX/view?usp=sharing

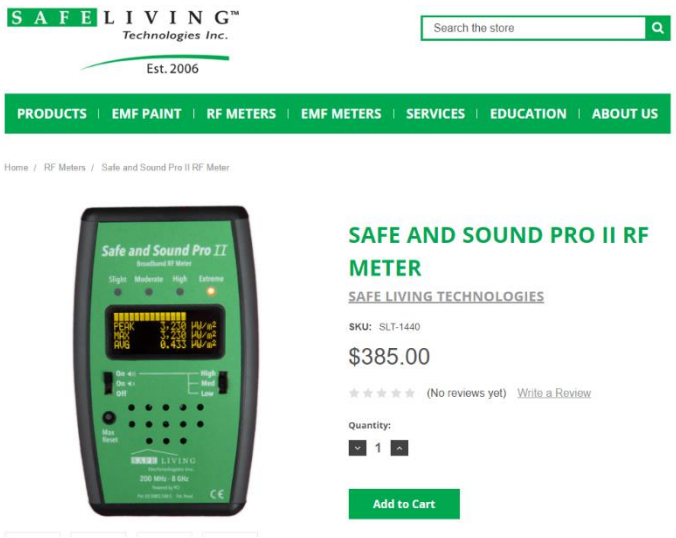

testA.png
100%
SIGLENT
2021-05-06 10:46:52
Peak
Ref -40.00 dBm
Att 0.00 dB
Marker1 907.920000 MHz -24.86 dBm
LOG
10 dB
Free
LgPwr
Cont
PA
Marker
907.920000 MHz
-24.86 dBm
Start 900.000000 MHz
RBW 1.000000 MHz
VBW 1.000000 MHz
Stop 999.000000 MHz
SWT 24.000 ms
A MaxH
P-PK
Peak Table
Peak X Axis Ampt Peak X Axis Ampt
1 907.920000 MHz -24.86 dBm
2 910.428000 MHz -26.46 dBm
3 914.784000 MHz -27.71 dBm
4 925.608000 MHz -28.57 dBm
Peak→CF
Next Peak
Left Peak
Right Peak
Peak Peak
Cont Peak
On Off
Peak Table
On Off
Search Config
Local

Here are more tests done later in the day and the trend is similar there is an over 25 DBm increase in the RF exposure compared to the base line shown of -98 DBm

Here I used a different instrument to measure called the Spectran V4 Meter
Interestingly it showed the RF emissions of the cell phone frequencies were lower than the Smart Meter radiation.

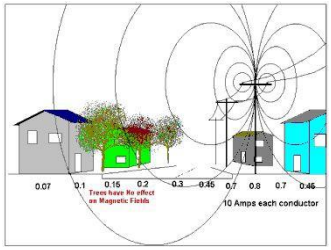
Here is a good meter to use for checking RF emissions

https://safelivingtechnologies.com/products/safe-and-sound-pro-ii-rf-meter.html



Types of EMF Measurements

1. AC magnetic fields

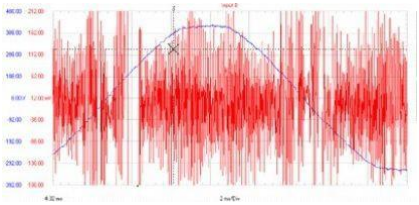


Magnetic fields are created by the flow of electricity through a wire or other metallic path. Generally, the higher the flow of electricity, the higher the levels of magnetic fields present. Levels are typically higher near large power lines, electric panels, and large appliances. They can also be created by stray currents on water pipes and wiring errors.

2. RF Radiofrequency radiation

RF radiation is emitted by wireless technology – cell and radio tower cordless phones, smart meters, Bluetooth, baby monitors, anything which transmits information through the air without wires. Wireless radiation does not drop off as quickly with distance and can travel through walls and buildings.

3. Dirty electricity

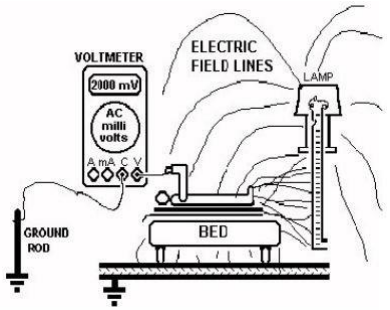


Dirty electricity is electrical pollution in the form of high frequency transients and other radiation found in the wiring. It is generated by fluorescent lighting fixtures, AC power supplies, dimmer switches, computers and other new appliances. Given that standard wiring emits an invisible but always present electric field into the room, these transients, “noise”, or other

unintended frequencies then reverberate throughout our surroundings.

4. Electric Fields

Electric fields are emitted from non-shielded electrical wiring. Whatever frequencies are present in the electric wires will be emitted for a distance of 10-20 feet in all directions. Our bodies absorb these electric fields and become “charged” with not only the 60 Hz cycle alternating current, but any and all dirty electricity that is riding on top of it. We try to reduce the electric fields as much as possible in sleeping and work areas.



Recommended EMF Levels

1

AC Magnetic Fields		No Concern	Slight Concern	Severe Concern	Extreme Concern
Flux Density in milligauss	**mG**	< 0.2	0.2 - 1	1-5	> 5

2

RF Radiofrequency Radiation		No Concern	Slight Concern	Severe Concern	Extreme Concern
Power Density in microwatt per square meter	**$\mu W/m^2$**	< 0.1	0.1 - 10	10-1000	> 1000

3*

Dirty Electricity	No Concern	Slight Concern	Severe Concern	Extreme Concern
Graham / Stetzer GS Units FCC Class B Specs of 250 µV Max	< 30 <250	30 – 50 250-500	51-400 600-800	> 400 >800

4

AC Electric Fields		No Concern	Slight Concern	Severe Concern	Extreme Concern
Field Strength potential-free in volt per meter	**V/m**	< 0.3	0.3-1.5	1.5-10	> 10

*Dirty Electricity Guidelines do not yet exist in official Building Biology standards, as the methods and recommendations are still in development. The Dirty Electricity guidelines on this page are based on

the research of Building Biology practitioners and other researchers.
The only other source of standards for DE is the FCC Class B specification. The maximum rating is 250 µV (Micro Volts) at frequencies above 60 Hz.

EMF #5: DC Magnetic Fields

5

DC Magnetic Fields		**No** Concern	**Slight** Concern	**Severe** Concern	**Extreme** Concern
Flux Density in Nano Tesla	n**T**	< 5000	5K – 10K	10K -100K	2K

Recommended Improvements and Building Biology Principles

Your dwelling is in need of remediation.

- In regard to Indoor Air Quality (IAQ) besides the lack of findings of mold in the lower level which has already been discussed, you have stored several cleaning products and insect sprays under the kitchen sink and in the garage. These materials still outgas harmful chemicals and residue even with the lids closed. It is advised that you remove these from storage inside the home and place them a sealed cooler such as a Yeti Brand Cooler. By storing these products in such a container will keep contained any out-gassing within the home, only open this type of cooler outside and not in the building or garage area. This particular unit has a stainless-steel shell and a very good latch that will not degrade over time.

- In your lower-level area that was not remodeled and there are some things that need to be addressed. The following needs to be addressed.
    - You should increase the size of the ground wire from the current #4 wire to a larger 1/0 size wire. A picture is included here for comparison. A 1/0 wire is 4.66 times larger in outside diameter that the current ground

wire. This would enable mitigation of DE to by creating a low impedance ground path to help remove the frequencies on the power system. DE Frequencies travel on the outside diameter of the wire not thru the center of the wire. Current runs thru the center of a wire and frequencies run on the outside of the wire frequently called the “Skin” of the wire. Therefore, increasing the size of the ground wire will have a very positive effect on removing DE and reducing contact current in the power system.

To help guide you on how to think about your home use the following guidelines from the Building Biology Institute.

The 25 Principles of Bau-Biologie® The following list of twenty-five principles was developed by Anton Schneider, Ph.D., founder of the Institut fűr Baubiologie and Oekologie. These principles can be used while planning the construction of a natural and ecologically friendly home, or while remodeling an existing one.

All of these principles should be read and I recommend you focus on the ones I have highlighted here in **BOLD**:

1. Make sure the building site is geologically undisturbed.
2. Place dwellings away from industrial centers and major traffic roads.
3. Place dwellings well apart from each other in spaciously planned developments amidst green areas.
4. Plan homes and developments individually taking into consideration the human aspect and the needs of family life and nature.
5**.** Use natural and unadulterated building materials.
6. Use wall, floor and ceiling materials, which allow the diffusion of moisture.
7. Allow natural self-regulation of indoor air humidity using hygroscopic materials.
8. Consider sorption of building materials and plants (in- and outside), which allow filtration and neutralization of toxic airborne substances.
9. Design for a balance between heat storage and thermal insulation in living spaces.
10. Plan for optimal surface and air temperature.
11. Use thermal radiation for heating buildings employing solar energy as much as possible.
12. Promote low humidity and rapid desiccation in new buildings.
13. Utilize building materials, which have neutral or pleasant natural scents and which do not emit toxic vapors.
14. Provide for natural light and use illumination and color in accordance with nature.
15. Provide adequate protection from noise and infrasonic vibration or sound conducted through solids.
16. Use building materials that do not have elevated radioactivity levels
17. Preserve the natural (DC) air electrical field and physiologically beneficial ion balance in space.
18. Preserve the natural (DC) magnetic field.
19. **Minimize technical (AC) electric and (AC) magnetic fields and RF Fields.**
20. Minimize the alteration of vital cosmic and terrestrial radiation.
21. Utilize physiological knowledge in furniture and space design.
22. Consider proportion, harmonic orders, and shapes in design.
23. Use building materials that do not contribute to environmental problems and high energy cost in the production process.
24. Do not support products or building materials that over-use limited and irreplaceable raw materials.
25. Support building activities and production of materials which do not have adverse side effects of any kind and which promote health and social well-being.

Be cautious that any contractors you use are not using materials you have not approved of in advance and in consideration of the conservation of materials and are not wasteful of natural resources.

In referral to **Building Biology Principle 19**, you have an issue with AC electric fields on in the power systems and sleeping and working areas. These are in excess of building biology standards and should be addressed. You already have ROMEX power wiring you should consider changing to MC cable metal clad cabling in the walls and ceiling of the house and it is likely that the unshielded lamps and lamp cords are contributing to these electric fields. This can be addressed by using shielded wire, **I HIGHLY RECOMMEND THIIS** and it is easy to do.

POWER CORD, SHIELDED

"Shielded for Both Electric and Magnetic Fields"

Replace the power cord on your lamps, hair dryer, small appliances, power tools and more with these MuCord™ power cords to reduce electric and magnetic fields from the cord to nearly zero. Standard 3-prong (North American Style) plug is included. Patented wiring configuration inside the cable causes cancellation of the fields. Use whenever the power cord travels near a person's body. Very unique!

NEMA 5-15 plug (3-prong, grounded)
Up to 14 Amp, 120V

(Requires knowledge of how to properly wire the free end to your electric device. Instructions included.)
Plug style and color may vary from image.

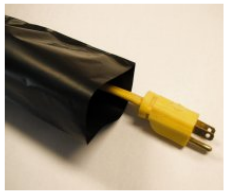
Power Cord, Shielded:

- 6 foot long (Cat. #A736-6) ..... $26.45 Add to Cart
- 12 foot long (Cat. #A736-12) ..... $36.95 Add to Cart

In addition, you can add the following to the wires leading to the lamps as shown above.

CONDUCTIVE TUBING

Reduces Electric Fields From Live Wires To Ground Zero!



Composed of electrically conductive black polyethylene and great for shielding electrical cords. It's easy to slide any electrical cord (even fits those giant dryer plugs!) through this 4" wide (when flat) sleeve without having to remove the plug from the end of the cord. Surface resistivity <1000 ohms/square. Only 4 mil thick, it won't hold up to tearing, heat or abuse, but it's tough enough to do a great job on the lamp cord by your bed, the air conditioner cord, or even cables in your car. Use a grounding cable, and please be careful when handling electrical cords. Specify desired length.

Conductive Tubing (Cat. #A1211) ..... $1.15 /lin ft Add to Cart

Roll Price [750 feet] (Cat. #A1211-roll) ..... $229.00 Add to Cart

The implementation of the shielded wire cords for the lamps and the conductive tubing are inexpensive to do and you can likely do this yourself or take it to a lamp store and have them retrofit the existing lamps.

In referral to Building Biology Principle 23, when you do the changes to the lower level consider the use of source that is domestically based in a radius of not more than 200 miles from your home. Avoid the use of plasticizers in the installation of these materials and oil derived materials in the sealing of air gaps and use inert natural materials such as clay, plaster, and some natural fibers, including cotton, sheep's wool, straw, and hemp as materials.

Occupant User Manual

As a guide in the future consider the following as a kind of "Occupant User Manual" to help you when shopping or planning for future home improvements and living in the home.

- Use natural, locally sourced materials. Avoid the use of materials high in hydrocarbon content derived from a refined oil product. Look at Material Safety Data Sheets (MSDS) of the products you are considering for hazardous chemicals and non-biodegrade content.
- Be very cautious on storing chemical-based products for cleaning and laundry. Use nature as a guide for cleaning product selection or make your own from natural materials.
- Assure house ventilation is maintained and fresh air is allowed to access the environment.
- You currently have fresh air combustion input to both furnaces for heating, but you should consider leaving the master bedroom windows are open a small amount to promote reduction of CO^2 in the sleeping area and improve oxygen levels.
- Keep house plants out of inside the home. You do not have any house plants inside the home. Consider cut flowers use, this is very good, you may not realize that plants with soil pots can be a means for all type of insects to enter the home, including mite, flies, ants, spiders and Gnats. Once these insects enter a home, they are extremely difficult to remove, they will even infest furniture and rugs.

Conclusions

This survey did indicate some concerns. There is a severe concern for RF levels and a concern for AC Electric fields DE. In the bedrooms, get rid of electric fields with a Safe Sleep Switch. You should install this at filter at the main panel. You should apply shielding and Smart Meter such as the Iron Maiden shielding as has been discussed or better yet Opt-Out.
Any LED bulbs must be replaced. You can conduct a Conduct a “Blue Box” test to determine wiring errors, details are on my web site. The use of cell phones within the home is not recommended. Your phones should be replaced with a simple phone such as a Princess Phone or other standard phones as an example. Please review my section later on, in this report on using a cell phone via an ethernet cable. Also check my “EMF Safe Sleep” references for Electric Fields and magnetic fields in the bedrooms. You will never get better until all the RF and strong AC electric fields are mitigated or removed.

In addition, I would highly recommend you change the service disconnect grounding connections with a 1/0 sized ground wire.

Read this article on doing this service disconnect.

Meter Disconnect Installation Notes u

WIFI solutions:

I realize there are household members that will have a difficult time with removing WIFI entirely, you can consider using this type of router because it only turns on WIFI when an authorized device requests it and the power level and number of transmissions per second can be adjusted. I recall seeing that you have one of these already.
I have one of these at my house and it works well. While I do not use WIFI my wife does use WIFI from her cell

phone and are not full time. When she leaves the house or turns off her phone the WIFI stops. automatically. In addition, I have turned down the power levels such that when it is on it does not seem to bother me because the power level is very low and the number of transmissions is very low compared to any other typical router on the market. Most routers on the market blast full strength and at full duty cycle all the time.

$300

JRS Eco-WiFi 100 D2

WIFI doesn't transmit when not being used

On/Off Button for WIFI

90% reduced pulse frequency

Radiation levels can be reduced by as much as 99%

Timer for scheduled powering down.

Action Plan Summery

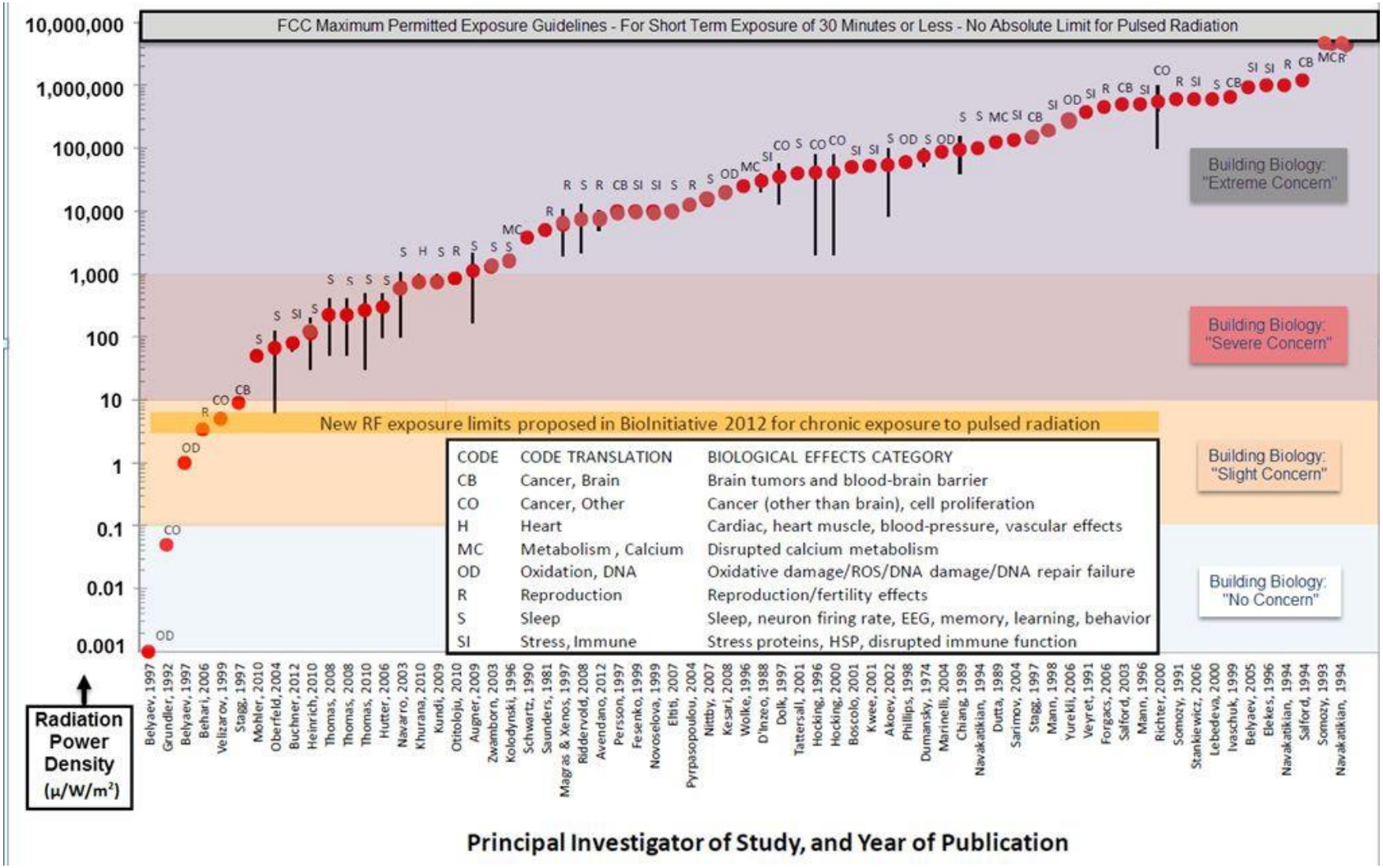
In order of most important to least, please use this action plan to address the issues found during my inspection.

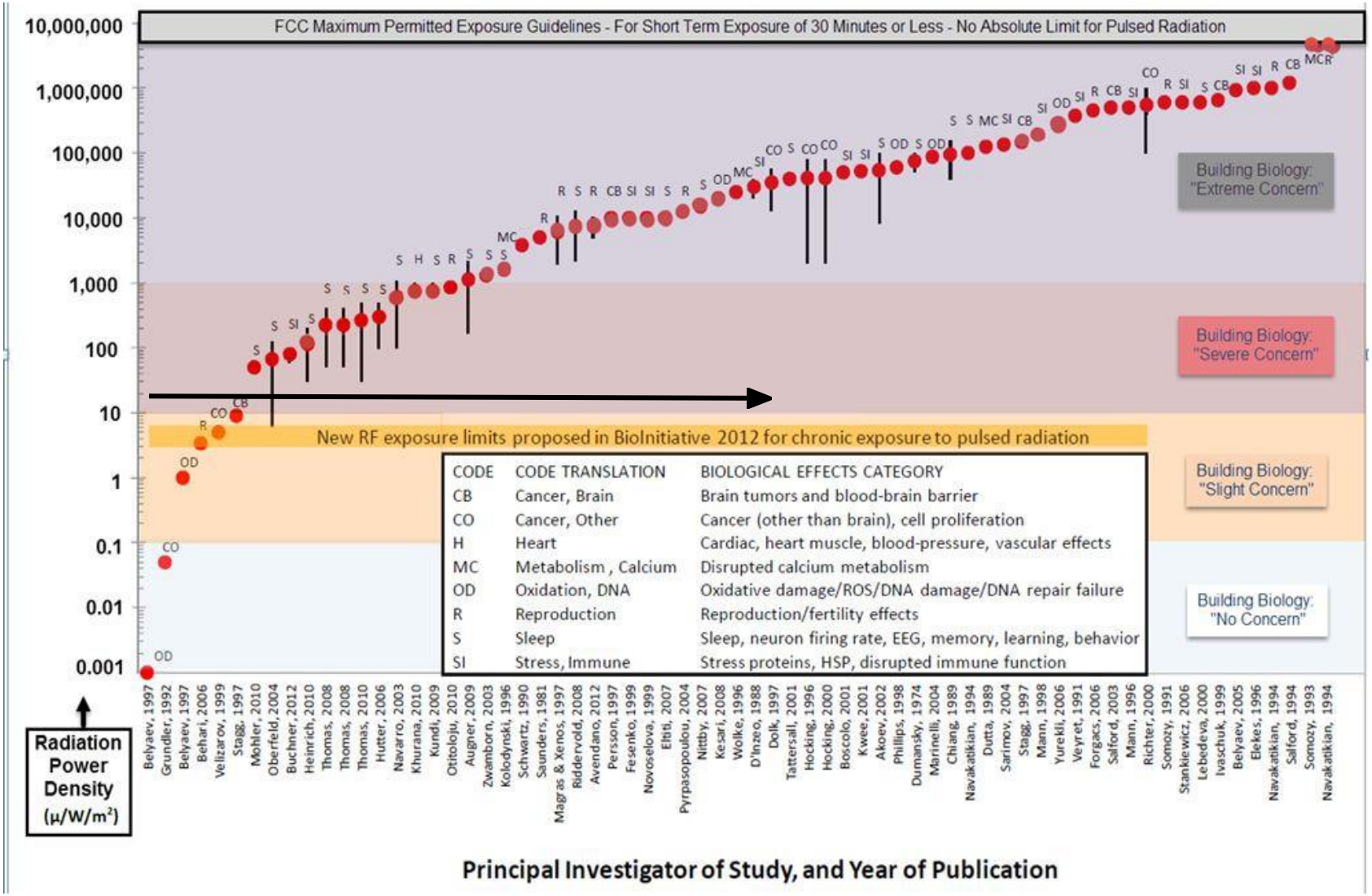
1. Install a 1/0 size grounding wire and rod from the mail panel to the ground outside.
2. Get Safe Sleep Switch
3. Install the RxDNA V2X filters at the power panel.
4. Consider installing iron maiden or other shielding over smart electric and gas meters. Or better yet opt out.
5. Eliminate the WIFI entirely, install MOCA adapter as described in this report. Go all cabled internet.
6. Upgrade furnace filter from MERV 9 to MERV 11+.
7. Verify/calibrate oven temperature using thermometer.

