



An Exelon Company

Richard G. Webster, Jr.
Vice President
Regulatory Policy and Strategy

Telephone 215.841.4000 ext 5777
Fax 215.841.6208
www.peco.com
dick.webster@peco-energy.com

PECO
2301 Market Street, 515
Philadelphia, PA 19103

January 18, 2013

VIA e-FILING

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

**Re: Petition Of PECO Energy Company For Approval Of Its Smart Meter Universal
Deployment Plan
Docket No. M-2009-2123944**

Dear Secretary Chiavetta:

PECO Energy Company is hereby e-filing the *Petition Of PECO Energy Company For Approval Of Its Smart Meter Universal Deployment Plan* ("Petition"), including the following accompanying documents:

1. **PECO Statement No. 1** – Direct Testimony Of Michael Innocenzo
2. **PECO Statement No. 2** – Direct Testimony Of Michael J. Trzaska
3. **Exhibit MJT-1** – Accompanying The Direct Testimony Of Mr. Trzaska
4. **PECO Statement No. 3** – Direct Testimony Of Alan B. Cohn
5. **Exhibits ABC-1 and ABC 2** – Accompanying The Direct Testimony Of Mr. Cohn
6. **PECO Exhibit 1** – Smart Meter Universal Deployment Plan

Additionally, as evidenced by the enclosed Certificate of Service, copies of the enclosed Petition and accompanying testimony and exhibits are being served upon the Bureau of Investigation and Enforcement, the Office of Consumer Advocate, the Office of Small Business Advocate and the parties to PECO Energy Company's prior Smart Meter proceeding at the above-referenced docket.

Rosemary Chiavetta, Secretary
January 18, 2013
Page 2

If you have any questions regarding this filing, please contact me at 215-841-5777.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Webster, Jr.", with a long horizontal flourish extending to the right.

Richard G. Webster, Jr.
Vice President
Regulatory Policy & Strategy

Enclosures.

cc: Per Certificate of Service

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

PETITION OF PECO ENERGY :
COMPANY FOR APPROVAL OF ITS :
SMART METER UNIVERSAL : **DOCKET NO. M-2009-2123944**
DEPLOYMENT PLAN :

CERTIFICATE OF SERVICE

I hereby certify and affirm that I have this day served a copy of the **Petition of PECO Energy Company For Approval Of Its Smart Meter Universal Deployment Plan** upon the following persons in the manner specified in accordance with the requirements of 52 Pa. Code § 1.54:

VIA ELECTRONIC AND FIRST CLASS MAIL

Tanya J. McCloskey
Acting Consumer Advocate
Office of Consumer Advocate
555 Walnut Street
5th Floor, Forum Place
Harrisburg, PA 17101-1923
tmccloskey@paoca.org

Johnnie E. Simms
Chief Prosecutor
Pennsylvania Public Utility Commission
Bureau of Investigation and Enforcement
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120
josimms@pa.gov

Charis Mincavage
Adeolu E. Bakare
McNees Wallace & Nurick LLC
100 Pine Street
P.O. Box 1166
Harrisburg, PA 17108-1166
cmincavage@mwn.com
abakare@mwn.com

David Raphael
Chief Counsel
Commonwealth of Pennsylvania
Department of Environmental Protection
RCSOB, 9th Floor
400 Market Street
Harrisburg, PA 17101-2301
daraphael@pa.gov

*Counsel for the Philadelphia Area
Industrial Energy Users Group*

*Counsel for the Department of Environmental
Protection*

Stephen Gray
Acting Small Business Advocate
Office of Small Business Advocate
Suite 1102, Commerce Building
300 North Second Street
Harrisburg, PA 17101
sgray@pa.gov

Harry S. Geller
Pennsylvania Utility Law Project
118 Locust Street
Harrisburg, PA 17101-1414
hgellerpulp@palegalaid.net

*Counsel for Pennsylvania Association of
Community Organizations for Reform Now*



Romulo L. Diaz, Jr., Esquire
(Pa. No. 88795)
Anthony E. Gay, Esquire
(Pa. No. 74624)
W. Craig Williams, Esquire
(Pa. No. 306405)
PECO Energy Company
2301 Market Street
P.O. Box 8699
Philadelphia, PA 19101-8699
Phone: 215.841.6857
Fax: 215.568.3389
E-mail: Romulo.Diaz@Exeloncorp.com

Counsel for PECO Energy Company

Date: January 18, 2013

Joseph Otis Minott
Clean Air Council
135 S. 19th Street
Suite 300
Philadelphia, PA 19103
joe_minott@cleanair.org

Counsel for Clean Air Council

Divesh Gupta
Managing Counsel – Regulatory
Constellation Energy
100 Constellation Way, Suite 500C
Baltimore, MD 21202
divesh.gupta@constellation.com

*Counsel for Constellation NewEnergy, Inc. and
Constellation Energy Commodities Group, Inc.*

Thomas P. Gadsden, Esquire
(Pa. No. 28478)
Anthony C. DeCusatis, Esquire
(Pa. No. 25700)
Brooke E. McGlenn
(Pa. No. 204918)
Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103-2921
Phone: 215.963.5234
Fax: 215.963.5001
E-mail: tgadsden@morganlewis.com

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**PETITION OF PECO ENERGY :
COMPANY FOR APPROVAL OF : DOCKET NO. M-2009-2123944
ITS SMART METER UNIVERSAL :
DEPLOYMENT PLAN :**

**PETITION
AND
DIRECT TESTIMONY AND EXHIBITS**

PETITION OF PECO ENERGY COMPANY

PECO Statement No. 1	Direct Testimony of Michael Innocenzo
PECO Statement No. 2	Direct Testimony of Michael J. Trzaska
Exhibit MJT-1	Estimated Cost-Benefit Analysis For Phase Two Smart Meter Deployment
PECO Statement No. 3	Direct Testimony of Alan B. Cohn
Exhibit ABC-1	List Of Prior Testimony
Exhibit ABC-2	Estimated State