Other Valuable Information that you should review

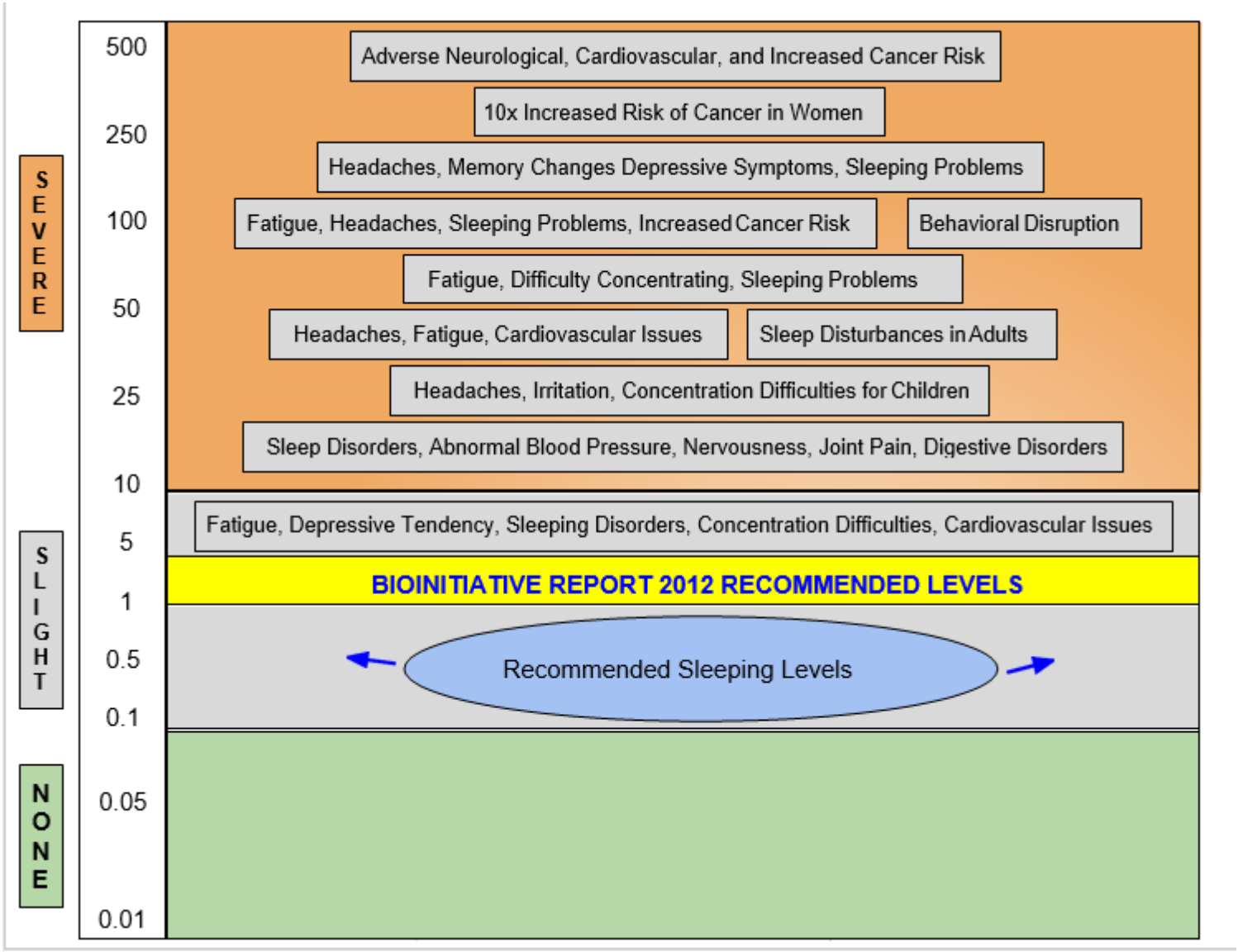
RF Radiofrequency radiation is emitted by wireless technology – cell and radio towers, smart meters, Bluetooth, baby monitors, anything which transmits information through

The Bio-Initiative Report on RF Levels (µW/M²)




FCC Maximum Permitted Exposure Guidelines - For Short Term Exposure of 30 Minutes or Less - No Absolute Limit for Pulsed Radiation
10,000,000
1,000,000
100,000
10,000
1,000
100
10
1
0.1
0.01
0.001
Building Biology: "Extreme Concern"
Building Biology: "Severe Concern"
Building Biology: "Slight Concern"
Building Biology: "No Concern"
New RF exposure limits proposed in BioInitiative 2012 for chronic exposure to pulsed radiation
CODE | CODE TRANSLATION | BIOLOGICAL EFFECTS CATEGORY
CB | Cancer, Brain | Brain tumors and blood-brain barrier
CO | Cancer, Other | Cancer (other than brain), cell proliferation
H | Heart | Cardiac, heart muscle, blood-pressure, vascular effects
MC | Metabolism , Calcium | Disrupted calcium metabolism
OD | Oxidation, DNA | Oxidative damage/ROS/DNA damage/DNA repair failure
R | Reproduction | Reproduction/fertility effects
S | Sleep | Sleep, neuron firing rate, EEG, memory, learning, behavior
SI | Stress, Immune | Stress proteins, HSP, disrupted immune function
Radiation Power Density (μ/W/m²)
Belyaev, 1997
Grundler, 1992
Belyaev, 1997
Behari, 2006
Velizarov, 1999
Stagg, 1997
Mohler, 2010
Oberfeld, 2004
Buchner, 2012
Heinrich, 2010
Thomas, 2008
Thomas, 2008
Thomas, 2010
Hutter, 2006
Navarro, 2003
Khurana, 2010
Kundi, 2009
Otitoloju, 2010
Augner, 2009
Zwamborn, 2003
Kolodynski, 1996
Schwartz, 1990
Saunders, 1981
Magras & Xenos, 1997
Riddervold, 2008
Avendano, 2012
Persson, 1997
Fesenko, 1999
Novoselova, 1999
Eltiti, 2007
Pyrpasopoulou, 2004
Nittby, 2007
Kesari, 2008
Wolke, 1996
D'Inzeo, 1988
Dolk, 1997
Tattersall, 2001
Hocking, 1996
Hocking, 2000
Boscolo, 2001
Kwee, 2001
Akoev, 2002
Phillips, 1998
Dumansky, 1974
Marinelli, 2004
Chiang, 1989
Navakatikian, 1994
Dutta, 1989
Sarimov, 2004
Stagg, 1997
Mann, 1998
YureMi, 2006
Veyret, 1991
Forgacs, 2006
Salford, 2003
Mann, 1996
Richter, 2000
Somozy, 1991
Stankiewicz, 2006
Lebedeva, 2000
Ivaschuk, 1999
Belyaev, 2005
Elekes, 1996
Navakatikian, 1994
Salford, 1994
Somozy, 1993
Navakatikian, 1994
Principal Investigator of Study, and Year of Publication

RF Levels in µW/M²



Magnetic Fields and Health Effects

Biological Effects of
AC Magnetic Fields.

Biological Effects of AC Magnetic Fields

Biological Effects of AC Magnetic Fields Measured in Milligauss (mG)
By Stephanie Sage Kerst, EMRS

9040 mG	Institute of Electrical and Electronics Engineers (IEEE) Recommended Limit for Public Exposure (there are no US federal standards for limiting ELF-EMF AC magnetic field exposure).
2000 mG	International Commission on Non-Ionizing Radiation Protection (ICNIRP) Recommended Limit for Public Exposure.
16 mG	**Intermittent** exposure to AC magnetic fields results in an 80% increased risk of miscarriage for pregnant women (Li et al 2002).
> 5 mG	Building Biology Severe Concern Level
≥ 4 mG	A 560% increased risk of all major cancers in Danish children living near high voltage power lines (Olsen et al 1993).
3-4 mG	In 2001, ELF-EMF (AC magnetic fields) classified as a Class 2B possible carcinogen by the International Agency for Cancer Research (IARC) of the World Health Organization based on an increased occurrence of childhood leukemia (Kheifets, 2005).
≥ 3 mG	Children in remission from leukemia had a 450% increased risk of dying when recovering in homes with 3 mG or greater (Foliart 2006).
> 3 mG	An 87% increased risk of hematological cancer in adults living near high voltage power lines (Youngson 1991).
> 2 mG	Magnetic field exposure during pregnancy results in a 3.5 fold increased rate of asthma in child (Li et al 2011).
≥ 2 mG	A 710% increased risk of childhood leukemia in children under four years of age sleeping in 2 mG or above (Michaelis 1997).
1.9 mG	A 70% increased risk of acute myeloid leukemia and chronic myeloid leukemia for adults living near high voltage power lines (Feychting 1994).
≥ 1.4 mG	A 570% increased risk of leukemia in children under six years of age than for children with exposure under 0.3 mG (Green 1999).
≥ 1.3 mG	A 200% increased risk of ADHD diagnosis in children living in homes ≥ 1.3 mG; a 338% increase when ADHD persists into adolescence (Li et al 2020).
1-5 mG	Building Biology Severe Concern Level
1 mG	BioInitiative 2007 Precautionary Target Level
0.2-1 mG	Building Biology Slight Concern Level
< 0.2 mG	Building Biology No Concern Level

Sage Living www.sageliving.us

References:

IEEE SCC 28 (now ICES). IEEE C95.6-2002.

ICNIRP statement—guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz)" Health Physics vol 99 pp 818-836 2010.

US Environmental Protection Agency (EPA) on Lack of Federal Standard: https://www.epa.gov/radiation/radiation-resources-outside-epa#powerlines.

Li DK, Odouli R, Wi S, et al. A population-based prospective cohort study of personal exposure to magnetic fields during pregnancy and the risk of miscarriage. Epidemiology. 2002;13(1):9-20. doi:10.1097/00001648-200201000-00004.

Building Biology Institute Guidelines SBM2008. https://buildingbiologyinstitute.org/wp-content/uploads/2019/03/SBM-2008C-v3.6.pdf

Olsen JH, Nielsen A, Schulgen G. Residence near high voltage facilities and risk of cancer in children. BMJ. 1993;307(6909):891-895. doi:10.1136/bmj.307.6909.891.

Kheifets L Shimkhada R. 2005. Childhood Leukemia and EMF: Review of the Epidemiological Evidence. Bioelectromagnetics Supplement #7, 1-7.

Foliart DE, Pollock BH, Mezei G, et al. Magnetic field exposure and long-term survival among children with leukaemia [published correction appears in Br J Cancer. 2006 Mar 27;94(6):940]. Br J Cancer. 2006;94(1):161-164. doi:10.1038/sj.bjc.6602916.

JHAM Youngson et al. A case/control study of adult haematological malignancies in relation to overhead powerlines. Br J Cancer 63:977-985. 1991.

Li, D. K., Chen, H. & Odouli, R. Maternal Exposure to Magnetic Fields During Pregnancy in Relation to the Risk of Asthma in Ofspring. Arch.Pediatr.Adolesc.Med. (2011).

Michaelis J, Schüz J, Meinert R, et al. Combined risk estimates for two German population-based case-control studies on residential magnetic fields and childhood acute leukemia. Epidemiology (Cambridge, Mass.). 1998 Jan;9(1):92-94. DOI: 10.1097/00001648-199801000-00014.

Feychting M, Ahlbom A. Magnetic fields, leukemia and central nervous system tumors in Swedish adults residing near high voltage power lines. Epidemiology 1994. 5:501-509.

Green LM, Miller AB, Agnew DA, et al. Childhood leukemia and personal monitoring of residential exposures to electric and magnetic fields in Ontario, Canada. Cancer Causes Control. 1999;10(3):233-243. doi:10.1023/a:1008919408855.

Li D, Chen H, Ferber JR, Hirst AK, Odouli R. Association Between Maternal Exposure to Magnetic Field Nonionizing Radiation During Pregnancy and Risk of Attention-Deficit/Hyperactivity Disorder in Offspring in a Longitudinal Birth Cohort. JAMA Netw Open. 2020;3(3):e201417. doi:10.1001/jamanetworkopen.2020.1417

BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF) at www.bioinitiative.org, August 31, 2007.

BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Radiation at www.bioinitiative.org, December 31, 2012.

For further reading: Briefing Report on Electromagnetic Fields: Health Effects, Public Policy and Site Planning by CL Sage, MA and SA Sage, BS. J. Aust. Coll. Nutr. & Env. Med. Vol. 25 No.2 (August 2006) pages 3-6 & 9.

One Possible RF solution is a Bed Canopy

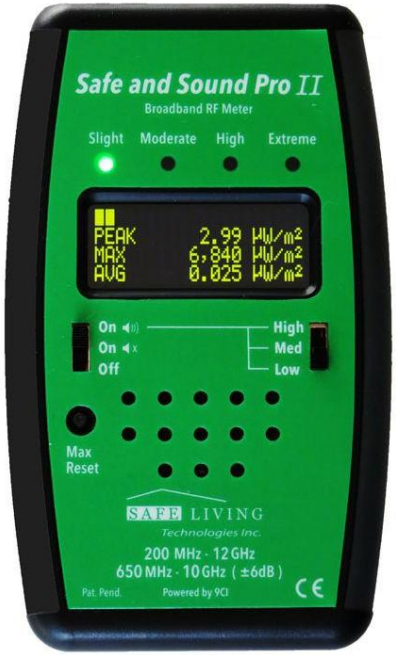
A bed canopy blocks over 99% of RF radiation.
This can make for a large improvement in the quality of sleep.

A high-quality bed canopy made of Naturelle material, which is a soft ecological fabric from Europe, and is comfortable for even the most sensitive, you can buy this at Safe Living Technologies.

RF Meters (Wireless Radiation)

Best Overall

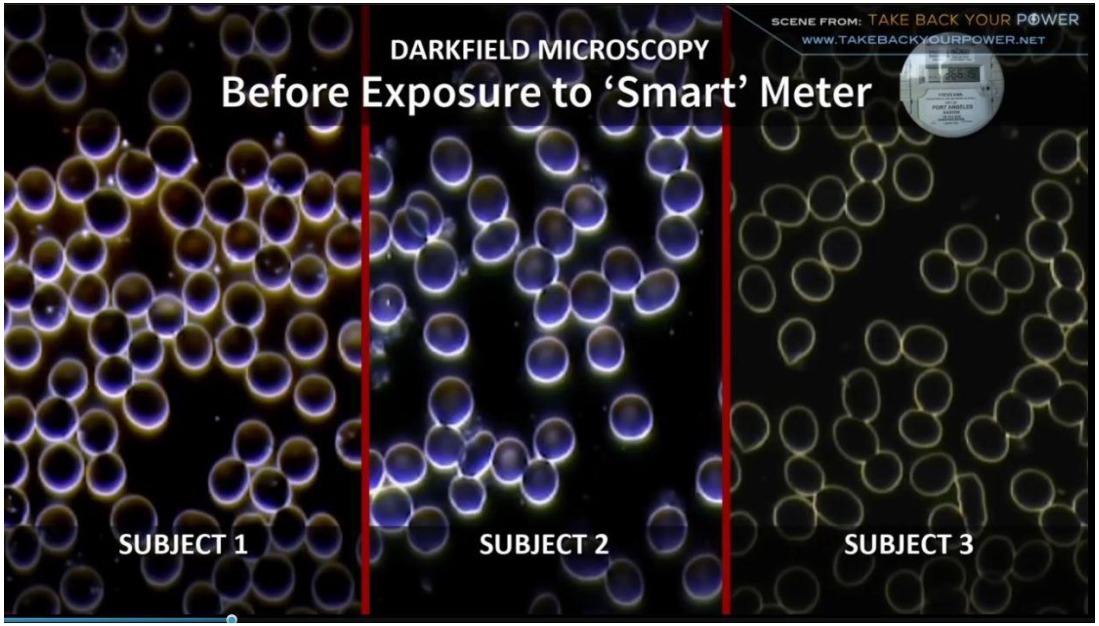
Safe and Sound Pro II

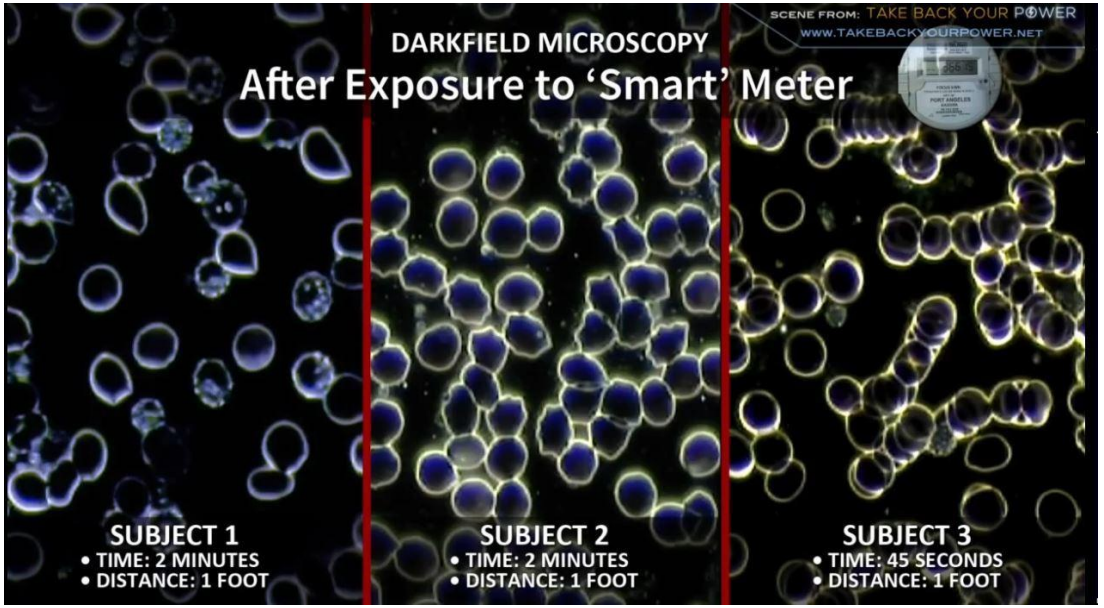


These photos show before and after images of blood exposed to wireless radiation.

Although the source of radiation were smart meters, it would be expected that the same reactions would occur to other sources, such as cell phones or Wi-Fi devices.

See video (Link)

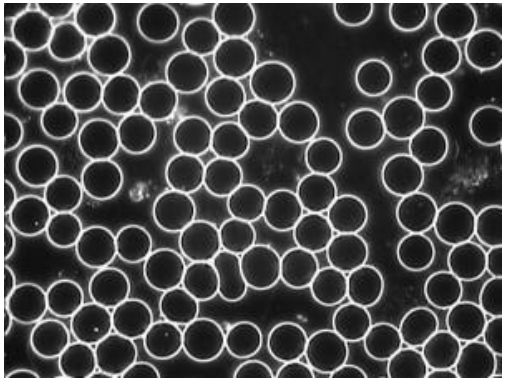



DARKFIELD MICROSCOPY
After Exposure to 'Smart' Meter
SCENE FROM: TAKE BACK YOUR POWER
WWW.TAKEBACKYOURPOWER.NET
SUBJECT 1
• TIME: 2 MINUTES
• DISTANCE: 1 FOOT
SUBJECT 2
• TIME: 2 MINUTES
• DISTANCE: 1 FOOT
SUBJECT 3
• TIME: 45 SECONDS
• DISTANCE: 1 FOOT

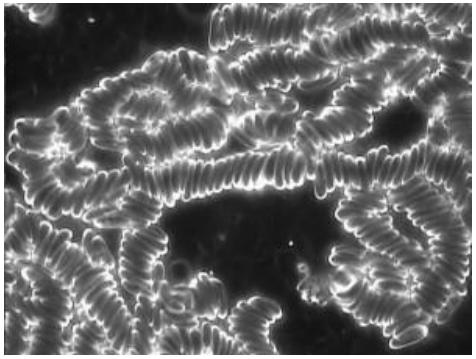
Short-Term Exposure to Cell Phone Radiation Effects on Blood

Weston A Price Foundation Study

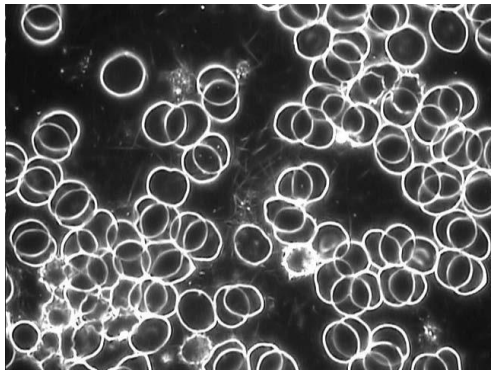
Effects of carrying a smart phone in a backpack



Before exposure



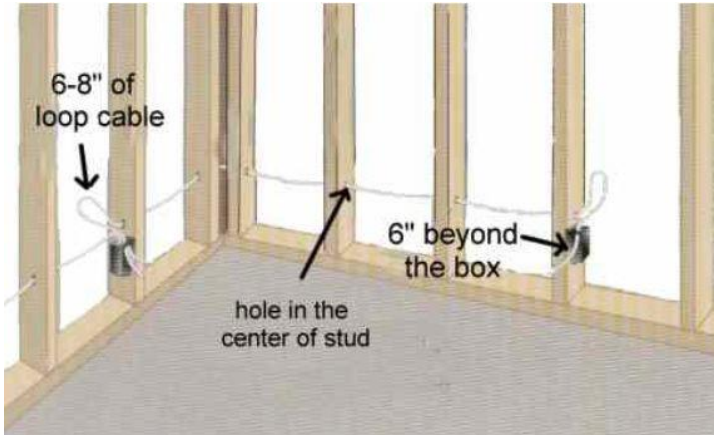
After carrying smart phone in backpack – (not in airplane mode).



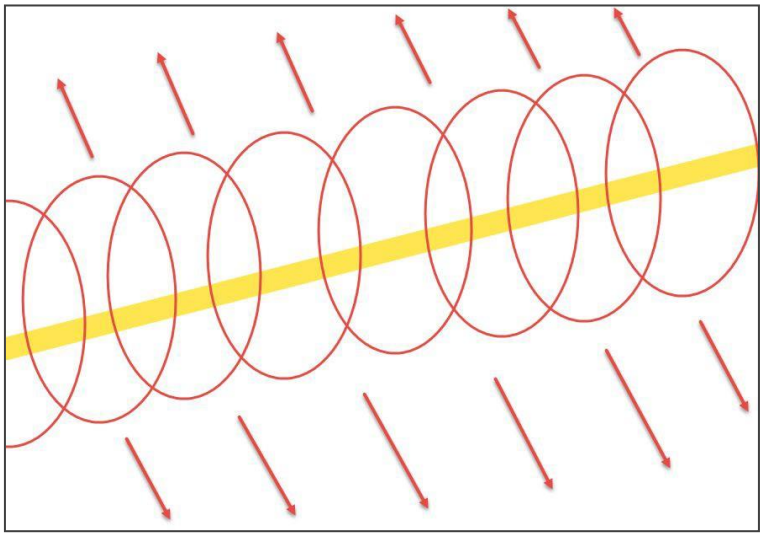
45 mins after turning off cell phone

AC electric fields are emitted by standard non-shielded electric wires that are electrified (carrying electricity).

Standard Romex wiring



Wires are throughout the walls, ceilings, and floors of our homes.

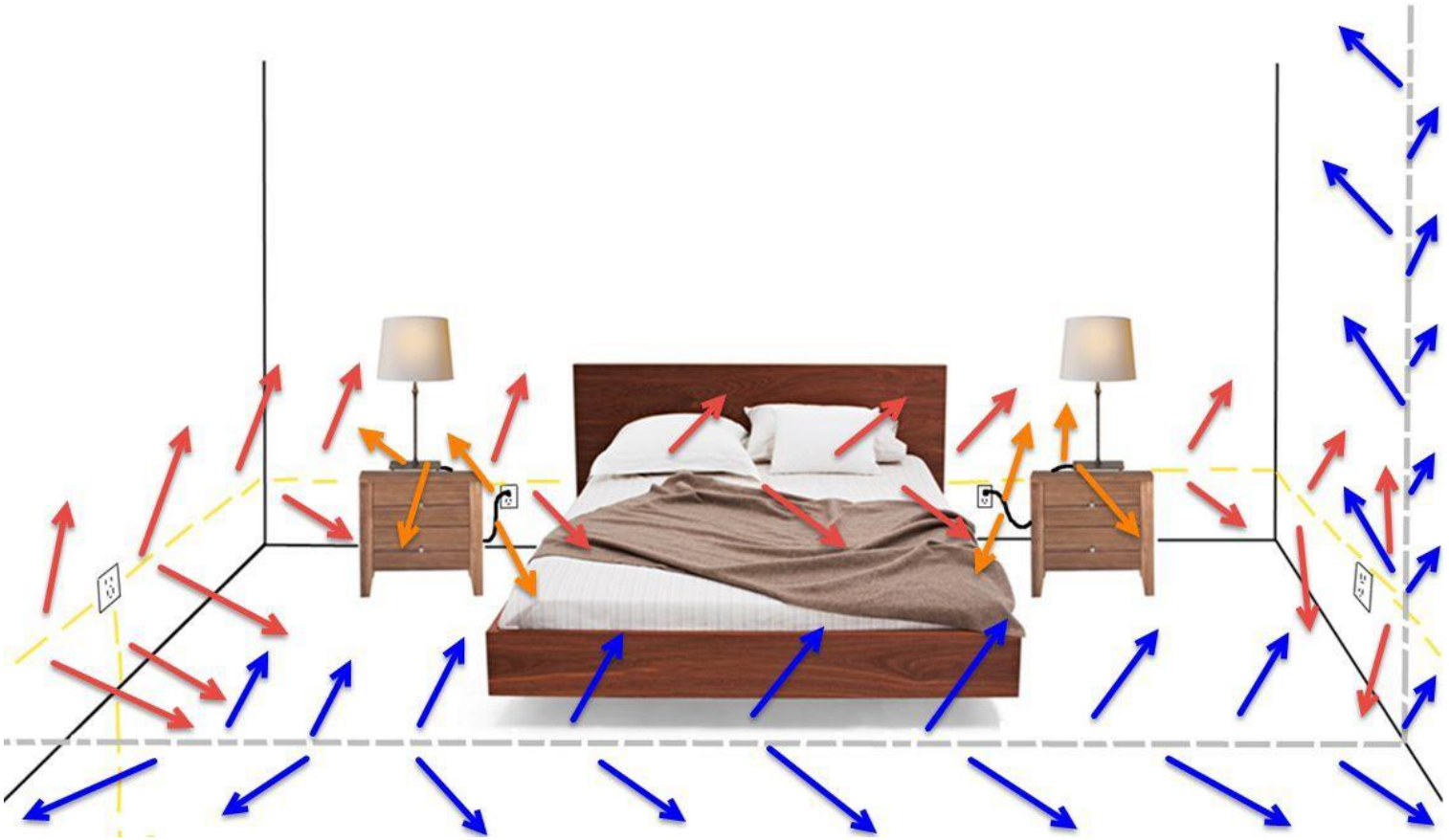


When electricity is running through unshielded wires, they give off an electric field for about 15 feet in all directions.

A bedroom

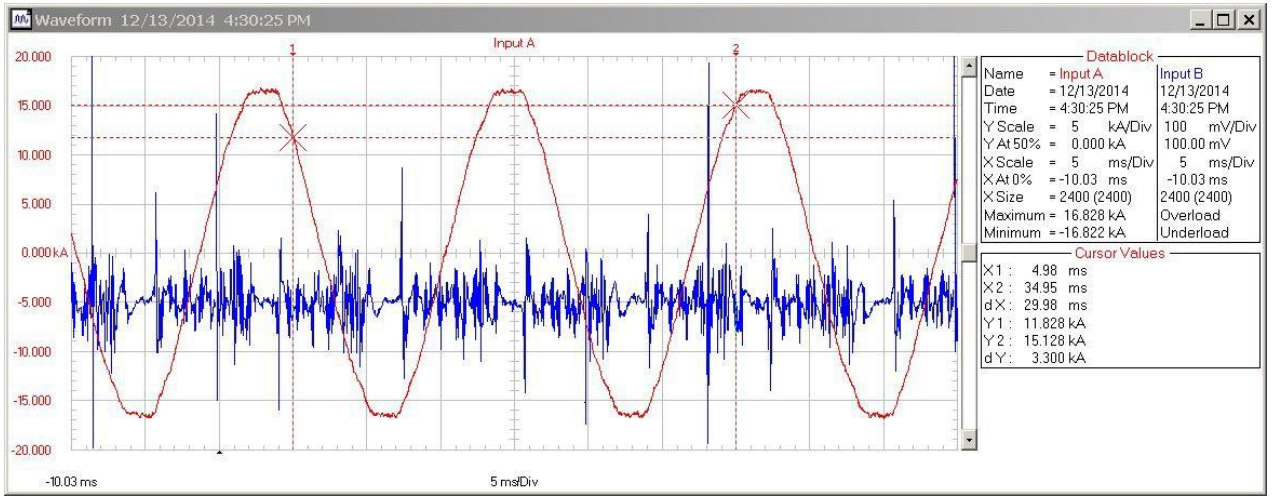
A bedroom if you could see the hidden wires.

The wires constantly emit electric fields, throughout the bedroom even while we sleep.



Any frequencies that are present in the wiring, such as

dirty electricity, will be emitted within these electric fields.



Some consider this type of EMF to be the most harmful.

If we shut off the breakers to these circuits, no electricity flows from the panel through them, and the electric field EMF's stop being emitted.

This allows our bodies to rest free of these electromagnetic fields, which can have many benefits such as deeper sleep.

Hardwiring Cable Internet
Comcast, COX, Spectrum

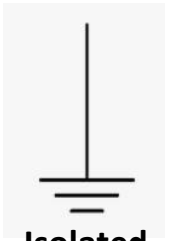
Modem (Arris 6183)

Coaxial Cable

6 Foot CAT 7 Ethernet Cable

TrendNet Router

Ethernet Grounding Adapter



Isolated Outside Ground

25 Foot CAT 7 Ethernet Cable

Note: If adding other computers or other devices, simply plug another CAT 7 cable into the router and connect it to your device.

Without an Ethernet Port?

Laptops and Devices with USB Ports

USB

[Grounded Ethernet Adapter – Electra Health EMF]

[Shielded Ethernet CAT6 or CAT 7 Cable]

Some MacBook’s Require a Different Adapter

Newer MacBook’s have a USB-C port.

You will need an adapter to plug in a wired mouse or a wired keyboard.

.

$45

Signal Tamer

Reduces levels by 60%+

$110

JRS Eco-wifi 01A on Asus

. On/Off button for WIFI

90% reduced pulse frequency

Radiation levels can be reduced by as much as 99%

Timer for scheduled powering down.

$300

JRS Eco-WiFi 100 D2

WIFI doesn't transmit when not being used

On/Off Button for WIFI

90% reduced pulse frequency

Radiation levels can be reduced by as much as 99%

Timer for scheduled powering down.

Low EMF Computer Resources

1. Use laptop with wired internet
2. Make sure to disable the Wi-Fi on the laptop
3. Don't use the laptop on your lap.
4. Use a wired external keyboard and mouse.
5. Move the laptop further away.
6. Run the laptop on battery power when you can
7. Ground the laptop with a grounding plug from ElectraHealth EMF
8. Used Shielded ethernet cable and grounding adapter.
9. You can even connect the laptop to an external monitor.
   Preferably the monitor would be several years old.

See article for additional information.

ElectraHealth EMF Grounding plug

Home > Networking

Ultimate Grounding USB to Gigabit Ethernet Adapter with USB 3.0 Hub

Part Number usb-gige-hub

★★★★★ 2 Review(s)

Ultimate Grounding USB to Gigabit Ethernet Adapter with USB 3.0 Hub

Write a Review Questions about this item? Ask here. (See 2 Questions)

PRICE

Retail Price: $79.97
Your Savings: $34.97
Your Price: $45.00

Availability: In Stock - Ready to Ship

CHOOSE OPTIONS

Choose a Color: (•) White ( ) Black

Quantity 1 Add to Cart

Add to Gift Registry Add to Wish List

Reducing Cell Phone Radiation Exposure

Air Tube Headset

Wave Cage

Place this on the car seat or in the house when cell phone needs to be on

Corded Telephones:

Reach out and touch someone without radiating yourself.

Best black telephone without answering machine: AT&T 2940

Best white telephone without answering machine: AT&T 2909

Best white telephone with answering machine: AT&T 4940

Best 2-line telephone with backlight display AT&T 17929

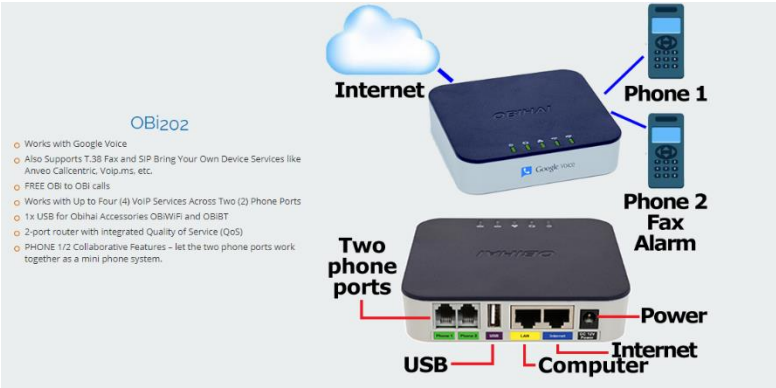
There are also a variety of other styles of phones, including retro – Princess Phones.

Long white cord Long black cord

The best thing is to have an electrician install a wall plate.

This way the phone can be securely mounted on the wall and
you can stretch the cord without the phone falling off a counter or desk.

How to use your Cell Phone to make calls on an Ethernet Cable Connection

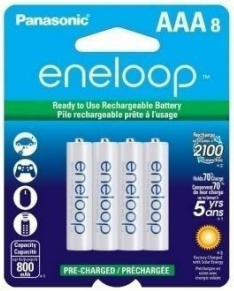


1. First, I will say I find this works very well! I use this every day.
2. Get a Google Voce account phone number (you need a Gmail Account)
3. Use an Android cell phone – Apple will not work, do not even bother trying
4. Get an Obi202 Device
5. Hook up the OBi202 to your router via a cable, use a regular corded phone for initial configuration. There are You Tube tutorials on how to set this up. You now have a free two-line home phone service!
6. Install Google Voice app on your phone
7. Obtain a Pluggable or equivalent cell phone to Ethernet adaptor (model USBC-TE1000 or equivalent) https://www.amazon.com/gp/product/B087QZVQJX/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1
8. Configure Google Voice to ring your cell phone when you are not home to answer your home phone. So, if you are mobile and using the cellular service you can get all the calls that ring at your home phone on your cell phone.
9. To place calls, use the Google voice app on the Cell Phone.
10. Voice mails can be heard on the Google Voice account or in your Gmail email.

Resources for Turning Out the Lights

[Headlamp]

[Battery-Powered Alarm Clocks]



[AAA Rechargeable Batteries]

[Battery Charger]

Light Bulbs

[Halogen Filled Incandescent Light Bulbs]

[BR30 Halogen]

Recommended EMF Meters

Motorola

MB-8600

Modem

($150)

AC Magnetic Fields
$310

Dirty Electricity
$130

AC Electric Fields
$140

EMF is the
Elephant in the room

What are EMFs?

Human beings are exposed to both native (natural) and non-native (man-made) energy sources known as EMFs--electromagnetic fields or forces. The natural ones include such things as the earth's Schumann resonance, sunlight and cosmic radiation. **All man-made EMFs are dramatically increasing: wherever possible it is best to limit or reduce exposure.** The entire spectrum of energy is referred to as the electromagnetic spectrum as shown in the diagram above.

Reducing EMF exposure basically comes down to a simple strategy: **measure** with the appropriate meter to **understand** the environment, **mitigate** - remove or reduce exposure time with distance and shielding, so you can **mend.** Categories of EMF with some basic recommendations are outlined below:

ELF/VLF: Extremely low frequency and Very low frequency EMFs are basically the “corded” EMF category and include electrical wiring, all electronics, appliances, computers, etc. Measuring these fields utilizes a body voltage meter and achieving acceptable levels given here. *The EMFSafe Switch effectively addresses limiting this category.*

MF: Magnetic fields are a type of EMF typically generated in conjunction with the ELF/VLF fields whenever electricity is flowing through a wire or path. *If you use The EMFSafe Switch, this will most likely be addressed.* However, it is a good idea to test your home with a gauss meter as there can be sources distant from your bedroom that would need remediation. This would typically be external power sources requiring shielding or faulty home wiring.

RF: Radio frequency fields include cell phone, radio and microwave energies. Sources include anything wireless from cell phones, to blue tooth, to smart meters and appliances, to cordless phones, to baby monitors, to WiFi . . . Avoiding/limiting usage indoors as much as possible is primary. Blocking sources from outside your home is more involved: options include shielding paints, fabrics and in extreme circumstances the construction of a faraday cage. *The EMFSafe Switch should be used in conjunction with these shielding solutions where ever external originating EMF is an issue.* The meter used to assess RF fields is an RF meter.

The EMF Sleep Switch

(Use Discount Code DE Filters for a 5-10 % off https://emfsleepsafe.com/)

https://youtu.be/miRDr2KY6p0

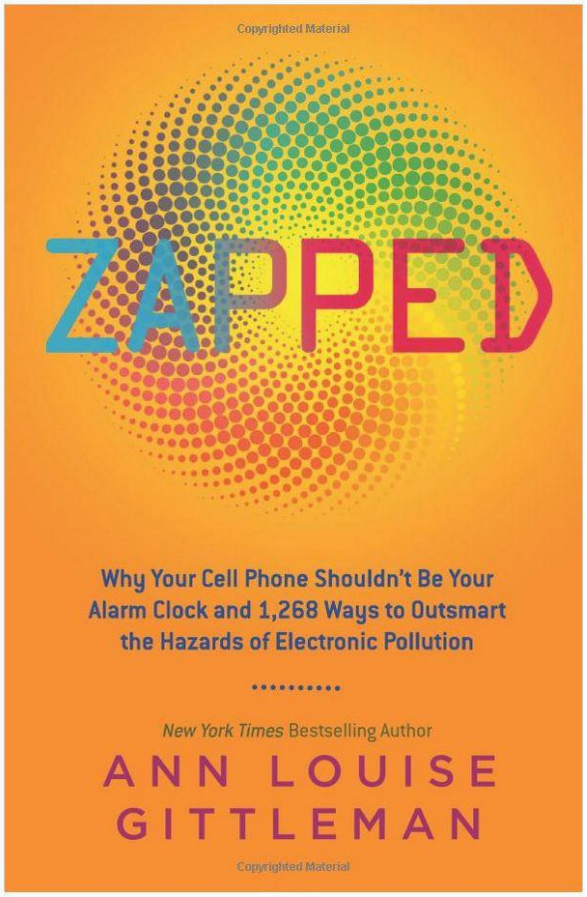
The NP-06, other models are available (Includes turning Off Power and Neutral wires- Recommended)

Body Voltage Measurement kit

BVKc (with "E" Pen)

- EMFSafe "E" Pen
- Color OLED screen "BV" meter
- Handle with adjustable cord
- Circuit tester
- 2x grounding cord
- Hard shell case
- FREE shipping

Nutritional Aspects for EMF's and Health



The book "Zapped" has a number of really helpful suggestions on what kinds of foods and other supplements are useful for increasing our resiliency to EMF's.

The author, Anne Louise Gittleman, is a health guru with years of experience in health and nutrition. Her insights are valuable.

She recommends, among other things, eating foods that are high in glutathione, which is a "free-radical scavenger, protects DNA, keeps you energized, reduces inflammation and pain, and neutralizes heavy metals and toxins."

This is found in asparagus, artichokes, broccoli, walnuts, blueberries, and a variety of other foods.

This is a great book – very informative.

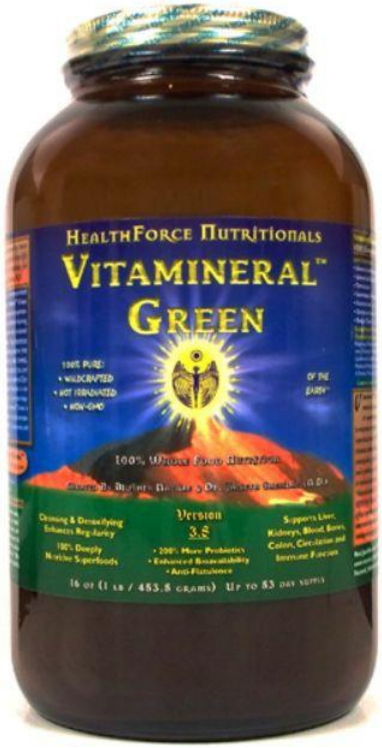
You can also rent a video online of her 2014 interview.

http://emfsummit.com/

Preview: Link

Nutritional Aspects for EMF's and Health (cont'd)

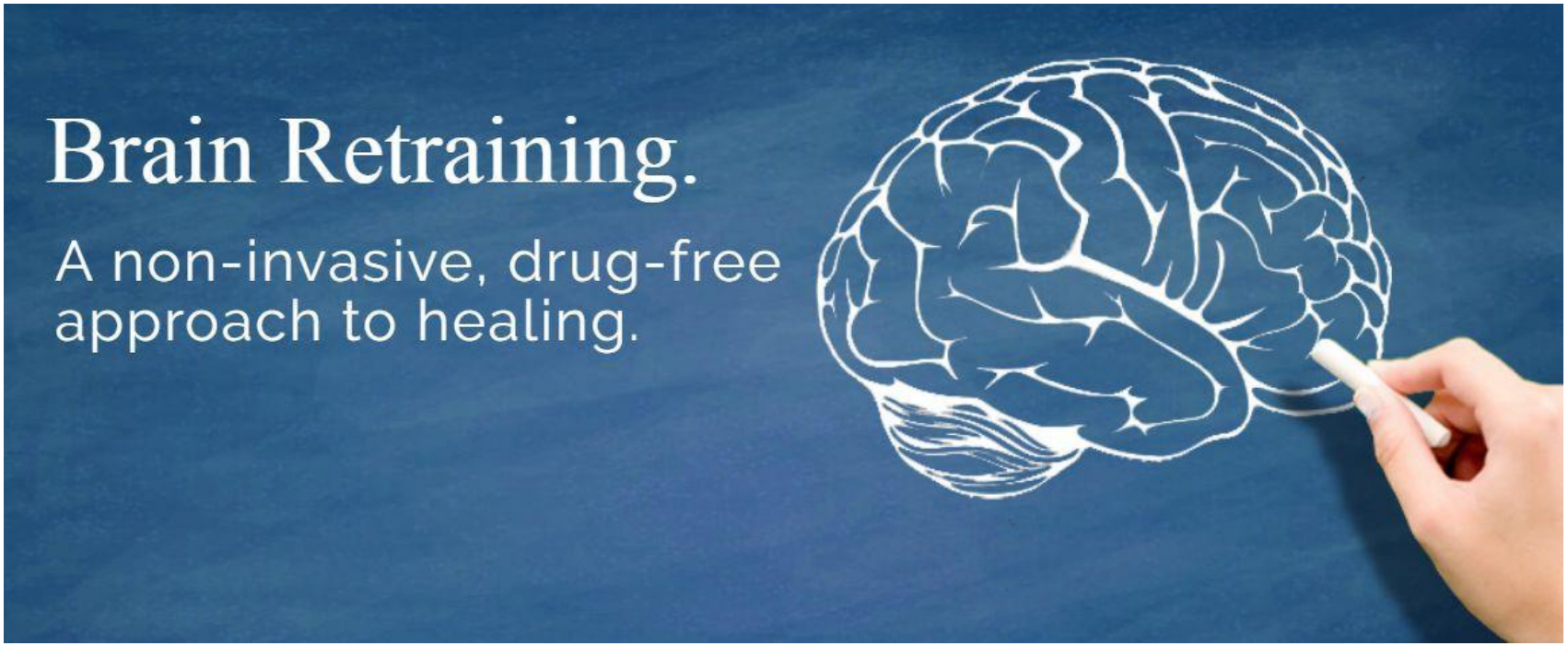
Liquid Minerals



Green Drink

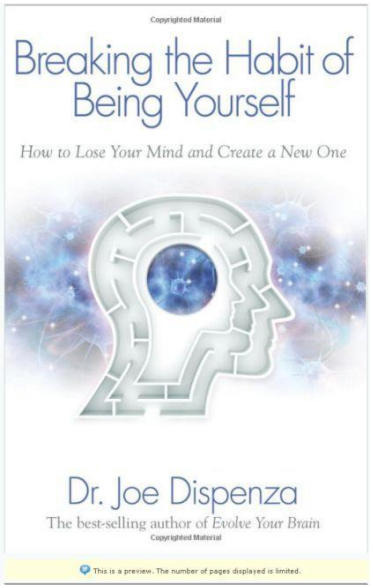
Liquid Vitamins

Dynamic Neural Retraining

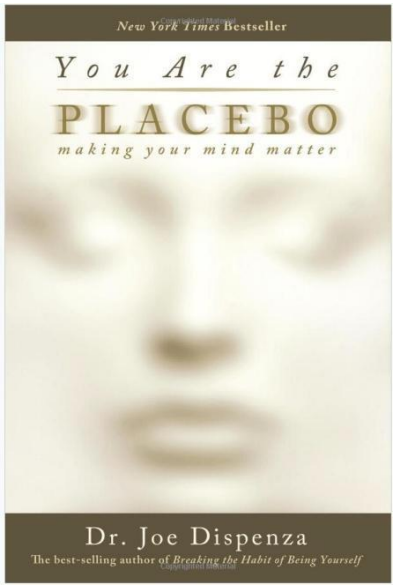


Several of my clients have tried this and were thrilled with the results.

Dynamic Neural Retraining



Amazon



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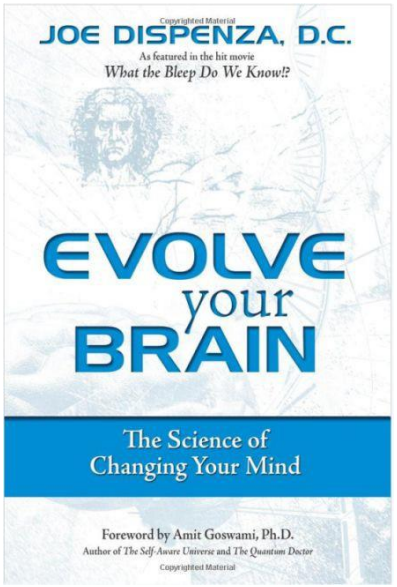


Amazon

Equipment Utilized in the Assessment

Gigahertz Solutions
HF59B RF Meter
w/ UBB27
Isotropic Antenna

Gigahertz Solutions
Directional Logarithmic
Periodic Antenna

Gigahertz Solutions
HFW59D

Siglent 3032X Spectrum Analyzer

AAronia V4 HF-60100 V4 is suitable for Pre-Compliance and EMC/EMI tests.
9KHz to 9.4 GHz Frequency Range

AAronia 4060 Log Periodic Antenna (400 MHz to 6 GHz)

Gigahertz Solutions
NFA 1000
Gaussmeter/Electric Field
Meter

Sperry
DSA600TRMS
Digital Clamp
Meter Ammeter

General Technologies Corp GTC
CM100 1 mA to 100 Amps
AC/DC low current clamp meter

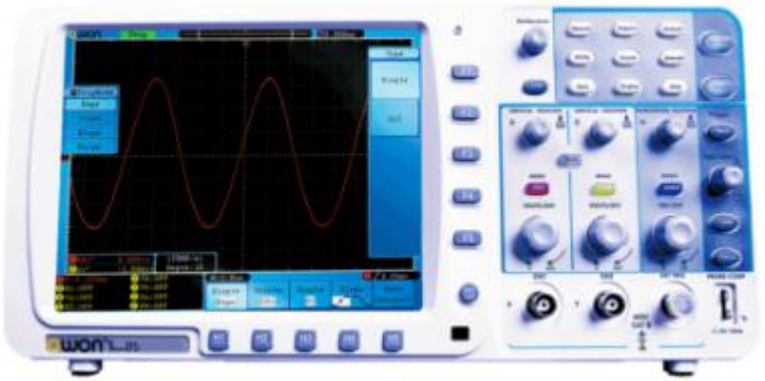
Stetzer
Dirty Electricity
Meter

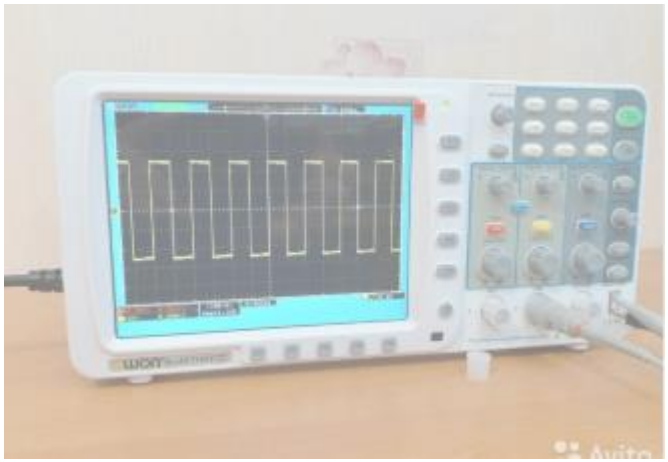
Extech 382252
Ground Resistance Meter

- Fluke 287 True RMS Logging Multimeter
- Auto and manual ranging, datalogging digital multimeter measures voltage, current, resistance, frequency, capacitance, temperature, conductance, pulse width, and duty cycle
- True RMS meter provides accurate readings when measuring linear or nonlinear loads where the current or voltage has a sinusoidal or non-sinusoidal waveform
- Datalogging features include minimum, maximum, and average, on screen graphing, real time clock, data hold, and data export to a computer

Pico 2408B

Oscilloscope/Spectrum Analyzer
w/interface kit.





OWON SDS7102V 100 MHz 2 Channel Oscilloscope

Warranty

Limited Warranty

DE Filters LLC warrants that this analysis was performed using substantially the methods that are referenced and described in this report. DE Filters LLC uses the principles of the Building Biology Intitule for the basis of recommendations made.

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Mobile Telecommunications and Health

Review of the current scientific research in view of precautionary health protection

April 2000

ECOLOG-Institut

Translated by
Andrea Klein

Mobile Telecommunications and Health

Review of the Current Scientific Research in view of Precautionary Health Protection

Commissioned by

T-Mobil
DeTeMobil Deutsche Telekom MobilNet GmbH

Authors

Dr Kerstin Hennies
Dr H.-Peter Neitzke
Dr Hartmut Voigt

With the support of

Dr Gisa-Kahle Anders

ECOLOG-Institut
für sozial-ökologische Forschung und Bildung gGmbH
Nieschlagstrasse 26
30449 Hannover
Tel. 0511-92456-46
Fax 0511-92456-48
Email mailbox@ecolog-institut.de

Hannover, April 2000

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1 Introduction

1.1 New Technologies and Precautionary Health Protection

No technology covering virtually entire countries with its emissions has ever been rolled out as quickly as mobile telecommunications. At the same time, there are only few direct studies of the potential health risks of typical mobile telecommunications frequencies and modulations for the exposed population. Also, many of the existing studies worked with high intensities, which will only be found in rare cases in the real environment. High intensities of high frequency electromagnetic fields can heat the absorbing tissue and trigger stress reactions in the body and thus with rising temperatures lead to thermal damage. Effects from high intensity high frequency EMFs, also know as thermal effects, on the central nervous system, the immune system, the cardio-vascular system and the reproductive system including teratogenic effects, have been proven for mammals with a multitude of experiments.

The results of studies of the thermal effects of high frequency EMFs form the basis of the recommendations of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), which, in the past, were the basis for the guidelines set by the government in Germany and many other countries. The base guideline was an upper limit on the Specific Absorption Rate (SAR), i.e. the amount of energy absorbed by the body from the field within a given unit of time.

According to ICNIRP, thermal damage will not occur at SAR values of under 4 W/kg and exposure levels of 0.4 W/kg for professional exposures and 0.08W/kg for the general population are considered safe.

Parallel to the experiments examining thermal effects, there have been a growing number of studies examining the effects on the body of HF EMFs at sub-thermal intensities. We now have a plethora of experimental studies examining a variety of effects on all levels of the organism, ranging from effects on single cells to effects which manifest themselves as reactions of the entire body. In addition to the experimental studies, there have been a number of epidemiological studies in order to establish the possible causal correlations between higher exposures to HF EMFs, for example as found near base stations, and health damage amongst the population groups with higher exposures.

The mobile telecommunications situation reflects, once again, the dilemma already known from chemical toxicology: The study of potential health effects cannot generally compete with the speed of technical development and the roll out of the product. The extremely fast roll out of the mobile telecommunications technology and the accompanying public fear of the potential danger of this technology have stimulated research insofar that now we have more studies examining the effects of frequencies and modulations as used in mobile telecommunications on biological systems. There are also a growing number of experiments using lower intensities, reflecting the real conditions of exposure in the vicinity of base stations and equipment, so that effects found in the studies can be extrapolated into real life conditions. The number of studies which examine the

physiological effects of real mobile exposures is still very low, compared to the degree of penetration achieved by the technology and the number of (potentially) exposed persons. The WHO amongst others, have only recently begun to develop targeted strategies to examine the potential health risk from mobile telecommunications and results can earliest be expected within several years.

In the meantime, it is only possible to assess the potential dangers of mobile telecommunications using the results generated by uncoordinated research, which is still mainly orientated towards topics and criteria of relevant to science only, rather than addressing the requirements of society as a whole.

Faced with a state of incomplete scientific research it is necessary to chose between two fundamentally different assessment theories when planning to assess the potential health risks of new technologies:

The first theory is based on the (without doubt correct) scholarly understanding that is practically impossible to prove the 'non-harmfulness' to human health or the environment of a technology, a material or a product. This understanding is interpreted in such a way that a presupposition of 'not guilty' is adopted and any risks have to be unequivocally proven.

'Unequivocal proof' in this context means the consistent evidence for a biological-physiological or an ecological chain of effects, from the biophysical or biochemical primary effect through to the physiological effects and the resulting illness or, if applicable, the ecological damage.

This theory, which is firmly based in scientific conservatism, has the advantage that it will stand up in court and will not hinder the introduction of new technologies. It is methodologically simple, since it is sufficient to examine studies which are presented as 'proof' with regards to their methodological correctness and their validity and then to put all these reviewed pieces of evidence together like a jigsaw to produce a whole picture. The complete whole picture finally constitutes the scientific proof required by the legislators and courts.

The disadvantage of this theory is obviously the length of time necessary to obtain enough knowledge for a completed chain of proof, during which many facts will be created, which may later prove irreversible or only reversible with very high costs attached, such as investments and irreversible damage to health and the environment.

The second theory solves the dilemma of the time delay. It is based on the assessment of the potential risks of a technology on the basis of existing knowledge. If there are sufficient indications that there may be damaging effects, the precautionary principle for the protection of health and the environment will apply and avoidable exposures will be avoided until such time when there is enough knowledge for a wider introduction of the technology in question. This theory draws its justification not least from the experiences with the introduction of technologies and products (such as asbestos, DDT, CFCs, formaldehyde, wood preservatives, mass X-ray screenings etc.), which were widely used, even many years after the first clear indications of health and ecological damage had appeared. When finally sufficient scientific proof for the health and ecological damage

was provided, it took many more years until the further use was finally reduced and banned through the courts and international negotiations.

The advantage of the precautionary principle is of course primarily medical and ecological, since exposures are initially limited to a level recognised as safe under the precautionary principle. But it can also offer economical advantages, because firstly, it may prevent potentially highly risky investments, but also secondly, because the commitment to and observance of the precautionary principle will create trust within the general population and thus increase acceptance for the placing of emitting equipment.

On the other hand, it will be the industry – as the owner of emitting equipment – who has to bear the disadvantage of this principle, when it becomes clear that, for precautionary reasons, an economically and technically perfectly-suited site can't be approved, or maybe even an entire technology has to be abandoned.

Furthermore, the methodological difficulties of this theory must not be underestimated, since it is not enough to prove the reliability of single scientific studies, which is just as essential under this premise as under the first theory. The ultimate goal however is – to remain with the jigsaw analogy – to put the existing jigsaw pieces together and recognise early on which pictures might appear once the work is completed.

1.2 Terms of Reference and Structure of the Review

The aim of this study was the assessment of the potential risks of electromagnetic fields as they are used for mobile telecommunications with respect to precautionary health protection. To this aim, the scientific literature was reviewed with regards to study results which might be of importance to the assessment of potential health risks from mobile telecommunications.

To create a base for later scientific discussion, a list of studies which are particularly important in this respect should be created. On the basis of these papers, the health risk from exposure to electromagnetic fields from mobile telecommunications should be assessed. Finally, recommendations for future scientific studies should be formulated.

The methodological aspects of this examination are presented in Chapter 2. This is followed by a review of the current scientific knowledge of the effects of high frequency electromagnetic fields. This review is structured according to the different levels of effects:

- biophysical and biochemical primary effects of HF fields on organic matter as a whole or at the level of cells and membranes (Chapter 3)
- primary biological effects on the cellular level, i.e. on the genetic substance and on intracellular processes as well as cell transformation and cell proliferation (Chapter 4)
- patho-physiological effects, i.e. physiological effects with possible but not certain negative health implications (Chapter 5)
- pathological effects, which means manifested illness and other effects such as the damage of cognitive functions, which have been found in epidemiological or experimental studies (Chapter 6).

The conclusions of all findings are drawn in Chapter 7. In Chapter 8, we make recommendations for precautionary health protection with regards to exposures to the electromagnetic fields of mobile telecommunications and for focal points for further research.

2 Collating and Interpreting the Scientific Data (Methodology)

2.1 Criteria for the Selection of Papers

In order to include a maximum of relevant literature, we analysed the literature we have catalogued in our own database, EMFbase, as well as exploring the three following paths:

- research in other relevant scientific databases
- complete sifting of at least the last two full years' issues of all relevant scientific journals available in the Central Library of Medicine in Cologne, the Technical Information Library in Hanover, and the Library of the Medical University of Hanover
- evaluation of all existing monographs, reviews and conference reports related to the subject matter

The basic literature research was finished in February 2000.

Literature databases are a convenient research tool, but their value in assessing the current scientific knowledge in a subject matter is limited by the number of registered publications, inconsistent use of keywords, the changing understanding of certain procedures, effects etc. and last but not least, due to long time delays between the time of publication and availability in the database. Furthermore, databases usually only keep abstracts of papers, and those differ often from the full text with regards to the presentation and interpretation of the results. Our research for this review confirmed this observation, reflecting the results of a study of Pitkin et al. (1999) according to which almost 40% of all papers published in the six largest medical journals contained inaccuracies and mistakes in the abstracts. To be at the cutting edge of scientific knowledge, it is necessary to research current scientific journals and find older papers via monographs and reviews. Reviews are only useful to gain an overview over a subject matter and as a source for literature leads. It is inappropriate to use assessments or interpretations of a review study since some authors of reviews will have based their conclusion on abstracts rather than the full texts of the papers they discuss.

2.2 Assessment Criteria

One sub-goal of the present paper was to identify those scientific papers which are particularly interesting for the assessment of potential health risks caused by the electromagnetic emissions of mobile telecommunications. (Extracts from our database EMFbase with a summary of the results of these papers can be found in Annex E. In the source references, these papers carry an asterisk*). Only peer reviewed papers published in scientific journals were included in our review. We also accorded weight to the 'Impact Factor', which is calculated by the Institute for Scientific Information in Philadelphia. This factor is a rough measure for the amount of importance and reputation attributed to a scientific journal in its subject matter.

The papers able to pass this first filter were subsequently interpreted according to the following criteria:

- carrier frequency or frequency range
- manner of modulation
- modulation frequency or frequency range
- power flux density
- specific Absorption Rate
- electric filed strength
- duration of exposure
- other parameters of exposure (such as other fields [incl. ELF], ambient and if applicable body temperature, particular forms of modulation)
- source of exposure or environment of the exposure (such as antenna emitting freely, anechoic chamber, transmission line)
- object of experiments (human, animal, cell system)
- examined pathological results (manifested illness and other effects on the whole body)
- examined patho-physiological effects (physiological effects with a potential for health damage)
- examined biological effects (mostly on the cellular level)
- examined biophysical and biochemical processes (primary effects on the level of molecules, membranes etc.)
- methodology of the experiments (procedures used)
- results (including a mention if our own interpretations differ from those of the author)
- statistical significance of the results
- appropriateness of the model (with regards to the statements made about effects on humans)
- appropriateness of the methodology (methodical weakness analysis)
- documentation of the conditions of the experiments (completeness, reproducibility)
- context of other experiments (mention of experiments with the same or contradicting results)
- meaning (Main conclusions drawn from the results, importance for the assessment of health risks for humans)

Because of the delay of science with regards to the electromagnetic frequencies emitted by mobile telecommunications, a risk analysis cannot be limited to the frequencies and

modulations actually used by this technology. Therefore, we have included all papers examining carrier frequencies from 100MHz to 10GHz. In the experiments at cellular level, but also in animal experiments, effects have been found that only appear at certain modulations or are a lot stronger at these modulations (chapter 3 and 4). At this point in time it is not possible to determine whether the majority of the found effects are caused by the HF carrier wave or the modulation. This is why we have included all forms of modulation into this review. Because of the nature and the importance of the so-called 'thermal effects' (chapter 3.1) we have not set an exclusion limit for power flux density and Specific Absorption Rate. However, we did not include papers, in which the EMF exposure led to a considerable rise in body temperature (>1ºC) of the animals or human subjects.

When evaluating the papers, we kept making the following observations:

- important single results are 'masked' for example when data are 'pooled'
- certain observations are dismissed by the authors as 'blips' if they don't fit the (expected/otherwise observed) general trend, without sufficient explanation being offered for this dismissal
- single results are not taken into account for statistical reasons, but a common trend is not recognised or not sufficiently acknowledged.

In such cases, whenever this was possible based on the existing data, we proceeded to make our own interpretations. Where our evaluation differed from the main statements of the authors, it will be noted.

3 Primary Reciprocal Effects between High Frequency Electromagnetic Fields and Biological Systems (Biophysical and Biochemical Processes)

3.1 Thermal Effects

3.1.1 Effects of Homogenous Warming

HF electromagnetic fields are absorbed depending on the frequency and polarisation of the fields on the one hand and the dimensions and material characteristics of the biological system on the other hand. They cause electric currents (dominant in the range under 1 MHz), polarisation effects and potential differences on cell membranes (in the range between 1 MHz and 100 MHz) or trigger rotational oscillations of polar molecules (mainly within the GHz range). All these processes can lead to a warming of the biological material if the intensity is sufficient (Ohmic losses in the low frequency range and dielectrical losses in the GHz range). The avoidance of health-damaging warming is the base of the concept of SAR, expressed by limiting the specific absorption rate, measured as the energy absorption per unit, to a rate which will exclude overheating based on the body's own thermo-regulative processes. For humans, a whole body exposure of 0.4 W/kg corresponds approximately to half the metabolic base rate. In absence of heat conduction or other thermal dissipation, a SAR of 0.4 W/kg will lead to a temperature rise of 10^{-4}K/sek (Foster 1996) in soft tissue like muscles or the brain.

3.1.2 Microthermal Effects

The warming through microwaves is fundamentally different from the warming through a water bath for example. In the latter case the energy is transmitted by stochastic collisions. In microwave heating it is in the simplest case the electrical component which puts polar molecules within the medium collectively in vibration (3.2.1). Because of 'friction' with the dense ambient medium, the energy is quickly transmitted to this medium and further dissipated by collisions. When corresponding inner molecular degrees of freedom exist, the microwave energy can also be absorbed as a quantum and, in a large molecule, stored (3.3.). Compared to conventional warming, the absorption of a microwave quantum is a singular process, which can lead to localised warming if the absorbing molecules are suitably distributed. Liu & Cleary (1995) show in a theoretical model that at the cellular level, membrane-bound water can lead to frequency dependent spatial discrepancies in dissipation of the SAR and the induced HF fields.

Microthermal effects can also be caused by the non-uniformity of thermal conductivity of tissue at microscopic level, especially when the warming is short, strong and local. This is of importance mainly for the evaluation of pulsed fields, because in such fields, even at a low average power flux density, the energy absorbed during a pulse can be very high. Radiation in the form of short pulses can lead to a very high rate of temperature rise, which can itself trigger thermoelastic waves, a phenomenon, which is inked to the

acoustic perception of microwaves. A high peak-SAR can also trigger thermally-induced membrane phenomena (Foster 1996).

3.2 Direct Field Effects

3.2.1 Effects from the Electrical Component of the Electromagnetic Field

The electric component of the electromagnetic field exerts a force on electrical charges, permanent dipole moments, induced dipole moments and higher multipole moments. The forces on charges create currents, however these only play a role in the lower HF range, causing changes in membrane potentials (stimulation) or thermal effects (see above).

Permanent charge distributions in biomolecules and cells lead to permanent dipole (or higher multipole) moments. The electrical field exerts a torque on dipoles, which tries to align the dipole moment parallel to the field. In alternating fields with not too high frequencies, the interactions lead to oscillations of the dipoles. In dense media, these oscillations are hindered by interactions with the surrounding particles, which lead to heating (see above). If the particles are too large or the surrounding particle density is too high or if the frequency of the field is too high, the oscillations cannot develop.

The threshold field strengths for the orientation of dipolar cells and other objects of similar size (radius of approx. 1 μm) are at 100 V/m, the cut-off frequencies in water (temperature 300K) are at circa 0.05Hz, hence far outside the HF range. DNA molecules and other bio-polymers can be put into oscillation by fields with frequencies in the kHz range. Spherical protein molecules (radius approx. 5nm) can still follow fields with frequencies up to 400 kHz, however this requires field strengths of 10^6V/m (Foster 1996). Such field strengths are not usually reached in the environment.

The interaction between a field and a particle with an induced dipole moment depends on the field strength to the power of 2, that means, a continuous electrical alternating field influences the particle via a constant torque, however the torque of a modulated field follows the modulation. There is no limitation through a cut-off frequency for the interaction between a field and an induced dipole moment, however for frequencies over 1 MHz, the forces exerted on the cells are very small unless field strengths of several thousand V/m are used. With such field strengths however, strong dielectrophoretic forces appear, which can lead to cell deformations, to the orientation of non-spherical cells and to the so-called coin roll effect, a stringing together of cells. Since the induced dipole moment depends on the polarizability of the particle and the latter on the size of the particle, even higher field strengths are needed for smaller bodies than cells (biopolymers).

Electric fields can induce electrical potentials on cell membranes. The size of these potentials depends on the electric field strength, the dimensions of the cell, the frequency of the field, the electrical conductivity within and outside of the cell as well as the capacitance of the cell membrane.

With frequencies above 1 MHz the membrane is practically short-circuited and the induced membrane potentials become very small. However, theoretical rectification processes and non-linear phenomena at the cell membrane have been discussed, and these could lead to an intensification of the effect and to membrane potentials that have an effect on cell physiology.

3.2.2 Effects from the Magnetic Component of the Electromagnetic Field

With some exceptions, biological tissue is not magnetic and the mutual effects between the magnetic component of an electromagnetic field and tissue are generally small. However, the presence of magnetite crystals, which have a strong capacity to absorb the frequency range of 0.5 to 10 GHz which is relevant for mobile telecommunications, has been found in the human brain as well as in the tissue of many animals (*Kirschvink 1996). Under exposure to amplitude modulated or pulse modulated microwaves, the frequency of the crystal vibrations varies according to the modulation frequency, and thus transmits it, for example in the form of an acoustic wave onto the ambient medium and the cell membrane, which possibly leads to changes of the permeability of the membrane (*Kirschvink 1996). Theoretical calculations show that magnetite transmitted effects can only occur at high densities of superparamagnetic particles (*Dobson & St. Pierre 1998).

3.3 Quantum Effects

The quantum energy from radio and microwaves in the frequency range between 100 MHz to 10 GHz is far too low to break ionic, covalent or hydrogen bonds. Bohr et al. (*1997) have however shown theoretically, that wring resonances can be triggered in chain molecules. The frequencies of these resonances are in the range from 1 to 10 GHz for proteins and 10 MHz to 10 GHz for DNA molecules. The wring modes of molecules manifest themselves as 'torsions' in the molecule chain, which can lead to structural changes.

The influences of microwaves on structural changes in molecules have been found in experiments using the protein ß-Lactoglobuline (*Bohr & Bohr 2000). The triggering of resonant wring modes can even lead to chain breaks, since due to White's Theory, the added energy can be concentrated in a very limited part of the molecule during structural changes (*Bohr et al.). In this part, the chain can break.

3.4 Other Effects

Resonance Phenomena

When the frequency of the electromagnetic wave meets the natural vibrations in the cell structures or in tissue, it can lead to resonances. Rhythmical fluctuations of signal substances, matter-exchange-processes and Ion-conductivity can be found in many neurones, receptors and cell types. These oscillations can influence the membrane potentials and switch certain stimuli on and off. An external field – according to theory – can imprint an external oscillation frequency onto these structures. Neurones which have

been modified in this way can even synchronise the following neurones in the same way. This external synchronisation would even remain after the disappearance of the external stimulus.

Indirect Effects

In addition to the previously described triggering of wring resonances, microwaves can possibly damage the genetic substance via the formation of hydroxyl radicals. The input energy of microwaves is sufficient to raise the ratio of oxidants to anti-oxidants, a self-accelerating chain reaction of free radicals can lead to damage of the DNA (Scott 1992, see also Maes et al. 1995).

3.5 Particular Properties of Pulsed Electromagnetic Fields

In an evaluation of circa 40 studies, in which the biological effects of pulsed high frequency fields were directly compared to those of continuous fields of the same median power density, Postow & Swicord (1996) concluded that in half of the studies, the biological effectiveness of pulsed fields was significantly higher. Only in a few studies were the continuous fields more effective and in the remainder of the studies the effectiveness of both was practically the same. The studies which are mainly discussed in chapter 4 and 5 convey a similar picture.

At first glance, the higher biological effectiveness of pulsed electromagnetic fields in comparison to continuous fields at the same median power flux densities could have an almost trivial cause:

The individual pulses of pulse modulated fields have a higher amplitude than the continuous fields; the possible threshold for the triggering of biological reactions could therefore be passed in these fields during the duration of the pulse.

However, numerous experiments found that the biological response depends in a complicated manner on the duration of the pulse and its frequency. Given that some effects have only been observed at certain pulse frequencies, we presume that in addition to the described effect, there are others which can be originally attributed to the low frequency modulation (see also chapter 4).

4 Biological Primary Effects of High Frequency Electromagnetic Fields Effects on Cellular Level

At the cellular level, it is possible that there may be direct effects of the EM field on the genetic material, which we have collated under the heading Gene Toxicity and which will manifest as mutations if the cell's own repair mechanisms fail. On the other hand, it is also possible that the fields influence cellular processes such as gene-transcription and gene-translation. Furthermore it is possible that the fields can impact on the cell membranes, the intracellular processes of signal transmission and not least the cell cycle. Just like direct damage of the genetic substance, a disruption of these processes can lead to a transformation of the cell, to disruptions of inter-cellular communication and to a changed rate of cell division, which can lead to a slower – or very importantly with respect to a potential carcinogenic effect – faster growth.

4.1 Gene Toxicity

A basic question for the evaluation of the potential dangers of mobile telecommunication is whether the electromagnetic fields used are genotoxic. If the fields had the potential to damage genetic substance directly, they would not only amplify the effects of other carcinogenic teratogenic or mutagenic substances, but they would induce these effects themselves. A direct genotoxic effect of electromagnetic fields with frequencies as they are used for mobile telecommunications has been thought to be not likely in the past (Brusick et al. 1998, Moulder et al. 1999, Repacholi 1997, Repacholi 1998, Saunders et al.1991, Verschaeve 1995, Verschaeve & Maes 1998). The reasons for this assumption were on the one hand that the quantum energy contained in EM field in the radio and microwave range was not sufficient to break molecular bonds. This assumption is no longer tenable after the experiments of Bohr et al. (*1997) and Bohr & Bohr (*2000) (see also chapter 3.3). On the other hand, it was argued that there was a large number of experiments showing no genotoxic effects. Our list of papers in Annex A, Table A.1 shows however, that the much debated findings of the work of Lai & Singh (*1995), in which the direct damage of DNA (single strand and double strand breaks) has been proven, have been confirmed by a whole range of other studies, some by the same laboratory, but also by other groups (*Lai & Singh 1996, 1997, *Phillips 1998, *Sarkar 1994). A study by Varma & Traboulay (1977) on the effect of HF fields on pure DNA had already resulted in hints of direct genotoxic effects, however, this experiment used a relatively high power flux density and therefore significant warming may have occurred, at least locally. Lai and Singh (*1997) found that the dispensation of melatonin and N-Tert-Butylalpha-Phenylnitron (PBN) before the EMF exposure prevented the occurrence of DNA breaks. Melatonin captures free radicals and for PBN it has been proven that it protects cells from cell death induced by free radicals.

In Appendix Table A.1 we also list the experiment of Meltz et al. (*1987) and Stagg et al. (*1997) which examined the influences of EMF fields on the DNA repair mechanisms and the DNA synthesis.

The term chromosome aberration sums up all anomalies of the DNA double strand level with respect to chromatids and chromosomes. Examples for structural chromosome aberrations are: chromatid and chromosome breaks, chromatid gaps, acentric fragments as well as di- and tetracentric chromosomes.

Chromosome aberrations have been observed in a multitude of experimental conditions, *in vivo* as well as *in vitro* (Table A.1). Maes et al.(*1997) found a rise of chromosome aberrations in human lymphocytes in workers who were professionally exposed to radiation from mobile equipment, but also in experiments with human blood under controlled exposure conditions (GSM base station, 15 W/m², exposure time of 2 hours). However, this was the only study so far which used the actual fields of a real base station.

The incidence of micronuclei indicates whether the distribution of chromosomes into the daughter nuclei after a cell division has been normal and complete. A number of studies have proven a higher incidence of micronuclei under the influence of HF EMF fields, which is interpreted as an indication for chromosome damage (Table A.1). With one exception, the frequencies were all over 1 GHz and in most cases the intensities were relatively high.

For the incidence of sister chromatid exchange as a measure for damage at DNA single strand level, only very few studies using typical mobile frequencies and intensities have been done so far (Table A.1). Maes et al.(*1996) found that the radiation of a GSM base station (954 MHz, 217 Hz, duration of exposure: 2 hours) raises the genotoxic effects of Mitomycin C significantly, demonstrated via the sister chromatid exchange.

Genetic damage can lead to cell mutation with possibly damaging effects for the living organism. Mutations which promote faster cell division will be discussed in chapter 4.3. Table A.1 shows in its last block some studies which focussed on the evidence of changes in the genetic materials which manifest themselves as changed properties within the organism.

4.2 Cellular Processes

4.2.1 Gene-Transcription and Gene-Translation

The code of the DNA controls protein synthesis in the ribosomes via the RNA. The creation of RNA, i.e. the imprinting of genetic information happens in the cell nucleus (transcription). The encoded information is transported via messenger-RNA (M-RNA) to the ribosomes and is read there with the help of Transfer RNA (t-RNA). According to the transmitted code, proteins are subsequently synthesized. This process of synthesis is called translation. Since one m-RNA chain can be used by several ribosomes, the rate of synthesis of the corresponding protein can be a lot higher than that of the m-RNA. Mistakes made during the genetic transcription can thus be ‘raised to a higher power’ at the protein level.

In the first block of Appendix Table A.2, we list several recent studies which demonstrated changes of gene transcription and translation under the influence of electromagnetic fields of mobile telecommunications. Fritze et al. (*1997) observed

changed gene transcription in certain areas of the brains of rats which had been exposed to the field of a GSM phone for four hours.

In an *in vitro* experiment, Ivaschuk et al. (*1997) exposed cells to a pulse modulated HF field (836.55 MHz, TDMA 50Hz) and afterwards extracted and analysed the entire cellular RNA.

This showed statistically significant changes with regards to the transcription of the response gene *c-jun* (90W/m², duration of exposure: 20 minutes), however no changes with regards to *c-fos*. The results of the experiments by Goswami et al. (*1999) found a evidence for an influence on the transcription of the response gene *c-fos* by a similar field, whilst for *c-jun* and *c-myc*, no statistically significant effect was observed. The intensities at which effects on gene translation had been observed were well below the values at which thermal effects would occur in mammals.

4.2.2 Membrane Function

There is a large number of experimental evidence that high frequency fields, non-pulsed and pulsed can affect different properties of the ion channels in cell membranes, for example in the form of a lowering of the rate of channel formation or the reduction of frequency of the opening of individual channels (Repacholi 1998). The frequency of openings of ion channels which are activated by acetylcholine was significantly lowered by a microwave field (10.75 GHz) with a power flux density of a few μW/cm². (*D'Inzeo et al.1988). Changes of the membranes as a whole have also been observed under the influence of weak fields. Thus, Phelan et al. (*1992) observed that a 2.45 GHz field, with a pulse modulation of 100 Hz could trigger a phase transition from liquid to solid in melatonin containing cells after an exposure of 1 hour at a SAR of 0.2 W/kg.

4.2.3 Signal Transduction

Ca^{2+}

The divalent Calcium cation Ca^{2+} plays an important role in the cell-signal-transduction: regulating the energy output, the cellular metabolism and the phenotypical expression of cell characteristics.

The signal function of the Ca^{2+} is based on a complicated network of cellular channels and transport mechanisms, which maintains the Ca^{2+} concentration within the cell at a lower level than outside, but which is also linked to dynamic reservoirs. This allows the transduction of extracellular signals (hormones, growth factors) as Ca^{2+} peaks in the cytosol, transmitting information encoded in their intensity and frequency. It is known that this signal process can be disrupted by a variety of toxic chemicals in the environment, which can lead to cell damage and even cell death (Kass & Orrenius 1999).

Studies by Bawin et al. (*1975) and Blackman et al. (*1979) showed very early on *in vitro* experiments that the Ca^{2+} balance of nerve cells and brain tissue can be disrupted by HF fields with low frequency amplitude modulations.

Both studies worked with amplitude modulated 147 MHz fields (with intensities ranging from 5 to 20 W/m^2). The maximum effect occurred at a modulation frequency of 16 Hz. Experiments conducted by Dutta et al. (*1984 *1989) and Lin-Liu & Adey (*1982) also showed significant dependence on the modulation frequencies, in some cases at Specific Absorption Rates of as low as 0.5 W/kg. Equally, Somosy et al. (*1993) found that an effect on the distribution of Ca in intestinal cells is only possible within a field modulated with a low frequency. Wolke et al. (*1996) observed in their experiment on myocytes that exposure to fields with mobile-like carrier frequencies of 900 MHz and 1800 MHz resulted in lower intracellular concentrations of Ca^{2+} for all modulation frequencies (16 Hz, 50 Hz, 217 Hz, 30 KHz) compared to exposures to a continuous 900 MHz field or no exposure at all. A statistically significant effect was only found with the combination of a carrier wave of 900MHz and a modulation frequency of 50 Hz. The Specific Absorption Rate for this experiment was between 0.01 and 0.034 W/kg, far below the range which might be relevant for 'thermal' effects.

Enzymes

Protein kinases are enzymes with the property to phosphorylate other enzymes or proteins. Phosphorylation, a covalent modification by addition of a phosphate group, changes the activity or function of a protein. The protein kinases play an important role in the transmission of information from the membrane receptors for hormones and cytokines into the interior of the cell, and thus in the regulation of many intracellular processes such as glucose and lipid metabolisms, protein synthesis, membrane permeability, enzyme intake and transformation by viruses.

An amplitude modulated 450 MHz field is capable of decreasing the activity of protein kinases which are not activated by cyclical Adenosine monophosphate. Byus et al. (*1984) showed that the degree of inactivity depended on the exposure time as well as the modulation frequency. Maximum effects occurred at exposure times of 15 to 30 minutes with a modulation frequency of 16 Hz.

The enzyme ornithine decarboxylase (ODC) determines the speed of the biosynthesis of polyamines. Polyamines are needed for DNA synthesis and cell growth. ODC is also activated in relation to carcinogenesis. The control of OCD activity from the exterior is facilitated via processes on the cell membrane. Byus et al. (*1988) exposed three different cell types (rat hepatoma cells, egg cells of the Chinese hamster, human melanoma cells) for one hour to a 450 MHz field with a 16 Hz amplitude modulation and a power flux density of 10W/m^2. The exposure raised ODC activity by a little more than 50%. The heightened ODC activity remained for several hours after the exposure. Similar fields with a 60 Hz and a 100 Hz modulation had no effects. Another study (*Penafiel et al. 1997) observed heightened ODC activity after the radiation of L929-cells of mice with a 835 MHz field which had been amplitude modulated at 60Hz or pulse modulated at 50Hz. No effects whatsoever were observed with an analogue mobile phone, a frequency modulation at 60 Hz and a speech amplitude modulation. This last finding confirms other results by the same group, according to which a minimum coherence time of 10 seconds of the field needs to be present for an effect on ODC activity to manifest (*Litovitz et al.1993, 1997, see also Glaser 1998 and Litovitz 1998). The coherence time of speech modulated fields however is shorter than a second.

Further important proof that low frequency modulation has a determining influence on the effects of electromagnetic fields on enzyme activity was found by Dutta et al. (*1994): They compared the effects of a low frequency modulated 147 Hz field (0.05 W/kg) and a combined low frequency electric and magnetic field (ELF EM, 21.2V/97nT). A continuous high frequency field only had a small effect (3.6 per cent) on the activity of enolase in *Escheria Coli*, a 16 Hz modulated field led to an increase in activity of nearly 62 per cent, a 60 Hz modulated field led to a decrease of activity of 28.5 per cent. At ELF-EM a similar response could be observed: increase of enzyme activity by more than 59 per cent at a frequency of 16 Hz and decrease of 24 per cent at 60 Hz. The results of the experiments by Behari et al.(*1998) point in the same direction. They found that a 30 to 35 day long exposure of rats to amplitude modulated fields (6.11 – 9.65 W/kg) led to a significant increase in Na^+-K^+-ATPase activity, which was independent from the carrier frequency, but characteristically dependent on the modulation frequency, because the effect was always stronger at a 16 Hz modulation than at a 76 Hz modulation.

4.2.4 Cell Cycle

An undisrupted signal transduction or efficient cell cycle control mechanisms which are capable of correcting false information or facilitating repairs are the prerequisite for cell cycle progression if the genomic integrity of the cell is to be maintained (Shackelford et al. 1999). Disturbances of the DNA replication can lead to detrimental mutations and as a consequence to cell death or in multicellular organisms to cancer. The causes for irregularities in the course of the cell cycle are almost always to be found in mistakes during signal transduction and/or the failure of control mechanisms.

In Appendix Table A.2. we list studies which examined disruption of the cell cycle. The only *in vivo* experiment is the one by Mankowska et al. (*1979) which also used intensities as they are found in the environment of real emitting equipment. Statistically significant increases of disrupted metaphases with uni-, quadri- and hexavalencies were demonstrated in this study from a power flux density of 5 W/m^2.

Cleary et al. (81996) found in their experiment that 2.45 GHz fields are roughly twice as effective as 27 MHz fields when it comes to the triggering of cell cycle disturbances. Whilst the 27 MHz fields had no influence on the G2/M phase of egg cells of the Chinese hamster, disturbances of all phases were observed in a 2.45 GHz field.

4.3 Cell Transformation and Cell Proliferation

In vitro experiments of the effects of high frequency fields on the rate or division or the rate of proliferation of cells, expressed in the proliferation rate and the (neoplastic) transformation of cells can offer important findings with regards to possible carcinogenic effects of the fields. The adverse influences of the fields which could not be prevented by the cell's own repair mechanisms manifest themselves in disrupted cell proliferation and cell transformation rates.

Table A.3 gives an overview of the studies, in which the effects of high frequency fields on cell transformation and cell proliferation rates were the focus of the examinations.

4.3.1 Cell Transformation

Balzer-Kubiczek & Harrison (*1985, *1989, *1991) found an increase in neoplastic transformations in cells which had been exposed *in vitro* to a high frequency field with a low frequency pulse. The effect depended on intensity, but was only observable, if a tumour promoter (TPA) was added after the exposure.

Czerska et al. (*1992) found that low frequency pulsed microwave radiation (2.45 GHz) increased the rate of transformation of small inactive lymphocytes into large activated lymphoblasts. Continuous radiation could trigger this effect only at power flux densities that also led to measurable warming.

However, the experiments with pulsed radiation which triggered the cell transformation at power flux densities, for which a homogenous warming can be ruled out, showed that homogenous warming cannot be responsible for this effect.

4.3.2 Cell Communication

Disrupted communication between transformed cells and normal cells plays an important role in tumor promotion. Cain et al. (*1997) co-cultivated transformed cells with normal cells. The co-culture was exposed for 28 days to a TDMA (50Hz) modulated 836.55 MHz field as well as to the tumor promoter TPA in various concentrations. At power flux densities of 3 and 30 W/m^2, which corresponded to Specific Absorption Rates of 1.5 and 15 mW/kg, they did not find a statistically significant difference of focus formation between the exposed and the control cultures for any of the TPA concentrations. The data for the lowest intensity (0.3 W/m^2/0.15 mW/kg) show for two of the three TPA concentrations that there was a small but statistically significant difference in the number of foci, and for the lowest TPA concentration also for the surface and density of the foci.

4.3.3 Cell Proliferation

Anderstam et al. (*1983) found in their experiments with bacteria that some strains reacted to the exposure with an amplitude modulated 2.45 GHz field (500Hz, 35 to 100 W/kg) with an increased proliferation. Also for some species, the number of mutations and the frequency of mutations were increased. These results were confirmed by Hamnerius et al. (*1985) amongst others. Grospietsch et al. (1995) found similar results for 150 MHz fields with several amplitude modulations.

Cleary et al. (*1990 a,b) demonstrated on human lymphocytes and on Glioma cells that the rate of cell division was increased after exposure with a continuous 2.45 GHz field. In a newer experiment, the same effect could be observed for exposures with a pulse modulated field of the same carrier frequency (*Cleary et al. 1996).

In the first of the two experiments which were conducted with fields displaying all the characteristics of real pulsed mobile emissions (see also Table A.3), an increased DNA synthesis rate was observed, but no faster proliferation of the examined cells was found. (*Stagg et al. 1997). In the second experiment, at similarly low intensities (0.0021 W/kg) however, transmitted by a GSM modulated 960 MHz wave, an increase of the cell

proliferation rate was found (*Velizarov et al. 1999). The EMF exposure in this experiment was conducted at two different temperatures, which also applied to the relating control cultures. The increase of the proliferation rate only happened in the exposed cell cultures. Similar experiments to prove that microwaves and 'conventional' heat have different effects, were conducted by La Cara et al. (*1999) on a thermophile bacterium, in which the radiation with a 10.4 GHz field led to an irreversible inactivation of the thermostable enzyme ß-galactosidase, whilst heating in a water bath had no effect. This result confirmed the results of Saffer & Profenno (*1992) which had worked with frequencies in the lower GHz range.

5 Patho-Physiological Effects

5.1 Immune System

The immune system plays a central role in the protection against infectious micro-organisms in the environment and, also, against several kinds of cancer cells. Experiments on hamsters, mice and rats found, amongst other things, that there was a reduction in the activity of natural killer cells and an increase in macrophage activity (see e.g. Yang et al. 1983; Ramo Rao et al. 1983; Smialowicz et al. 1983). However, the majority of experiments on living animals were carried out at power flux density levels that produced an increase in body temperature of more than 1°C. On the other hand, it was observed in parallel *in vitro* experiments, that *in vitro* heating of macrophages did indeed lead to increased activity; the effect was, however, weaker than that of the *in vivo* radiation which produced the same temperature (Ramo Rao et al. 1983).

Elekes et al. (*1996) observed that, after exposing mice for a period of 3 hours per day over several days using microwaves (2.45 GHz) with a power flux density of 1W/m² (SAR = 0.14 W/kg), there was an increase in antibody-producing cells in the spleen of about 37% with continuous radiation and around 55% with amplitude-modulated radiation.

In contrast to the *in vivo* experiments, numerous *in vitro* experiments were carried out with intensities at which an effect due to warming can be excluded. Thus, Lyle et al. (*1983) observed an inhibition of cytotoxicity of T-Lymphocytes in the mouse with a 450 MHz field that was amplitude modulated with various frequencies in the range between 3Hz to 100 Hz. The effect that was demonstrated with a relatively low power flux density of 15 W/m² was greatest at the 60 Hz modulation. The inhibition of cytotoxic effectiveness of the irradiated lymphocytes declined continually for both the lower and higher modulation frequencies.

The tables in Appendix A list further experiments with (human) leucocytes in which damaging effects were proven at non-thermal power flux density levels, especially also with low frequency amplitude modulated fields.

The work of Maes et al.(*1995) deserves special consideration. In an *in vitro* experiment with human leucocytes at a GSM base station and also in the examination of the lymphocytes in the blood of workers who were exposed to the fields of the mobile phone base stations during maintenance work, they found that there was an increase in chromosome damage (chromatid breakage, acentric fragments and some chromosome breaks).

5.2 Central Nervous System

5.2.1 Blood Brain Barrier

The brain of mammals is protected from potentially dangerous materials in the blood by the blood brain barrier, a specialized neurovascular complex. The blood brain barrier

functions as a selective hydrophobic filter that can only be easily passed through by small fat-soluble molecules. Other non fat-soluble molecules, e.g. glucose, can pass through the filter with the help of carrier proteins that have a high affinity for specific molecules.

It is known that a large number of disorders of the central nervous system are caused by disturbances of the barrier function of the blood brain barrier (*Salford et al. 1994).

Severe warming of the brain can lead to an increased permeability of the blood-brain barrier for those materials whose passage should actually be prevented. The results of first experiments with high frequency fields of high intensity, which led to a higher permeability of the blood brain barrier, were then interpreted as a consequence of warming by the HF radiation.

However, Appendix Table B.1 lists a whole series of studies in which a greatly increased permeability of the blood brain barrier was produced through pulsed high frequency fields of very low intensity (*Oscar & Hawkins 1977, *Neubauer et al. 1990, *Salford et al.1994, *Fritze et al.1997) amongst others with carrier frequencies and modulation frequencies which corresponded to those of mobile telephony (GSM).

5.2.2 Neurotransmitters

Pulsed and continuous high frequency fields of low intensity may lead to chemical changes in the brain. Inaba et al. (*1992) exposed rats to a continuous 2.45 GHz field with a power flux density of between 50 to 100 W/m2 and found a significant reduction in the Noradrenalin content of the Hypothalamus, whilst the two other neurotransmitters Dihydroxyphenylacetic acid and 5-Hydroxyindolacetic acid were found in the pons and medulla oblongata in significantly increased concentrations. The radiation did not produce significant changes in the dopamine or serotonin concentrations.

Lai et al. (*1987, 1989 a, b, see above Lai et al. 1988) found also in experiments using rats that a 2.45 GHz field modulated with 500 Hz pulse-modulation influences brain activity, especially in the frontal cortex and the hippocampus, via the most important parasympathetic neurotransmitter acetylcholine. It could be demonstrated that the effect was related to the exposure duration. A 45 minute exposure duration led to significant reductions in choline-uptake, the reduction to 20 minutes exposure produced a significant increase. A similar behaviour was found in animals also as a reaction to stress through the reduction of the freedom of movement and through acoustic white noise.

5.2.3 Electroencephalogram (EEG)

In contrast to the neuroendocrine effects, which can barely be measured directly in the brain of humans, EEG studies can be carried out relatively easily. Several valid studies of that kind do now exist.

Most animal experiments have limited validity, since they were carried out with relatively high power flux density values (see e.g. Chizhenkova 1988: 2.397 MHz, cw, 400 W/m^2, Chizhenkova & Safroshkina 1996: 799 MHz, cw, 400 W/m^2, Thuroczy et al. 1994; 2.45 GHz, AM 16 Hz, 100 W/m^2).

One of the few exceptions are the studies by Vorobyov et al. (*1997), who observed an increase on the left-right symmetry in the EEG in rats that were exposed to a 945 MHz field (AM, 4Hz, 1 to 2 W/m^2, within the first 20 seconds after the start of the exposure.

Early experiments by von Klitzing (1995) with EEG recording during the exposure of subjects to pulsed high frequency fields, that were similar to those of mobile telephone fields (150 MHz, 217 Hz, power flux density in the pulse in the brain at a 6 cm depth below 10^{-2} W/m^2), found changes in the awake EEG, these were called into question because of insufficient documentation.

In later experiments however, a clear effect was demonstrated in the awake and sleeping EEGs.

Reiser et al. (*1995) observed, both with exposures to a 150 MHz field (modulated frequency 9.6 Hz, peak power 0.5 mW, 4 cm distance, near-field conditions) and also in the field of a mobile telephone (902 MHz, modulation frequency 217 Hz, peak power 8W, 40 cm distance), a significant increase in the energy in the EEG frequency bands - Alpha, Beta 1 and Beta 2.

Experiments by Röschke & Mann (*1997) resulted in no significant difference in the EEGs for exposed and sham-exposed subjects under short exposure conditions (3.5 minutes, 900 MHz, GSM, 0.5 W/m2). However, the peak of approx. 9Hz in the presented averaged power density spectra of exposed subjects was clearly lower and narrower than for non-exposed subjects. The same authors (*Mann & Röschke 1996) demonstrated again in the field of a GSM mobile telephone (8W, distance 40 cm power flux density 0.5 W/m^2), a reduction of the time taken to fall asleep and a statistically significant reduction of the duration and the proportion of the REM sleep. Furthermore, the spectral analysis revealed an increased power density of the EEG signal during REM sleep above all in the 'Alpha' frequency band. The REM suppressive effect and the reduction of the time taken to fall asleep were also confirmed by the same research team (*Mann et al.1997, *Wagner et al. 1998). The study carried out in 1997 also found a significant increase in the cortisol concentration in the blood of humans exposed to a 900 MHz/217 Hz field with a power flux density value of 0.2 W/m^2. Systematic deviations were also observed for the Growth Hormone and Melatonin levels, but these did not reach significance level.

Whilst in the previously cited studies, changes in the sleep EEG could be demonstrated only as a consequence of the influence of mobile telecommunications fields for several hours, Borbély et al. (1999) were able to demonstrate that changes in sleep were already occurring after 15 to 30 minutes exposure. This research team used also a 900 MHz field, which could be selectively pulse-modulated with either 2, 8, 217 or 1736 Hz. As in the other experiments, a statistically significant reduction in the proportion of REM sleep was found at a Specific Absorption Rate of less than 1W/kg. In addition, the waking-up phase was noticeably reduced.

Freude et al. (*1998, see also Henschel et al. 1999) examined the effect of the radiation from mobile telephones on slow brain potentials.

Slow brain potentials are event-correlated brain potentials that arise during the preparation for motor action and/or information processing. Changes in the slow brain

potentials give an indication about the influences on specific aspects of human information processing. Freude et al. found that the fields of a mobile telephone (916.2 MHz, 217 Hz, SAR 0.882-1.42 W/kg, exposure time 3 to 5 minutes) led to a statistically significant decrease of the slow readiness potentials for specific tasks, in specific brain areas.

5.2.4 Cognitive Functions

Impairments of the brain, e.g. by modification of the choline-uptake, can be expected to cause learning deficits. These were demonstrated in many learning experiments, in which rats were previously exposed to pulsed microwave fields (*Lai et al. 1989, 1994; *Wong & Lai 2000, see above D'Andrea 1999 for older studies). In the study by Lai et al. (*1994), rats were exposed for 45 minutes to a 500 Hz pulsed 2.45 GHz field with a power flux density of 10 W/m^2. This intensity resulted in a mean whole body SAR of 0.6 W/kg. Following the exposure, the starved rats were placed in a labyrinth with several arms in which food was placed. The researchers measured how effectively the 'exposed rats' and the 'sham-exposed rats' searched the labyrinth for food. For the 'exposed' group, significantly more failed attempts were observed, i.e. searching already emptied labyrinth arms. The authors attributed the low performance of the 'exposed' rats to deficits in spatial memory. The 'handicap' of the EMF exposure could be levelled out in a follow-up experiment, in which the rats were given either the acetylcholine agonist Physostigmin or the opiate antagonist Naltrexone before their exposure. According to the authors, these findings are confirmation of their results from previous studies (see above), in which they had found that high frequency electromagnetic fields influence cholinergic and endogenous opioid neurotransmitter systems in the brain and that this effect can lead to memory deficits. In the meantime, the effect has been confirmed by other experiments (Mickley & Cobb 1998).

In a further experiment (*Wang & Lai 2000), rats were trained over several sessions to find a platform situated just under the water surface inside a round water basin. Subsequently, they were exposed to pulsed microwave radiation for an hour (2.45 GHz, 500 pulses per second, mean power flux density 2W/m^2, mean whole-body SAR 1.2 W/kg). Testing was then carried out to determine how long the 'exposed rats' needed to find the platform from different starting positions, compared to the 'non-exposed rats' or 'sham-exposed rats'. The 'exposed rats' clearly required longer for this, as they spent significantly less time in the correct quadrant of the water basin. Finally, the recorded traces of the swimming lanes used by the 'exposed animals' differed from those of the control groups, this suggests that different strategies were used when searching for the platform. This result confirms the findings from other studies that pulsed high frequency fields can influence specific aspects of memory performance.

The effects of a 600 MHz field on the memory of rats were also demonstrated by Mickley et al. (*1994). In this experiment, the capacity of the animals to recognize familiar objects was measured in relation to the radiation they received. Whilst the 'non-exposed control animals and also the animals who were exposed to a SAR of 0.1 W/kg occupied themselves for longer with a novel object compared to a familiar object, the higher exposed animals spent just as much time examining an actually familiar object as with a

novel object. The limit for this exposure dependent change in behaviour was between 0.1 and 1.0 W/kg

The lowest SAR so far which has been shown to have an effect on cognitive functioning in rats was 0.072 W/kg. However, in this experiment, pulses with a peak of more than 700 MW (megawatts) were used (Raslear et al. 1993). The low SAR in this case resulted only from averaging over time with a very low pulse repetition rate of 0.125 pulses per second and a pulse width of only 80 nsec.

It has been shown in experiments by Preece et al. (*1999) that fields like those used in mobile telephony can influence cognitive functions of the brain. In this study, 36 subjects were subjected to a 915 MHz field of a simulated mobile telephone. The field was overlaid either with a 217 Hz sinusoidal modulation or a 217 Hz pulse modulation. In the analogue simulation the net forward power was about one Watt, and in the digital simulation it was 0.125 Watt. Under the conditions 'Exposure to analogue field', 'Exposure to digital field' or 'Sham exposure without any field', each of the test persons had to carry out several tests to measure ability to react and various tests of memory performance. In both exposed groups there was a slight but statistically significant decrease in reaction time, which was more marked for 'Analogue exposure' than for 'Digital exposure'.

5.3 Hormone Systems

5.3.1 Stress Hormones

Environmental pollution can act as a stressor on the body, like physical and mental stressors, and cause 'alarm reactions'. Such reactions are associated with hormonal changes. The presence of a stress-situation can be proved by the presence of hormones like adrenocorticotropin [the adrenocorticotrophic hormone] (ACTH), cortisol and corticosterone in the blood, and also to a lesser extent by changes in the concentration of prolactin and growth hormone.

Electromagnetic fields can clearly cause stress reactions in animals used for experiments. Thus, the experiment by Imaida et al. (*1998a) on rats that were exposed for a duration of 90 minutes daily over a period of 6 weeks to a field with a carrier frequency of 929.9MHz and a 50 Hz pulse modulation, showed a statistically significant increase in the ACTH and corticosterone levels. The whole-body SAR value in this experiment was between 0.58 and 0.8 W/kg. The exposure in the 1.439 GHz field, equally with a 50 Hz pulse modulation and a SAR value between 0.453 and 0.680 W/kg had the same effect (*Imaida et al. 1998b).

Chou et al.(*1992) exposed rats in a long-term experiment (25 months) to 800 MHz pulse-modulated 2.45 GHz field that led to a Specific Absorption Rate of 0.15 to 0.4 W/kg. Alongside other physiological parameters the corticosterone profile was regularly measured for the first half year of the experiment. Whilst the hormone profile of the exposed animals and the non-exposed animals were practically identical in the later stages of the experiment, with the exception of a slight increase in the sham-exposed group of animals in the third phase of the experiment, the first examination after 6 week's exposure showed a statistically significant increase in the corticosterone profile in the blood of the exposed animals.

The authors report that their attempt to replicate this effect produced no statistically significant results, however, only 20 animals were tested in this second experiment whilst the actual series of experiments contained 200 animals.

A similarly extensive experiment on rats like that of Chou et al. However, with an unmodulated 435 MHz field showed no difference in the concentration of the hormones ACTH, corticosterone and prolactin between the exposed animals and the non-exposed animals (Toler et al. 1988).

The few experiments previously carried out on humans do not yet produce a clear picture. Mann et al. (*1998) exposed 24 volunteer subjects whilst asleep to the field of a mobile telephone that was transmitted from a separate antenna (900 MHz, 217 Hz, 0.2 W/ m^2). Blood samples were withdrawn via a catheter whilst the subjects were asleep and they were analysed for, amongst other things, cortisol and growth hormone concentrations. There were systematic differences between the 'exposed subjects' and the 'sham-exposed subjects' during the course of the night for both hormones, which only reached statistical significance levels for cortisol.

De Seze et al. (*1998) examined the effect of a GSM mobile telephone (900MHz, 217 Hz) on subjects who were exposed to the field for 2 hours per day, 5 days per week for over a month. Based on nine blood sample withdrawals per week; amongst other things, the change in the concentrations of ACTH, growth hormone and prolactin were determined over time.

The authors' evaluation of their studies was that at one month, intermittent exposure in the radio-frequent field from the mobile telephone had no lasting or accumulative effects on the hormone secretions from the anterior lobe of the pituitary gland. In their data, it is however noticeable that that ACTH and prolactin follow a quite similar profile over time: the concentrations started at high initial values at the start of the exposure and then decreased in the following 3 weeks, and they then rose slightly again. The growth hormone concentrations are very high for the first measurements during the exposure period, they then fall to the pre-exposure concentration levels and maintain these levels until the end of the experiment. Possibly, these measurements show a temporary stress reaction, which reduced in the following weeks.

5.3.2 Melatonin

The hormone melatonin, which is produced in the pineal gland, functions as a regulating hormonal signal that synchronizes the endocrine rhythms of all the hormone glands. It regulates, amongst other things, the daily cycles of ACTH and the cortisol-release and thereby regulates the daily rhythms of many metabolic processes.

Melatonin also exerts influences (inhibitory) on sex hormones and it has a stimulatory effect on the immune system. Melatonin also influences specific cancer illnesses via the regulation of the release of the sex hormones. In addition, melatonin is a free radical scavenger, inactivating radicals such as OH, which amongst other things can be dangerous for the genetic material. Furthermore, during *in vivo* experiments, it was demonstrated that melatonin hinders changes in DNA produced by chemical carcinogens

and it protects lymphocytes from chromosome damage in high frequency electromagnetic fields (*Lai & Singh 1997).

In the previously described experiments carried out by Imaida et al.(*1998 a, b), it was found that the experimental animals that were exposed to a pulse-modulated high frequency field had a reduced melatonin concentrations in the blood. This finding could not be confirmed by Heikkinen et al. (1999), who exposed mice for 17 months to a 900 MHz field with a 217 Hz GSM pulse modulation (SAR: 0.35 to 1.5 W/kg). Studies by Vollrath et al. (1997) using rats and hamsters with a 900 MHz field (217 Hz GSM, SAR: 0.04 to 0.36 W/kg) could not contribute much to the clarification of the problem, since in several sub-sets of the experiment statistically significant differences between 'exposed animals' and 'non-exposed animals' had been found, but according to the authors these resulted from mistakes in the experimental order.

In experiments by Mann et al. (*1997 see above), the stress hormones were measured as well as the serum melatonin profile. This showed, in the case of the exposed humans, that for a period of between 3 to 4 hours in the middle of the night there was an increase compared to the control values, but these were not statistically significant according to the evaluation of the authors.

6 Pathological Effects

6.1 Results of Experimental Studies

6.1.1 Cancer

Carcinogenesis

Carcinogenesis is a multi-layered process, at the beginning of which is a certain impact on the level of the genetic material. This can be a direct impact (for example ionising radiation) or an indirect action via the product of a reaction (for example OH radicals). A direct or indirect interaction with DNA can lead to damage of the DNA or the chromatin structures (see also Chapter 3). If those damages are not repaired by endogenous processes, the damage will be permanent. Thus, the initiated cell can, if the immunological control fails, under the influence of hormones and promoters develop into a pre-neoplastic focus, which can then lead to a malignant tumor. The different steps of carcinogenesis are summarised in three phases:

- Initiation: Triggering of damage on the DNA and mutations on critical genes
- Promotion: Increased rate of DNA synthesis and proliferation of transformed cells
- Progression: Transition of a pre-neoplastic focus to a malignant tumor

A physical or chemical pollutant can in principle be effective in all three phases of carcinogenesis.

- Initiation: Triggering of direct DNA damage or of a substance which causes DNA damage, disruption of repair processes of the DNA
- Promotion: Promotion of the proliferation of transformed cells
- Progression: Suppression of immune-reactions and promotion of tumor growth

Results from Animal Experiments

In vivo experiments using animals with an inbred genetic predisposition for certain tumor illnesses or in which animals were injected with cancer cells, yielded very different results (see Appendix C, Table C.1). In the majority of the studies, no cancer promoting effect of high frequency electromagnetic fields could be found, or effects were only observed under certain conditions of exposure (marked in the Table with 'partly'), and even in those cases they were often not statistically significant. However, it needs to be noted that many studies with negative results had very short exposure times and durations of the study itself (for example Chagnaud et al. 1999: 2 weeks, Salford et al. 1993: 2 to 3 weeks) and hence they do not have much relevance to answer the question whether high frequency electromagnetic fields have carcinogenic potential.

Some long-term studies have yielded results which indicate a carcinogenic or co-carcinogenic effect of electromagnetic fields with mobile telecommunications frequencies

if the animals are exposed over a long period of time. (*Repacholi et al. 1997, *Szmigielski et al. 1982 and *Szudinski et al. 1983). Important in this context is also the study of Chou et al. (*1992). This study did not find a statistically significant rise in tumors in a particular organ. However, the exposed group developed not only a higher number of tumors in total, but also the number of primary malignant and metastatic malignant neoplasms was significantly higher in the exposed animals. In their discussion of the results, the authors point to the fact that the number of the primary malignant neoplasms in the exposed group compared to the control group is four times higher and that this finding is statistically significant, but then go on to undermine their finding by quoting literature, according to which the tumor incidence of the exposed group should still be within the normal range.

The experiment of Toler et al. (*1997) using animals with a predisposition for chest tumors did not result in a higher incidence of these, but the number of ovarian tumors was significantly higher in the exposed group compared to the controls.

The intensities at which an increase in tumors was found in animals were one to two powers of ten below the values at which one would expect a triggering of 'thermal' effects. According to the presenting results, low frequency modulation does not seem to be responsible for the carcinogenic effect.

6.1.2 Infertility and Teratogenic Effects

Teratogenesis

Teratogenic effects of a pollutant can – as with the carcinogenic effect – either be caused by the triggering of a genetic defect or a harmful impact on the foetal development. The formation of a genetic malformation during its initiation phase is analogous to carcinogenesis, i.e. teratogenic effects are also caused by direct or indirect impact on the DNA and disruptions of the endogenous repair mechanisms. Later damages of the foetus can either be caused by direct effects of the pollutant on the foetus or by reactions to the pollutant within the mother's organism, which would then be passed on to the foetus.

Results from Animal Experiments

A multitude of studies have demonstrated that high body temperatures in mammals lead to a spermatotoxic and teratogenic effect. Since many studies examining such effects from high frequency electromagnetic fields worked with intensities that were capable of significantly raising body temperature, it cannot be excluded that the observed spermatotoxic and teratogenic effects were caused by a thermal effect, (see for example Berman et al. 1982, 1983, Berman & Carter 1984, Jensh et al. 1983a,b, Kowalczuk et al. 1983, Lary et al. 1983, Nawrat et al. 1985, Saunders et al. 1981, 1983, for the results of older studies, see O'Connor 1980). The results of these studies do not always appear consistent, however, this can possibly be explained by a different thermal susceptibility of the different animal species used. In rats for example, a loss of thermally damaged embryos is often observed, whilst the birth of malformed animals is rare. Other mammals show a wider bandwidth between teratogenic and lethal exposures. (Verschaeve & Maes 1998).

However, there are some indications in the literature for teratogenic effects at intensities that cause no (or, if at all very small) rises in temperature. Magras & Xenos (1997) exposed mice during six months to a real transmitter. The mice had offspring five times during this period and a continuous decrease in offspring was found down to irreversible infertility. The exposure consisted of several radio and TV transmitters in the VHF and UHF bands and measured between 0.00168 and 0.01053 W/m^2. A repetition of this study would be desirable in order to exclude that the effect was due to problems with the maintenance of the animals or the screening of the control group.

Khillare and Behari (*1998) found that male rats that had been exposed to a 200 MHz field (power flux density:14.7W/m^2, SAR:1.65 to 2.0W/kg) during a period of 35 days for six days per week and two hours per exposure day and which were afterwards mated with unexposed females, produced significantly less offspring that the males in the unexposed control group.

In an experiment by Akdag et al. (1999) male rats were exposed one hour every day to a 9.45 GHz field (power flux density:2.5W/m^2, SAR:1.8 W/kg) during different periods of 13, 26, 39 or 52 days corresponding to one, two, three and four cycles of the seminal epithelium.

At the end of each exposure period the following data were measured and compared to an unexposed control group: number of sperm in the epididymides, morphology of the sperm and weight of the testicles, epididymides, seminal vesicles and prostate.

They found amongst other effects a decrease in the number of sperm (statistically significant in the group exposed for 53 days) and an increase of abnormal sperm (statistically significant in the groups exposed for 26, 39 and 52 days).

A co-teratogenic effect under non-thermal exposures with power flux densities of 10 to 100 W/m^2 in combination with cytosine arabinoside (CA) was found in a study by Marcickiewicz et al. (*1986). In the experiment, mice were exposed in utero for two hours a day to 2.45 GHz from the first to the 18th day of the pregnancy. The field, which alone was not teratogenic, significantly increased the teratogenic effect of CA. A direct teratogenic effect of microwave radiation with a frequency of 2.45 GHz on the brains of newborn rats was found by Inalösz et al. (*1997). However the authors declared that the SAR of 2.3W/kg led to a rise of rectal temperature of 1.0ºC.

6.2 Results of Epidemiological Studies

Methodological Requirements

In principle, epidemiological studies are an effective instrument to prove potential health risks of a pollutant under real environmental and exposure conditions. Usually, they are carried out by comparing statistical data about the incidence of an illness in an exposed population as opposed to the incidence of this illness in an unexposed population. The exact classification of exposure would require the metrological recording of the pollutant for all participants (exposed and unexposed) during the entire latency period of the illness. This is often not practicable and for long latency periods, which can usually only be addressed via retrospective studies, inherently impossible. Under such circumstances it

has to suffice that surrogates are used, for example having a profession which is linked to a certain exposure or the proximity of the home to an emitting installation. In some cases, if the emitting installations have been used for a long time in the same mode, it is possible to extrapolate past exposures from current measurements.

The quality of the exposure classification determines the validity of an epidemiological study. Possible weaknesses, which can lead to wrong results, are:

- People are classified as 'exposed' or 'strongly exposed' although in fact there is no or only little exposure. An example with regards to high frequency fields is the often-used exposure classification on the basis of professional categories, such as radar operators or telecommunications engineers, for whom it cannot be excluded that the main occupation is a desk job without exposure.

- It is assumed that the control group is completely unexposed, although the pollutant is actually ubiquitous, which will lead to smaller but still potentially significant exposures in the control group. One known example are mains frequency magnetic fields, which affect the immediate neighbours of power supply equipment, but still exist at non-negligible strengths in houses which are further away from such equipment.

Both effects lead to a levelling out between the exposed and unexposed group and hence to an underestimation of the real health risk posed by the pollutant in question.

Another weakness of epidemiological studies can be the presence of unrecognized confounders, i.e. other influences, which also affect the groups studied and influence the development of the illness. This can be environmental factors, such as exposures to other pollutants, but also socio-economic and behavioural factors. If not all potentially relevant confounders are factored in, the results can be distorted, either towards an overestimation or an underestimation of the real risk.

The fast development of mobile technology has lead to a double dilemma with regards to the study of potential risks through epidemiological studies:

- For illnesses like cancer with latency periods of many years it is still too early to expect valid results. If mobile telecommunications are indeed linked to a higher incidence of cancer, the illness will only have manifested in a few people so far. This should at least be valid for the part of the population whose exposures are from base stations only. Potentially it could be different for direct mobile phone users, since these are generally exposed to significantly higher intensities. But also for this group, at this moment in time, we would expect results from epidemiological studies to underestimate the real risk.

- In some years epidemiological studies will hit a different obstacle: once base stations cover the entire country and a large proportion of the population use a mobile phone, it will become difficult to find the necessary unexposed control groups.

Given this dilemma, epidemiological studies carried out in the past have a certain validity, even if the exposures are not exactly the same as they would be today and the studies do not always correspond to today's quality standards.

The Selection of Studies

At the time of finishing this present report there were only two epidemiological studies of health risks in relation to actual existing mobile telecommunications exposures (*Rothman at al. 1996, *Hardell et al. 1999). However there are a much larger number of studies available, in which the health effects of high frequency electromagnetic fields in humans were examined (see also Appendix D, Table D.1). Just under a quarter of all results relate to exposures with low frequency pulse or amplitude modulated high frequency fields, such as they are used for mobile telecommunications, even if the carrier and modulation frequencies are in most cases not identical with those of mobile telecommunications.

In Appendix Table D.1, the examined illnesses are listed with their evaluated end point (incidence or mortality), data describing the exposure situation is given and the quality of the exposure classification is assessed. Finally, the result of the study is evaluated as 'Relative Risk' (RR) which includes the relevant risk factors in the form of standardised mortality rates, standardised morbidity rates and odds ratios, and the statistical significance is assessed. For each study we list the value for the highest exposure class or if there was a further differentiation of the examined groups, for example according to occupational groups, the highest found value.

Values are considered statistically significant (s.s.) if the value RR=1 outside of the 95% confidence interval or if $p<0.05$.

A statistical evaluation of the results presented in Table D.1 can be found in Table 6.1. Here, we list for every illness how many studies or separate results are available, how many of these show a relative risk RR >1 and how many are statistically significant.

Almost all the studies, in which the total cancer risk without any differentiation according to tumor form were examined, showed a risk factor of RR>1. Half of the studies resulted in statistically significant risk factors with a maximum value of 2.1, which corresponds to a doubling of the statistical risk to develop cancer from exposure to high frequency electromagnetic fields.

A similar picture was found in relation to tumors of the nervous system, especially brain tumors. Here, the maximum value for relative risk found was 3.4. Eleven of the total of 15 studies yielded a positive result, more than half of which were statistically significant.

The incidence of breast cancer in relation to high frequency fields must be examined separately for men and women. All three studies relating to the breast cancer incidence in women yielded risk factors greater than 1, the statistically significant values were 1.15 and 1.5. For men, risk factors of up to 2.9 were found; however, not all were statistically significant.

Of the total of 16 results for leukaemia without further differentiation of the illness, 13 were positive (RR>1), more than half of these results were statistically significant. The highest statistically significant value for the relative risk was 2.85. Amongst the results of the differentiated studies, the following are notable: lymphatic leukaemia (7 results, 5 positive, 4 statistically significant, RR maximum value: 2.74) and acute myeloic leukaemia (4 different studies, 3 positive results, 2 statistically significant, maximum RR value: 2.89).

With regards to the correlation of high frequency electromagnetic fields from radar and other sources and testicular cancer, three studies have been conducted. All lead to statistically significant risk factors with a maximum value of 6.9.

The studies regarding cardio-vascular diseases did not result in a clear picture, not least because of the multitude of the symptoms examined.

All four studies of fertility problems in relation to the exposure of men to microwaves indicate increased risk. In two studies statistically significant risk factors of up to 2.7 were found.

With regards to irregular courses of pregnancies and malformations in children of mothers which had been exposed to high frequency fields, there are a large number of studies with positive results, of which only two fit into the frequency range relevant to our report. Both of these studies found statistically significant positive results with risk factors of up to 2.36.

Of the studies of cancer risk of children whose fathers had been exposed to electro-magnetic fields, only two correspond to the quality criteria required for inclusion into this report. Both indicate an increased risk, but only one result is statistically significant at a value of RR=2.3. (With regards to the cancer risk of children in correlation to the exposure of their parents, see also Colt & Blair 1998).

Regarding the disruption of motor functions as well as psychological functions and well-being, there is only one valid study for the frequency bands relevant to this report, which yielded a slightly increased risk factor. However since other studies of transmitters with frequencies below 100 MHz resulted in serious indications of increased risk, indicating that this problem should be given more attention in the future, we also included the study of Zhao et al. (1994), although it didn't meet our quality standards with regards to the statistical evaluation.

Unfortunately, the majority of the studies do not state the actual strength of the exposures. Measurements are only available for the radio and television transmitter used for the studies of Hocking et al. (1996) and McKenzie et al. (1998). The mean power flux densities for all 16 municipalities affected by this transmitter were $3.3\ 10^{-3} W/m^2$ within the range from $2.6\ 10^{-4}$ to $1.46\ 10^{-2} W/m^2$ (McKenzie et al. 1998). The ICNIRP guidelines for the general population recommend a maximum value of 2 to 2.51 W/m^2 for the range of frequencies emitted by this transmitter (64.25 to 527.25MHz). This means that the exposures in these studies were below the German guidelines by a factor of 10^{-4}.

Table 6.1
Overview over the results of epidemiological studies with regards to the health risks of high frequency electromagnetic exposures (see also Appendix D, Table D.1)

Illness	Number of studies (results)	Studies (results) with RR>1	Statistically significant results
All illnesses	2	0	0
Cancer, unspecified	6 (7)	5 (6)	3
Brain tumours unspecified and tumours of the nervous system unspecified	14 (21)	10 (15)	6 (7)
Cancer (eyes)	1	1	1
Cancer of the respiratory organs, lung cancer	5	2	1
Chest cancer, men	2	2	0
Breast Cancer, women	3	3	2
Cancer of the lymphatic and blood forming system unspecified	4	4	1
Leukaemia unspecified	12 (16)	9 (13)	5 (7)
Acute leukaemia unspecified	4	4	0
Lymphatic leukaemia unspecified	4 (7)	2 (5)	1 (4)
Acute lymphatic leukaemia	2	2	0
Chronic lymphatic leukaemia	4	4	1
Leukaemia, non lymph. non-myelo	1 (4)	1 (4)	1 (2)
Lymphoma, Hodgkin-Syndrome	5 (7)	3 (4)	1
Testicular cancer	3 (5)	3 (5)	3 (4)
Uterine cancer	1	1	1
Skin cancer	4	3	1
Cardio-vascular diseases	4 (5)	3 (4)	1
Infertility, reduced fertility, men	4 (7)	4 (7)	2 (4)
Infertility, reduced fertility, women	1	1	0
Miscarriages, stillbirths, malformations and other birth defects	2 (3)	2 (3)	2
Cancer, offspring (parental exposure)	2	2	1
Neurodegenerative diseases, Alzheimer's	1	1	0
Disruptions of motor and psychological functions and well-being	2 (9)	2 (9)	1 (7)

7 Health Risks to Humans Resulting from Exposure to the Electromagnetic Fields of Mobile Telecommunications

The triggering of an illness caused by an (environmental) pollutant and the development of this illness are a multi-phased process, which begins with a biological, biochemical or biophysical primary interaction of the pollutant with the biological system and ends with the manifestation of the illness. During the different phases of the process, the body's own repair mechanisms can intervene and impede the further development of the illness. An assessment of the potential health risks of electromagnetic fields as they are used for mobile telecommunications should therefore be mainly based on studies conducted directly on humans, because extrapolations from animal studies or even *in vitro* studies on cell cultures only have limited validity for effects in humans, due to the difference in susceptibilities and the lack of organic interactions in cell cultures. However, due to the ethical limits to the research on humans, it is unavoidable to use results from experiments with animals, single organs or cells in order to discover the biological and physiological mechanisms.

Cancer

Given the results of the present epidemiological studies, it can be concluded that electromagnetic fields with frequencies in the mobile telecommunications range do play a role in the development of cancer. This is particularly notable for tumours of the central nervous system, for which there is only the one epidemiological study so far, examining the actual use of mobile phones. The most striking result of this study was an obvious correlation between the side at which the phone was used and the side at which the tumour occurred. The brain tumour incidence however was only slightly increased. A (hypothetical) explanation of such a finding could for example be that mobile fields have a promoting effect on previously initiated (multiple) tumours, triggering a defence mechanism in the body which is capable of suppressing unpromoted tumours.

Higher risks were also demonstrated for several forms of leukaemia.

Although the studies in relation to testicular cancer were examining particular exposure conditions (emitting equipment worn partly on the body at hip level), given the high risk factor found, a possible risk cannot be excluded, especially not for mobile users wearing the devices in standby mode on their belts. The epidemiological findings for testicular cancer also need to be interpreted in conjunction with the results of the studies of fertility problems occurring in relation to high frequency electromagnetic fields.

The risk factors for cancers other than testicular cancer are only moderately increased, but not negligible, considering this technology will potentially reach full coverage of the entire population.

Reliable conclusions about a possible dose-response-relationship cannot be made on the basis of the present results of epidemiological studies, but an increase of cancer risk cannot be excluded even at power flux densities as low as 0.1 W/m².

In long-term animal experiments, the carcinogenic effect of pulse modulated high frequency fields was demonstrated for power flux densities of circa 3W/m² (mouse, exposure duration 18 months, 30 minutes per day, SAR (mouse) circa 0.01 W/kg).

On the cellular level, a multitude of studies found the type of damage from high frequency electromagnetic fields which is important for cancer initiation and cancer promotion:

Direct damage on DNA as well as influences on DNA synthesis and DNA repair mechanisms were demonstrated in *in vivo* and *in vitro* experiments for continuous and pulsed fields at power flux densities from 10W/m² and 9W/m² respectively.

Chromosome aberrations and micronuclei occurred at power flux densities from 5 W/m².

Neoplastic cell transformation and an enhanced cell proliferation were demonstrated for Specific Absorption Rates of below 0.5W/kg, and individual studies demonstrated that the obvious disturbance of the communication between cells, which is a prerequisite for the uninhibited proliferation of cells that is characteristic for cancer development, occurs at just a few W/m².

Conclusion:

The results of the studies for all stages of cancer development from the damage of the genetic material via the uninhibited proliferation of cells and debilitation of the immune system (see below) up to the manifestation of the illness prove effects at power flux densities of less than 1 W/m². For some stages of cancer development, intensities of 0.1 W/m² or even less may suffice to trigger effects.

Debilitation of the Immune System

Damaging effects on the immune system which can aid the development of illnesses were demonstrated in animal experiments at power flux densities of 1 W/m² (mouse, exposure duration 6 days, 3 hours per day, SAR (mouse) 0.14W/kg). In *in vitro* experiments on lymphocytes, defects of the genetic material were demonstrated at power flux densities of circa 10 W/m². The presence of stress hormones, which when permanent can debilitate the immune system, was found to be increased in human experiments from power flux densities of 0.2W/m². In animal experiments (rat) a similar effect was observed at a Specific Absorption Rate of circa 0.2 W/kg.

Conclusion:

Experiments on animals prove harmful effects on the immune system from circa 1 W/m²; at power flux densities of 0.2 W/m² higher secretions of stress hormones in humans have been demonstrated.

Influences on the Central Nervous System and Cognitive Function

The effects of pulsed and continuous high frequency fields on the blood-brain-barrier and the activity of neurotransmitters were demonstrated in animal experiments for power flux densities of 3 and 10 W/m^2 respectively.

In humans, influences on the slow brain potentials were found at SAR values of 0.882 to 1.42W/kg, i.e. well below the current guidelines for partial body exposure of 2 W/kg.

Changes in the sleep EEG of humans, which showed a shortening of the REM sleep phase occurred at intensities as low as 0.5 W/m^2.

In animal experiments, changes in the EEG were demonstrated at power flux densities of 1 to 2W/m^2.

Impairment of cognitive functions was found in animal experiments at power flux densities of 2W/m^2. In humans, there are indications that brain functions are influenced by fields such as they occur when using a mobile telephone.

An epidemiological study of children who had been exposed to pulsed high frequency fields, found a decrease in the capability to concentrate and an increase in reaction times.

Conclusion:

Effects of high frequency electromagnetic fields on the central nervous system are proven for intensities well below the current guidelines. Measurable physiological changes have been demonstrated for intensities from 0.5 W/m^2. Impairments of cognitive functions are proven for animals from 2W/m^2.

Electrosensitivity or Electromagnetic Hypersensitivity

The terms 'electrosensitivity' or 'electromagnetic hypersensitivity' describe disturbances of well-being and impairments of health, such as they are suffered by certain sensitive people when working with or being in the presence of devices and equipment emitting electrical, magnetic or electromagnetic fields. The sensitivity manifests in a variety of symptoms including:

- nervous symptoms such as sleep disturbances, headaches, exhaustion, lack of concentration, irritability, anxiety, stress
- cardio-vascular complaints
- disruptions of hormones and metabolism
- skin complaints

The composition and strength of the complaints varies enormously in different individuals. The correlation of the complaints with electromagnetic exposures and other environmental influences seems to vary strongly not only between affected persons but also in time, a fact that has so far impeded the conclusive scientific proof of a cause-effect-relationship in provocation studies. The present results of scientific studies are often not conclusive and partly contradictory. On the other hand, however, there is a wealth of data

collected by the self-help organisations of affected people, which has not yet been explored.

Conclusion:

On the basis of current knowledge it is impossible to estimate the risk of electrosensitive reactions or to make recommendations for guidelines designed to avoid such a risk for the general population, which is composed of sensitive and non-sensitive persons.

8 Recommendations

8.1 Precautionary Health Protection in Relation to Exposures to Electromagnetic Fields of Mobile Telecommunications

With mobile telecommunications we have to differentiate to exposure situations:

- exposure of residents near base stations
- exposure of mobile users when using the devices

To limit exposure to an acceptable degree, if this is possible at all, there need to be different strategies for the two different exposure groups.

Exposures from Base Stations

In humans, harmful organic effects of high frequency electromagnetic fields as used by mobile telecommunications have been demonstrated for power flux densities from 0.2W/m² (see Chapter 7). Already at values of 0.1 W/m² such effects cannot be excluded. If a security factor of 10 is applied to this value, as it is applied by ICNIRP and appears appropriate given the current knowledge, the precautionary limit should be 0.01W/m². This should be rigorously adhered to by all base stations near sensitive places such as residential areas, schools, nurseries, playgrounds, hospitals and all other places at which humans are present for longer than 4 hours.

We recommend the precautionary limit of 0.01 W/m² independent of the carrier frequency. The rough dependency on frequency with higher limits outside of the resonance range, as it is applied in the concept of SAR, is not justifiable given the results of the scientific studies which conclusively prove non-thermal effects of high frequency fields. Also, the current allowed higher exposures for parts of the body, as long as they refer to the head or thorax are not justifiable.

Exposures of Mobile Phone Users

Given the state of technology now and in the foreseeable future, it is currently technically impossible to apply the recommended maximum value for mobile base stations also to the use of mobile phones. However, a lowering of the guidelines to a maximum of 0.5 W/m² should urgently be considered.

A particular problem in this exposure group is posed by children and adolescents, not only because their organism is still developing and therefore particularly susceptible, but also because many adolescents have come to be the most regular users of mobile phones.

Advertising towards this population group should be banned. Furthermore, particular efforts should be made to lower the exposures during calls. It would be recommendable to conduct (covert) advertising campaigns propagating the use of headsets. It would also be important to develop communications and advertising aiming at minimising the exposures created by carrying mobile phones in standby mode on the body.

8.2 Scientific Studies Regarding the Health Risk of Mobile Telecommunications

The precautionary limits recommended in Chapter 8.1 are based on the current scientific knowledge. This is, however, still incomplete and in the case of this technology, which is exposing the entire population to its emissions, further research efforts are needed to create a base for the setting of truly reliable guidelines. Based on the scientific knowledge presented in this report, the further research requirements are mainly for studies on living organisms (humans or animals):

Epidemiological studies

- studies that metrologically record the exposure on existing radio transmitters (USW), TV transmitters and longer-established radio communications and paging networks. (The emissions of this type of equipment with regards to the modulation frequencies may not be directly comparable to those of mobile telecommunications, but such studies could nevertheless offer important indications for the assessment of the exposure risks of high frequency electromagnetic fields; the studies should focus on cancer and illnesses of the central nervous system including neurodegenerative diseases as well as cardio-vascular diseases and any diseases caused by a disruption of the immune system; such studies should also address potential clusters of unspecified symptoms and impairments of well-being (electrosensitivity)).
- a meta-study with retrospective dosimetry for the studies which examined the residents near emitting base stations (see Appendix D) with the help of measured data from comparable sites
- a cohort study examining the health (see above) of mobile users and residents near mobile base stations
- epidemiological animal studies on pets

Experimental long-term studies

Studies of the chronic effects of the fields emitted by mobile telecommunications

- on the central nervous system (preferably on humans)
- on the immune and endocrine system (preferably on humans, but further animal experiments at low intensities would also be helpful for example with regards to EMF-induced stress)
- on the cardio-vascular system (variability of heartbeat rates, blood pressure, etc., on humans and on animals)

Experimental short-term studies

Studies of the acute effects of the fields emitted by mobile telecommunications

- on the brain in various rest and stress situations (preferably making use of EEG and similar methods)

Beyond these suggestions, it would be important to develop a strategy for the research of the 'electrosensitivity' phenomenon and its incidence, which would acknowledge the failure of traditional scientific methods to address the problem and allow the inclusion of the data available from the self-help groups and associations of the affected.

Literature

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Yang H.K., Cain C.A., Lockwood J. § Tompkins W.A.F.	1983	Effects of microwave exposure on the hamster immune system. I. Natural killer cell activity	Bioelectromagnetics	4	123-139
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Appendix A

Studies of the effects of high frequency electromagnetic fields on the cellular level

Abbreviations

neg.	negative finding
n.s.	not statistically significant
pos.	positive finding
s.s.	statistically significant
partly	some findings
#	disagreement with the conclusions of the authors
?	unknown; not provided; unreliable

Table A.1 Genotoxic effects of high frequency electromagnetic fields

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
Direct DNA damage						
2,45 GHz	cw	10 – 20 W/m^2 0,6 – 1,2 W/kg	2 h	Rat, in vivo	pos., s.s.	Lai & Singh 1995
2,45 GHz	PM, 500 Hz	10 – 20 W/m^2 0,6 – 1,2 W/kg	2 h	Rat, in vivo	pos., s.s.	Lai & Singh 1995
2,45 GHz	PM, cw	20 W/m^2 1,2 W/kg	2 h	Rat, in vivo	pos., s.s.	Lai & Singh 1996
2,45 GHz	PM, 500 Hz	20 W/m^2 1,2 W/kg	2 h	Rat, in vivo	pos., s.s.	Lai & Singh 1996
2,45 GHz	PM, 500 Hz	20 W/m^2 1,2 W/kg	2 h	Rat, in vivo	pos., s.s.	Lai & Singh 1997
2,45 GHz	cw	0,7 – 1,9 W/kg	2 h – 24 h	Glioblastoma Cells (Human), in vitro	neg.?	Malyapa et al. 1997a
2,45 GHz	cw	0,7 – 1,9 W/kg	2 h – 24 h	Fibroblasts (Mouse), in vitro	neg.?	Malyapa et al. 1997a
836 – 848 MHz	cw, FM, PM	0,6 W/kg	2 h – 24 h	Glioblastoma Cells (Human), in vitro	neg.?	Malyapa et al. 1997b
836 – 848 MHz		0,6 W/kg	2 h – 24 h	Fibroblasts (Mouse), in vitro	neg.?	Malyapa et al. 1997b
2,45 GHz	cw	1,2 W/kg	2 h	Rat (Brain), in vivo	?	Malyapa et al. 1998
814 – 837 MHz	PM, TDMA, 50 Hz	8 – 90 W/m^2 2,4 – 26 W/kg	1 h – 10,67 h	T-Lymphoblasten	pos., s.s.	Phillips et al. 1998
2,45 GHz	cw	10 W/m^2 1,18 W/kg	120 d, 2 h/d – 200 d, 2 h/d	Mouse (Brain, Testicles), in vivo	pos., s.s.	Sarkar et al. 1994
1,7 GHz	cw	500 W/m^2	30 min	Mouse (Testicles), in vivo	pos.	Varma & Traboulay 1977

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
Influences on DNA synthesis and repair						
350 MHz	cw	10 – 100 W/m^2 0,039 – 4,5 W/kg	1 h – 3 h	Fibroblasts (Human), in vitro	unclear, partly pos.	Meltz et al. 1987
350 MHz	PM, 5,0 Hz	10 – 100 W/m^2 0,039 – 4,5 W/kg	1 h – 3 h	Fibroblasts (Human), in vitro	unclear, partly pos.	Meltz et al. 1987
850 MHz	cw	10 – 100 W/m^2	1 h – 3 h	Fibroblasts (Human), in vitro	unclear, partly pos.	Meltz et al. 1987
850 MHz	PM, 5,0 Hz	10 – 100 W/m^2	1 h – 3 h	Fibroblasts (Human), in vitro	unclear, partly pos.	Meltz et al. 1987
1,2 GHz	cw	10 – 100 W/m^2	1 h – 3 h	Fibroblasts (Human), in vitro	unclear, partly pos.	Meltz et al. 1987
1,2 GHz	PM, 80 kHz	10 – 100 W/m^2	1 h – 3 h	Fibroblasts (Human), in vitro	unclear, partly pos.	Meltz et al. 1987
836,55 MHz	PM, TDMA, 50 Hz	0,9 – 90 W/m^2 0,00015 - 0,059 W/kg	4 h – 14 d	Glioma-Cells (Rat), in vitro	pos., s.s.	Stagg et al. 1997
Chromosome aberrations						
2,45 GHz	cw	?	?	Mouse (bone marrow), in vivo	pos.	Banerjee et al. 1983
2,45 GHz	cw	400 W/m^2	6 d, 30 min/d	Rat, in vivo	pos.	Beechey et al. 1986
7,7 GHz	cw	300 W/m^2	15 - 60 min	Fibroblasts (Chin. Hamster), in vitro	pos., s.s.	Garaj-Vrohac et al. 1990
7,7 GHz	cw	5 W/m^2	15 - 60 min	Fibroblasts (Chin. Hamster), in vitro	pos., s.s.	Garaj-Vrohac et al. 1991
7,7 GHz	cw	5 – 300 W/m^2	10 min	Lymphocytes (Human), in vitro	pos., s.s.	Garaj-Vrohac et al. 1992
0,4 MHz – 20 GHz	cw, AM, PM			Human, in vivo	pos.#, n.s.	Garson et al. 1991
2,45 GHz	PM, 25 kHz	490 W/m^2 33,8 W/kg	2 h	Egg Cells (Chinese Hamster)	pos., partly s.s.	Kerbacher et al. 1990

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
2,45 GHz	cw	104 – 193 W/kg	20 min	Lymphocytes (Human), in vitro	neg.	Lloyd et al. 1984
2,45 GHz	cw	4 – 200 W/kg	20 min	Lymphocytes (Human)	neg.	Lloyd et al. 1986
2,45 GHz	cw	75 W/kg	30 – 120 min	Lymphocytes (Human), in vitro	pos.	Maes et al. 1993
954 MH	PM, 217 Hz, GSM	Occupational exposure		Lymphocytes, Human, in vivo	pos., s.s.	Maes et al. 1995
954 MHz	217 Hz, GSM	15 W/m^2 1,5 W/kg	2 h	Lymphocytes (Human), in vitro	pos., s.s.	Maes et al. 1995
935,2 MHz	PM/GSM, 217 Hz	0,3 – 0,4 W/kg	2 h	Lymphocytes (Human), in vitro	pos., n.s.	Maes et al. 1997
9,4 GHz	PM, 1000 Hz	1 – 100 W/m^2	2 w, 3 d/w, 1 h/d	Mouse, in vivo	pos., s.s.	Manikowska et al. 1979
2,45 GHz	cw	0,05 – 20 W/kg	2 w, 6 d/w, 30 min/d	Mouse, in vivo	pos., s.s.	Manikowska-Czerska et al. 1985
2,55 GHz	cw	2W/kg	20 min	DNA (E.coli), in vitro	pos.	Sagripanti & Swicord 1986
2,0 – 8,75 GHz	cw	10 W/kg	5 min – 25 min	DNA, in vitro	pos., s.s.	Sagripanti et al. 1987
2,45 GHz	cw	100 W/m^2	120 d 6 h/d	Spermatogonia (Mouse), in vivo	neg.	Saunders et al. 1988
2,45 GHz	cw	50 W/m^2 12,46 W/kg	90 min	Lymphocytes (Human), in vitro	pos., n.s.	Vijayalaxmi et al. 1997
2,45 GHz	cw	750 W/m^2	5 – 30 min	Chinese Hamster (Corneal Epithelium), in vivo	pos, s.s.	Yao 1978
2,45 GHz	cw	15,2 W/kg		RH5- and RH16-Cells (Kangaroo-Rat), in vitro	pos., s.s.	Yao 1982

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
Micronuclei						
154 – 162 MHz	PM, 24,4 Hz	Changing exposures on the pastures		Cow (Erythrocytes) in vivo	pos., s.s.	Balode 1996
2,45 GHz	CW	530 W/m^2 90 W/kg	10 min	Lymphocytes (Human), in vitro	pos., partly s.s.	d'Ambrosio et al. 1995
2,45	AM, 50 Hz, sin	530 W/m^2 90 W/kg	10 min	Lymphocytes (Human), in vitro	pos., partly s.s.	d'Ambrosio et al. 1995
1,25 – 1,35 GHz	?PM	0,1 – 200 W/m^2	Occupational exposure	Lymphocytes (Human), in vivo	pos.	Fucic et al. 1992
7,7 GHz	cw	5 W/m^2	15 - 60 min	Fibroblasts (Chin. Hamster), in vitro	pos., s.s.	Garaj-Vrohac et al. 1991
7,7 GHz	cw	5 – 300 W/m^2	10 min	Lymphocytes (Human), in vitro	pos., s.s.	Garaj-Vrohac et al. 1992
2,45 GHz	cw	75 W/kg	30 – 120 min	Lymphocytes (Human), in vitro	pos.	Maes et al. 1993
9,0 GHz	cw	70 W/kg	10 min	Lymphocytes (bovine), in vitro	pos., s.s.	Scarfi et al. 1996
2,45	cw	50 W/m^2 12,46 W/kg	90 min	Lymphocytes (Human), in vitro	pos.#, n.s.	Vijayalaxmi et al. 1997 b
2,45	cw	1,0 W/kg	18 mon	Erythroczyten (Mouse blood / bone marrow)	pos, s.s.	Vijayalaxmi et al. 1997 a
Sister chromatid exchange						
380 MHz	PM, 17,65 Hz	80 W/kg	?	Lymphocytes (Human), in vitro	neg.	Antonopoulos et al. 1997
900 MHz	PM/DCS, 217 Hz	208 W/kg	?	Lymphocytes (Human), in vitro	neg.	Antonopoulos et al. 1997
1,8 GHz	PM/GSM, 217 Hz	1700 W/kg	?	Lymphocytes (Human), in vitro	neg.	Antonopoulos et al. 1997
2,45 GHz	cw	?	?	Mouse (bone marrow), in vivo	neg.	Banerjee et al. 1983

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
2,45 GHz	PM, 25 kHz	490 W/m^2 33,8 W/kg	2 h	Egg Cells (Chinese Hamster), in vitro	neg.	Ciaravino et al. 1987
2,45 GHz	PM, 25 kHz	490 W/m^2 33,8 W/kg	2 h	Egg Cells (Chinese Hamster), in vitro	neg.	Ciaravino et al. 1991
2,45 GHz	cw	104 – 193 W/kg	20 min	Lymphocytes (Human), in vitro, Add. caffeine	pos., s.s.#	Lloyd et al. 1984
2,45 GHz	cw	75 W/kg	30 – 120 min	Lymphocytes (Human), in vitro	neg.	Maes et al. 1993
954 MHz	PM/GSM, 217 Hz	1,5 W/kg	2 h	Lymphocytes (Human), in vitro	pos., s.s.	Maes et al. 1996
935,2 MHz	PM/GSM, 217 Hz	0,3 – 0,4 W/kg	2 h	Lymphocytes (Human), in vitro	pos., partly s.s.	Maes et al. 1997
2,45 GHz	cw	100 W/m^2	120 d 6 h/d	Spermatogonia (Mouse), in vivo	neg.	Saunders et al. 1988
Mutations						
2,45 GHz	AM, 100 Hz	40 – 80 W/kg	2 h –6 h	Escherichia coli, in vitro	partly pos., s.s.	Anderstam et al. 1983
2,45 GHz	AM, 100 Hz	40 – 80 W/kg	4 h – 7 h	Salmonella typhimurium, in vitro	neg.	Anderstam et al. 1983
3,07 GHz	PM, 500 Hz	95 W/kg	1 h	Escherichia coli, in vitro	neg.	Anderstam et al. 1983
3,07 GHz	PM, 500 Hz	75 - 100 W/kg	2 h – 2,5 h	Salmonella typhimurium, in vitro	neg.	Anderstam et al. 1983
9,4 GHz	cw	600 W/m^2 23 W/kg	30 – 120 min	Escherichia coli, in vitro	neg.	Dardalhon et al. 1981
9,4 GHz	cw	600 W/m^2 23 W/kg	30 – 120 min	Saccharomyces cerevisiae, in vitro	partly pos., s.s.	Dardalhon et al. 1981
9,4 GHz	cw	10 – 600 W/m^2	330 min	Saccharomyces cerevisiae, in vitro	pos.	Dardalhon et al. 1985

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
2,45 GHz	AM, 100 Hz	130 W/kg	5,7 h	Salmonella typhimurium, in vitro	partly pos, s.s.	Hamnerius et al. 1985
3,10 GHz	PM, 500 Hz	90 W/kg	6 h	Salmonella typhimurium, in vitro	partly pos., n.s.	Hamnerius et al. 1985
2,45 GHz	AM, 100 Hz	110 W/kg	6 h	Drosophila melanogaster, in vivo	neg.	Hamnerius et al. 1985
3,10 GHz	PM, 500 Hz	60 W/kg	6 h	Drosophila melanogaster, in vivo	neg.	Hamnerius et al. 1985
2,375 MHz	cw	150.000 – 250.000 W/m^2	25 – 300 min	Drosophila melanogaster, in vivo	partly pos., s.s.	Marec et al. 1985
2,45	PM, 25 kHz	480 W/m^2 30 W/kg	bis 63 h	Leukaemia-Cells (Mouse), in vitro	pos./neg., partly s.s.	Meltz et al. 1989
2,45 GHz	PM, 25 kHz	650 – 870 W/m^2 40 – 40,8 W/kg	4 h	Leukaemia-Cells (Mouse), in vitro	neg.	Meltz et al. 1990

Table A.2 Effects of high frequency electromagnetic fields on cellular processes

Frequency	Modulation	Power Flux Density SAR	Exposure Duration	Examines Subject Method	Result	Ref.
Gene transcription and gene translation						
890 – 915 GHz	PM/GSM, 217 Hz	0,3 – 7,5 W/kg	4 h	Brain (Rat), in vivo	pos., partly s.s.	Fritze et al. 1997 a
835,62 MHz	FM/cw	0,6 W/kg	4 d	Fibroblasts (Mouse), in vitro	partly pos., s.s.	Goswami et al. 1999
847,74 MHz	PM/CDMA, 50 Hz	0,6 W/kg	4 d	Fibroblasts (Mouse), in vitro	partly pos., s.s.	Goswami et al. 1999
836,55 MHz	PM/TDMA, 50 Hz	0,9 – 90 W/m^2 0,00026 – 0,026 W/kg	20 – 100 min	Pheochromocytoma Cells (Rat), in vitro	pos., s.s.	Ivaschuk et al. 1997
Cell-Cycle						
380 MHz	PM, 17,65 Hz	80 W/kg	?	Lymphocytes (Human), in vitro	neg.	Antonopoulos et al. 1997
900 MHz	PM/DCS, 217 Hz	208 W/kg	?	Lymphocytes (Human), in vitro	neg.	Antonopoulos et al. 1997
1,8 GHz	PM/GSM, 217 Hz	1700 W/kg	?	Lymphocytes (Human), in vitro	neg.	Antonopoulos et al. 1997
2,45 GHz	PM, 25 kHz	490 W/m^2 33,8 W/kg	2 h	Egg Cells (Chinese Hamster), in vitro	neg.	Ciaravino et al. 1991
2,45 GHz	cw	5 – 25 W/kg	2 h	Egg Cells (Chinese Hamster), in vitro	pos., s.s.	Cleary et al. 1996
9,4 GHz	PM, 1,0 kHz	1 – 100 W/m^2	2 w 5 d/w 1 h/d	Mouse, in vivo	pos., s.s.	Manikowska et al. 1979
2,45 GHz	cw	100 W/m^2	6x1 h	Lymphocytes (Human), in vitro	neg.	Pazmany et al. 1990
2,45 GHz	cw	100 W/m^2	3x1 h	Lymphocytes (Human), in vitro	neg.	Pazmany et al. 1990
2,45 GHz	cw	100 W/m^2	5 h	Lymphocytes (Human), in vitro	pos., s.s.	Pazmany et al. 1990

Table A.3 Effects of high frequency electromagnetic fields on cell transformation and cell proliferation

Frequency	Modulation	Power Flux Density SAR	Exposure Duration	Studied Subject Method	Result	Ref.
Cell Transformations (including neoplastic)						
2,45 GHz	PM, 120 Hz	4,4 W/kg	24 h	Fibroblasts (Mouse), in vitro	partly pos., s.s.	Balcer-Kubiczek & Harrison 1985
2,45 GHz	PM, 120 Hz	4,4 W/kg	24 h	Fibroblasts (Mouse), in vitro	partly pos., s.s.	Balcer-Kubiczek & Harrison 1989
2,45 GHz	PM, 120 Hz	0,1 – 4,4 W/kg	24 h	Fibroblasts (Mouse), in vitro	partly pos., s.s.	Balcer-Kubiczek & Harrison 1991
2,45 GHz	cw	0,8 – 12,3 W/kg	5 d	Lymphocytes (Human), in vitro	neg.	Czerska et al. 1992
2,45 GHz	PM, 1000 Hz	0,8 – 12,3 W/kg	5 d	Lymphocytes (Human), in vitro	pos., s.s.	Czerska et al. 1992
2,45 GHz	cw	50 W/m^2		Lymphocytes (Mouse)	pos.	Smialowicz et al. 1979
Cell Communication						
836,55 MHz	PM, TDMA, 50 Hz	0,3 – 30 W/m^2 0,00015 - 0,015 W/kg	28 d	Fibroblasts (Mouse), in vitro	partly pos., s.s.	Cain et al. 1997
Cell Proliferation						
2,45 GHz	AM, 100 Hz	40 – 80 W/kg	2 h –6 h	Escherichia coli, in vitro	partly pos., s.s.	Anderstam et al. 1983
2,45 GHz	AM, 100 Hz	40 – 80 W/kg	4 h – 7 h	Salmonella typhimurium, in vitro	partly pos., s.s.	Anderstam et al. 1983
3,07 GHz	PM, 500 Hz	95 W/kg	1 h	Escherichia coli, in vitro	partly pos., s.s.	Anderstam et al. 1983
3,07 GHz	PM, 500 Hz	75 - 100 W/kg	2 h – 2,5 h	Salmonella typhimurium, in vitro	partly pos., s.s.	Anderstam et al. 1983
900 MHz	PM/GSM, 217 Hz	0,55 – 2,0 W/m^2 0,075 – 0,270 W/kg	10 d 2 h/d	Lymphocytes (Rat, (Sprague-Dawley), in vivo	neg.	Chagnaud & Veyret 1999
2,45	cw	5 – 50 W/kg	2 h	Blut (Human), Lymphocytes, in vitro	pos., s.s.	Cleary et al. 1990 a
2,45	cw	5 – 75 W/kg	2 h	Glioma-Cells, in vitro	pos. s.s.	Cleary et al. 1990 b

Frequency	Modulation	Power Flux Density SAR	Exposure Duration	Studied Subject Method	Result	Ref.
2,45 GHz	cw	5 – 50 W/kg	2 h	T-Lymphocytes (Mouse, CTLL-2), in vitro	pos., s.s.	Cleary et al. 1996
2,45 GHz	PM/PCS, 50 Hz	5 W/kg	2 h	T-Lymphocytes (Mouse, CTLL-2), in vitro	pos., s.s.	Cleary et al. 1996
2,45 GHz	?	?	15 s – 5 h	Myeloma- and Hybridoma-Cells (Mouse), in vitro	?, Methode fragwürdig	Dorp et al. 1998
150 MHz	AM, 72 Hz, 217 Hz, 1100 Hz	1,6 kV/m 5,4 µT		Escherichia coli, in vitro	pos., partly s.s.	Grospietsch et al. 1995
2,45 GHz	AM, 100 Hz	130 W/kg	5,7 h	Salmonella typhimurium,	pos, s.s.	Hamnerius et al. 1985
3,10 GHz	PM, 500 Hz	90 W/kg	6 h	Salmonella typhimurium,	pos., s.s.	Hamnerius et al. 1985
836,55 MHz	PM, TDMA, 50 Hz	0,9 – 90 W/m^2 0,00015 - 0,059 W/kg	4 h – 14 d	Glioma-Cells (Rat), in vitro	neg.	Stagg et al. 1997
960 MHz	PM, GSM, 217 Hz	0,0021 W/kg	30 min	transform. Epithel-Amnion-Cells (Human), in vitro	pos., (s.s)	Velizarov et al. 1999

Appendix B

Studies of the effects of high frequency electromagnetic fields on the central nervous system (Blood-Brain-Barrier)

Abbreviations

neg.	negative finding
n.s.	not statistically significant
pos.	positive finding
s.s.	statistically significant
partly	some findings
#	disagreement with the conclusions of the authors
?	unknown; not provided; unreliable

Table B.1 Effects of high frequency electromagnetic fields on the central nervous system

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
2,8 GHz	cw	100 W/m^2	2 h	Rat (Wistar)	pos.	Albert 1979
2,45 GHz	cw	100 W/m^2 2,5 W/kg	2 h	Hamster (Chin.)	pos., s.s.	Albert & Kerns 1981
900 MHz	PM/GSM, 217 Hz	0,3 – 7,5 W/kg	4 h	Rat (Wistar)	pos., partly s.s.	Fritze et al. 1997 b
2,8 GHz	cw	100 – 400 W/m^2	4 h	Rat (Tac:N(SD)sBR)	partly pos, n.s.	Gruenau et al. 1982
2,8 GHz	PM, 500 Hz	10 – 150 W/m^2	4 h	Rat (Tac:N(SD)sBR)	partly pos, n.s.	Gruenau et al. 1982
2,45 GHz	PM, 100 Hz	100 W/m^2 2 W/kg	30 min – 2 h	Rat (Sprague Dawley)	pos., s.s.	Neubauer et al. 1990
1,3 GHz	cw	3 – 30 W/m^2	20 min	Rat (Wistar)	pos., s.s.	Oscar & Hawkins 1977
1,3 GHz	PM, 5 Hz	0,3 – 0,5 W/m^2	20 min	Rat (Wistar)	pos., s.s.	Oscar & Hawkins 1977
1,3 GHz	PM, 1000 Hz	1 – 10 W/m^2	20 min	Rat (Wistar)	pos., s.s.	Oscar & Hawkins 1977
2,45 GHz	cw	1,0 – 300 W/m^2	30 min	Rat (Sprague-Dawley)	partly pos., s.s.	Preston et al. 1979
915 MHz	cw	0,3 – 5,0 W/kg	2 h	Rat (Fischer 344)	pos., s.s.	Salford et al. 1994
915 MHz	PM, 8 Hz	0,016 – 0,16 W/kg	2 h	Rat (Fischer 344)	pos., s.s.	Salford et al. 1994
915 MHz	PM, 16 Hz	0,03 – 2,1 W/kg	2 h	Rat (Fischer 344)	pos., s.s.	Salford et al. 1994
915 MHz	PM, 50 Hz	0,3 – 5,0 W/kg	2 h	Rat (Fischer 344)	pos., s.s.	Salford et al. 1994
915 MHz	PM, 200 Hz	0,4 – 2,9 W/kg	2 h	Rat (Fischer 344)	pos., s.s.	Salford et al. 1994

Appendix C

Studies of the Carcenogenic Effects of High Frequency Electromagnetic Fields in Animal Experiments

Abbreviations

neg.	negative finding
n.s.	not statistically significant
pos.	positive finding
s.s.	statistically significant
partly	some findings
#	disagreement with the conclusions of the authors
?	unknown; not provided; unreliable

Table C.1 Animal experiments regarding the carcenogenic effects of high frequency electromagnetic fields

Frequency	Modulation	Power Flux Density / SAR	Exposure duration	Studies subject / Method	Result	Ref.
836,55 MHz	PM/TDMA, 50 Hz	0,74 – 1,6 W/kg	24 mon 4 d/w 2 h/d	Rat (Fischer 344)	neg.	Adey et al. 1999
900 MHz	PM/GSM, 217 Hz	0,55 – 2,0 W/m^2	2 w, 2 h/d	Rat, Cancer, total	neg.	Chagnaud et al. 1999
2,45 GHz	PM, 800 Hz	0,15 – 0,4	25 mon	Rat, Cancer, total	pos., s.s.	Chou et al. 1992
2,45 GHz	cw	0,3 W/kg	18 mon, 7 d/w, 20 h/d	Mouse (C3H/HeJ), Cancer, total	neg.	Frei et al. 1998 a
2,45 GHz	cw	1,0 W/kg	78 w, 7 d/w, 20 h/d	Mouse (C3H/HeJ), Cancer, total	partly pos., n.s.	Frei et al. 1998 b
835,62 MHz	FM, cw	0,75 W/kg	150 d, 5 d/w, 4 h/d	Rat (Fischer 344), B16 Melanoma	partly pos., n.s.	Higashikubo et al. 1999
835,62 MHz	PM/CDMA, 50 Hz	0,75 W/kg	150 d, 5 d/w, 4 h/d	Rat (Fischer 344), B16 Melanoma	neg.	Higashikubo et al. 1999
929,2 MHz	PM/TDMA, 50 Hz	0,58 – 0,8	6 w, 5 d/w, 90 min/d	Rat (Fischer 344), Liver cancer	neg.	Imaida et al 1998 a
1,439 GHz	PM/TDMA, 50 Hz	0,453 - 0,680 W/kg	6 w, 5 d/w, 90 min/d	Rat (Fischer 344), Liver cancer	neg.	Imaida et al. 1998 b
900 MHz	PM/GSM, 217 Hz	2,6 – 13 W/m^2 0,008 – 4,2 W/kg	18 mon 30 min/d	Mouse (transgenic Eμ-Pim1), Lyphomas	pos., s.s.	Repacholi et al. 1997
915 MHz	PM, 4 – 217 Hz	0,0077 – 1,0 W/kg	2-3 w 5d/w 7h/d	Rat (Fischer 344), Brain Tumor	partly pos., n.s.	Salford et al. 1993
2,45 GHz	cw	10 W/m^2 1,2 W/kg	max. 46 w, 6 d/w, 2,5 h/d	Mouse (C57BL/6J), B16 Melanoma	partly pos., n.s.	Santini et al. 1988
2,45 GHz	PM, 25 Hz	10 W/m^2 1,2 W/kg	max. 46 w, 6 d/w, 2,5 h/d	Mouse (C57BL/6J), B16 Melanoma	partly pos., n.s.	Santini et al. 1988
2,45 GHz	cw	50 – 150 W/m^2 2 – 8 W/kg	12 mon 6d/w, 2h/d	Mouse (C3H/HeA), Cancer, total	pos., s.s.	Szmigielski et al. 1982
2,45 GHz	cw	50 – 150 W/m^2 2 – 8 W/kg	5 mon 6d/w, 2h/d	Mouse (Balb/c), Skin Cancer	pos., s.s.	Szmigielski et al. 1982

2,45 GHz	cw	50 – 150 W/m^2	6 mon, 2 h/d	Mouse (Balb/c), Hautcancer	pos., s.s.	Szudinski et al. 1982
435 MHz	PM, 1,0 kHz	10 W/m^2 0,32 W/kg	21 mon	Mouse (C3H/HeJ), Chest tumors, Ovarian tumors	partly pos., s.s.	Toler et al. 1997
2,45 GHz	cw	100 W/m^2 11 W/kg	5 mon, 6 d/w, 3 h/d	Mouse (Balb/c), Intestinal cancer	partly pos., n.s.	Wu et al. 1994

Appendix D

Epidemiological Studies of the health Risks of HF EMFs

Table D.1 Overview of the results of epidemiological studies regarding exposures in the high frequency spectrum and health risks

Column 1: studied illness

Column 2: Exposure situation

Column 3: Reliability of the exposure classification:

- 3: Source of exposure and quantity clearly identified,
- 2: Method of exposure clearly identified
- 1: HF-exposure probable

Column 4: Relative Risk (R.R.), Explanations see text

Column 5: Statistical significance of the findings:

- s.s.: statistically significant(R.R.=1 outside of 95 %-trust interval, or. $p<0,05$
- n.s.: statistically not significant

Column 6: Literatur reference

Column 7: Comments:

- R: Values in the Column R.R. obtained by conversion (reciprocal value, proportion) of other numerical values or via the interpretation of diagrams
- *: Paper listed in the literature references of Appendix E

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
All Illnesses						
All illnesses, morbidity	MW, Radar, Military	2	1,18	n.s.	Robinette et al. 1980	R*
All Illnesses, morbidity	MW, mobile telecommunications	3	0,93	n.s.	Rothman et al. 1996	
Cancer, total						
Cancer, total, morbidity	MW, Radar, Military	2	1,50	n.s.	Robinette et al 1980	R*
Cancer, total, Incidence	RF, Radio, women	2	1,2	s.s.	Tynes et al. 1996	*
Cancer, total, Incidence	RF/MW, Military	2	2,07	s.s.	Szmigielski 1996	*
Cancer, total, Incidence	HF, Radio and TV transmitters, local residents	3	1,09	s.s.	Dolk et al. 1997 a	*
Cancer, total, Incidence	HF, place of work	1	2,0	n.s.	Lagorio et al. 1997	
Cancer, total, Incidence	RF/MW, Radar and Radio, Police	2	0,96	n.s.	Finkelstein 1998	*
Multiple Myelome	HF, Radio and TV transmitter, local residents	3	1,23	n.s.	Dolk et al. 1997 a	*
Brain tumors, total and tumors of the nervous system, total						
Brain-Tumors, total, Morbidity	HF, Place of work	1	1,54	n.s.	Lin et al. 1985	
Brain-Tumors, Glioblastomas and Astrocytoma, Morbidity	HF, Place of work	1	2,15	s.s.	Lin et al. 1985	
Brain-Tumors, total, Morbidity	HF, Place of work, Men	1	0,38	n.s.	Milham 1985	
Brain-Tumors, total, Morbidity	RF/MW, Place of work, Men	2	2,3	s.s.	Thomas et al. 1987	*
Brain-Tumors, total, Morbidity	RF, Amateur Radio Users	2	1,39	n.s.	Milham 1988	
Brain-Tumors, total, Incidence	HF, Place of work	1	2,9	s.s.	Törnqvist et al. 1991	
Brain-Tumors, Glioblastomas, Incidence	HF, Place of work	1	3,4	s.s.	Törnqvist et al. 1991	
Brain-Tumors, total, Incidence	RF, Place of work, Men	2	0,61	n.s.	Tynes et al. 1992	
Brain-Tumors, total, Incidence	RF, Radio, Women	2	1,0		Tynes et al. 1996	*
Brain-Tumors, total, Incidence	HF, Place of work, Men	1	2,4	s.s.	Beall et al. 1996	
Brain-Tumors, total, Incidence	RF/MW, Military	2	1,39	s.s.	Grayson 1996	*

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
Brain-Tumors, total, Morbidity	HF/MW, TV transmitters and others residents (adults)	3	0,89	n.s.	Hocking et al. 1996	*
Brain-Tumors, total, Incidence	HF/MW, TV and other transmitters, Local residents/ Adults	3	0,82	n.s.	Hocking et al. 1996	*
Brain-Tumors, total, Morbidity	HF/MW, TV and other transmitters, Local residents/child.	3	1,0		Hocking et al. 1996	*
Brain-Tumors, total, Incidence	HF/MW, TV and other transmitters, Local residents/child.	3	1,3	n.s.	Hocking et al. 1996	*
Tumors des Nervensystems einschl. Hirntumors, Incidence	RF/MW, Military	2	1,91	s.s.	Szmigielski 1996	*
Brain-Tumors, total, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,29	n.s.	Dolk et al. 1997 a	*
Brain-Tumors, maligne, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,31	n.s.	Dolk et al. 1997 a	*
Brain-Tumors, total, Incidence	RF/MW, Radar and Radio, Police	2	0,84	n.s.	Finkelstein 1998	*
Brain-Tumors, total, Incidence	MW, Mobil telecommunications, Mobile phones	3	1,20	n.s.	Hardell et al. 1999	*
Brain-Tumors, Expos.seite, Incidence	MW, Mobilradio, Handy	3	R 2,45 L 2,40	n.s. n.s.	Hardell et al. 1999	*
Cancer, Eyes						
Melanome, Augen, Incidence	MW, Radar, Military	1	2,1	s.s.	Holly et al. 1995	
Cancer of the respiratory system, lung cancer						
Cancer der Atmungsorgane, Morbidity	MW, Radar, Military	2	2,59	s.s.	Robinette et al. 1980	R*
Lungencancer, Morbidity	HF, Place of work, Men	1	0,80	n.s.	Milham 1985	
Lungencancer, Incidence	RF, Radio, Women	2	1,2	n.s.	Tynes et al. 1996	*
Lungencancer, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,01	n.s.	Dolk et al. 1997 a	*
Lungencancer, Incidence	RF/MW, Radar and Radio, Police	2	0,66	s.s.	Finkelstein 1998	*
Chest cancer, Men						
Brustcancer, Mönner, Incidence	HF, Place of work	1	2,9	n.s.	Demers et al. 1991	

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
Brustcancer, Men, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,64	n.s.	Dolk et al. 1997 a	*
Breast cancer, Women						
Brustcancer, Women, Morbidity	HF, Place of work	2	1,15	s.s.	Cantor et al. 1995	*
Brustcancer, Women, Incidence	RF, Radio, Women	2	1,5	s.s.	Tynes et al. 1996	*
Brustcancer, Women, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,08	n.s.	Dolk et al. 1997 a	*
Cancer of the lymphatic and blood forming systems, total						
Cancer des lymphat. and des blutbild. Systems, Morbidity	MW, Radar, Military	2	1,98	n.s.	Robinette et al. 1980	R*
Cancer des lymphat. and des blutbild. Systems, Morbidity	HF, Place of work, Men	1	1,37	n.s.	Milham 1985	
Cancer des lymphat. and des blutbild. Systems, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,21	n.s.	Dolk et al. 1997 a	*
Cancer des lymphat. and des blutbild. Systems, Incidence	RF/MW, Military	2	6,31	s.s.	Szmigielski 1996	*
Leukaemia, total						
Leukaemia, total, Morbidity	HF, Place of work	1	1,11	n.s.	Milham 1982	
Leukaemia, total, Morbidity	RF, Amateur radio user	2	1,91	s.s.	Milham 1985 a	
Leukaemia, total, Morbidity	HF, Place of work, Men	1	1,02	n.s.	Milham 1985 b	
Leukaemia, total, Morbidity	RF Amateur radio user	2	1,24	n.s.	Milham 1988	
Leukaemia, total, Incidence	HF, Military	1	2,4	s.s.	Garland et al. 1990	
Leukaemia, total, Incidence	HF, Place of work	1	0,8	n.s.	Törnqvist et al. 1991	
Leukaemia, total, Incidence	RF, Place of work, Men	2	2,85	s.s.	Tynes et al. 1992	
Leukaemia, total, Incidence	RF, Radio, Women	2	1,1	n.s.	Tynes et al. 1996	*
Leukaemia, total, Morbidity	RF/MW, TV and other transmitters, Local residents/ Adults	3	1,17	n.s.	Hocking et al. 1996	*
Leukaemia, total, Morbidity	RF/MW, TV and other transmitters, Local residents/ children.	3	2,32	s.s.	Hocking et al. 1996	*
Leukaemia, total, Incidence	RF/MW, TV and other transmitters , Local residents/	3	1,24	s.s.	Hocking et al. 1996	*

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
	Adults					
Leukaemia, total, Incidence	RF/MW, TV and other transmitters, Local residents/ Children.	3	1,58	s.s.	Hocking et al. 1996	*
Leukaemia, total, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,83	s.s.	Dolk et al. 1997 a	*
Leukaemia and Non-Hodgkin-Lymphoma, total, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	1,25	n.s.	Dolk et al. 1997 a	*
Leukaemia, total, Incidence	RF/MW, Radar and Radio, Police	2	0,6	n.s.	Finkelstein 1998	*
Leukaemia, total, Incidence	RF/MW, TV and other transmitters, Local residents/ children.	3	1,47	n.s.	McKenzie et al. 1998	*
Acute Leukaemia, total						
Acute Leukaemia, total, Morbidity	HF, Place of work	1	2,39	n.s.	Milham 1982	
Acute Leukaemia, total, Morbidity	HF, Place of work, Men	1	2,12	n.s.	Milham 1985	
Acute Unspez. Leukaemia, Morbidity	RF, Amateur radio users	2	1,76	n.s.	Milham 1988	
Acute Leukaemia, total, Incidence	HF, TV and Radio transmitters, Local residents	3	1,86	n.s.	Dolk et al. 1997 a	*
Lymphat. Leukaemia, total						
Lymphat. Leukaemia, total, Morbidity	RF, Amateur radio users	2	0,77	n.s.	Milham 1985	
Lymphat. Leukaemia, total, Morbidity	RF, Amateur radio users	2	1,03	n.s.	Milham 1988	
Lymphat. Leukaemia, total, Morbidity	RF/MW, TV and other transmitters, Local residents/ Adults	3	1,39	s.s.	Hocking et al. 1996	*
Lymphat. Leukaemia, total, Morbidity	RF/MW, TV and other transmitters, Local residents/ children.	3	2,74	s.s.	Hocking et al. 1996	*
Lymphat. Leukaemia, total, Incidence	RF/MW, TV and other transmitters, Local residents/ Adults	3	1,32	s.s.	Hocking et al. 1996	*
Lymphat. Leukaemia, total, Incidence	RF/MW, TV and other transmitters, Local residents/ children	3	1,55	s.s.	Hocking et al. 1996	*

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
Lymphat. Leukaemia, total, Incidence	RF/MW, TV and other transmitters, Local residents /children.	3	1,53	n.s.	McKenzie et al. 1998	*
Acute Lymphat. Leukaemia						
Acute Lymphat. Leukaemia, Morbidity	RF, Amateur radio users	2	1,20	n.s.	Milham 1988	
Acute Lymphat. Leukaemia, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	3,57	n.s.	Dolk et al. 1997 a	*
Chron. Lymphat. Leukaemia						
Chron. Lymphat. Leukaemia, Morbidity	RF, Amateur radio users	2	1,43	n.s.	Milham 1985	
Chron. Lymphat. Leukaemia, Morbidity	RF, Amateur radio users	2	1,09	n.s.	Milham 1988	
Chron. Lymphat. Leukaemia, Incidence	HF, Place of work	1	1,3	n.s.	Törnqvist et al. 1991	
Chron. Lymphat. Leukaemia, Incidence	HF, Sender Radio and Fernsehen, Local residents	3	2,56	s.s.	Dolk et al. 1997 a	*
Myelo. Leukaemia, total						
Myelo. Leukaemia, total, Morbidity	RF, Amateur radio users	2	2,81	s.s.	Milham 1985	
Myelo. Leukaemia, total, Morbidity	RF, Amateur radio users	2	1,40	n.s.	Milham 1988	
Myelo. Leukaemia, total, Morbidity	RF/MW, TV and other transmitters, Local residents/ Adults	3	1,01	n.s.	Hocking et al. 1996	*
Myelo. Leukaemia, total, Morbidity	RF/MW, TV and other transmitters, Local residents/child.	3	1,77	n.s.	Hocking et al. 1996	*
Myelo. Leukaemia, total, Incidence	RF/MW, TV and other transmitters, Local residents/ Adults	3	1,09	n.s.	Hocking et al. 1996	*
Myelo. Leukaemia, total, Incidence	RF/MW, TV and other transmitters, Local residents/child.	3	1,73	n.s.	Hocking et al. 1996	*
Acute Myelo. Leukaemia						
Acute Myelo. Leukaemia, Morbidity	RF, Amateur radio users	2	2,89	s.s.	Milham 1985	
Acute Myelo. Leukaemia, Morbidity	RF, Amateur radio users	2	1,76	s.s.	Milham 1988	
Acute Myelo. Leukaemia, Incidence	HF, Place of work	1	2,1	n.s.	Törnqvist et al. 1991	
Acute Myelo. Leukaemia, Incidence	HF, Radio, TV, Local residents	3	1,02	n.s.	Dolk et al. 1997	*

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
Chron. Myelo. Leukaemia						
Chron. Myelo. Leukaemia, Morbidity	RF, Amateur radio users	2	2,67	s.s.	Milham 1985	
Chron. Myelo. Leukaemia, Morbidity	RF, Amateur radio users	2	0,86		Milham 1988	
Chron. Myelo. Leukaemia, Incidence	HF, Radio and TV transmitters, Local residents	3	1,23	n.s.	Dolk et al. 1997	*
Leukaemia, non-lymph. and non-myelo.						
Leukaemia, non-lymph. and non-myelo., Morbidity	RF/MW, TV and other transmitters, Local residents/ Adults	3	1,57	s.s.	Hocking et al. 1996	*
Leukaemia, non-lymph. and non-myelo., Morbidity	RF/MW, TV and other transmitters, Local residents/child.	3	1,45	n.s.	Hocking et al. 1996	*
Leukaemia, non-lymph. and non-myelo., Incidence	RF/MW, TV and other transmitters, Local residents/ Adults	3	1,67	s.s.	Hocking et al. 1996	*
Leukaemia, non-lymph. and non-myelo., Incidence	RF/MW, TV and other transmitters, Local residents/child.	3	1,65	n.s.	Hocking et al. 1996	*
Lymphomas, Hodgkin-Syndrome						
Lymphosarkome, Morbidity	HF, Place of work, Men	1	0,73	n.s.	Milham 1985	
Lymphome, excl. Lymphosarkoma, Morbidity	HF, Place of work, Men	1	3,42	n.s.	Milham 1985	
Hodgkin-Syndrome, Morbidity	RF, Amateur radio users	2	1,23	n.s.	Milham 1988	
Other malignant illness of the lymphat. tissues, Morbidity	RF, Amateur radio users	2	1,62	s.s.	Milham 1988	
Lymphomas, total, Incidence	RF, Radio, Women	2	1,3	n.s.	Tynes et al. 1996	*
Hodgkin-Syndrome, Incidence	RF/MW, Radar and Radio, Police	2	0,84	n.s.	Finkelstein 1998	*
Non-Hodgkin-Lymphoma, Incidence	HF, Radio and TV transmitters, Local residents	3	0,66	n.s.	Dolk et al. 1997 a	*
Testicular cancer						
Testicular cancer, Incidence	RF/MW, Place of work	2	3,1	s.s.	Hayes et al. 1990	
Germ cell-Carcinoma, Seminoma	RF/MW, Place of work	2	2,8	n.s.	Hayes et al. 1990	
Germ cell-Carzinome, others	RF/MW, Place of work	2	3,2	s.s.	Hayes et al. 1990	

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
Testicular cancer, Incidence	MW, Radar, Police	2	6,9	s.s.	Davis & Mostofi 1993	*
Testicular cancer, Incidence	RF/MW, Radar and Radio, Police	2	1,33	s.s.	Finkelstein 1998	*
Cancer of the uterus						
Cancer of the uterus, Incidence	RF, Radio, Women	2	1,9	s.s.	Tynes et al. 1996	*
Skin cancer						
Skin Cancer, Malignant Melanoma, Incidence	RF, Radio, Women	2	0,9	n.s.	Tynes et al. 1996	*
Skin Cancer, total, Incidence	RF/MW, Military	2	1,67	n.s.	Szmigielski 1996	*
Skin cancer, Malignant Melanoma, Incidence	HF, Radio and TV transmitters, Local residents	3	1,43	n.s.	Dolk et al. 1997 a	*
Skin cancer, Malignant Melanoma, Incidence	RF/MW, Radar and Radio, Police	2	1,37	s.s.	Finkelstein 1998	*
Heart and cardio vascular diseases						
Cardio vascular diseases, Morbidity	MW, Radar, Military	2	1,09	n.s.	Robinette et al. 1980	R*
Cardio vascular diseases, Morbidity	RF, Amateur radio users	2	0,70	s.s.	Milham 1988	
Abnorm. Hearbeat rate variability	RF/AM, Radio transmitters, Place of work	2	1,6	s.s.	Bortkiewicz et al. 1996	*
Abnormal ECG	MW	2	2,9	?	Zhao et al. 1994	R
Cardio vascular complaints	MW	2	3,2	?	Zhao et al. 1994	R
Infertility, reduced fertility, Men						
reduced Fertility, reduced Sperm count	MW, Place of work	2	1,20	s.s.	Lancranjan et al. 1975	R
reduced Fertility, immob. Spermatozoa	MW, Place of work	2	1,39	s.s.	Lancranjan et al. 1975	R
reduced Fertility, normal Spermatozoa	MW, Place of work	2	1,18	s.s.	Lancranjan et al. 1975	R
reduced. Fertility, reduced Sperm count	MW, Military	2	2,70	s.s.	Weyandt et al. 1996	R
reduced Fertility, reduced sperm count	MW, Radar	2	1,54	n.s.	Hjollund et al. 1997	R
reduced Fertility, immob. Spermatozoa	MW, Radar	2	1,58	n.s.	Hjollund et al. 1997	R
reduced Fertility, reduced Sperm count	MW, Radar	2	1,10	n.s.	Schrader et al 1998	R

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
Infertility, reduced. fertility, Women						
reduced. fertilityt	KW, Place of work, Physiotherapie, Mothers	2	1,7	n.s.	Larsen et al. 1991 a	*
Miscarriages, Stillbirths, Malformations and other abnormalities of newborns						
Malformations and perinatal death	KW, Place of work, Mother	2	2,36	s.s.	Källén et al 1982	
Miscarriage	MW, Place of work, Mother	2	1,28	s.s.	Ouellet-Hellstrom & Stewart 1993	*
Miscarriage	KW, Place of work, Mother	2	1,07	n.s.	Ouellet-Hellstrom & Stewart 1993	*
Cancer, Offspring (parental exposure)						
Tumors of the nervous system	HF, Place of work, fathers	1	2,01	n.s.	Cole Johnson & Spitz 1989	
Cancer, total, Incidence	Radar, Place of work, fathers	2	2,3	s.s.	Smulevich et al. 1999	*
Neurodegenerative Diseases						
Alzheimer's, Morbidity	HF, Place of work	1	1,5	n.s.	Savitz et al. 1998	*
Parkinson's Disease	HF, Place of work	1	-		Savitz et al. 1998	*
Amyotrophic Lateral Sklerosis	HF, Place of work	1	-		Savitz et al. 1998	*
Disturbances of motoric and psychological reactions, Unwellness						
Reduced stamina, Boys	MW, Radar	2	1,38	s.s.	Kolodynski & Kolodynska 1996	R*
Reduced stamina, Girls	MW, Radar	2	1,38	s.s.	Kolodynski & Kolodynska 1996	R*
reduced memory, Boys	MW, Radar	2	1,09	s.s	Kolodynski & Kolodynska 1996	R*
Reduced memory, Girls	MW, Radar	2	1,12	s.s	Kolodynski & Kolodynska 1996	R*
Reduced concentration, Boys	MW, Radar	2	1,23	s.s.	Kolodynski & Kolodynska 1996	R*

Illness	Exposure	Exp. class.	R.R.	stat. Sign.	References	C
Reduced Concentration, Girls	MW, Radar	2	1,20	s.s.	Kolodynski & Kolodynska 1996	R*
Extended reaction time, Boys	MW, Radar	2	1,07	n.s.	Kolodynski & Kolodynska 1996	R*
Extended reaction time, Girls	MW, Radar	2	1,12	s.s.	Kolodynski & Kolodynska 1996	R*
Unwellness. ('Neurosis')	MW	2	3,2	?	Zhao et al. 1994	R

Appendix E (only available in German)

Extracts of our database (EMFbase)

Important research papers relevant to the assessment of health risks resulting from exposure to the electromagnetic fields of mobile telecommunications under the aspect of precautionary health protection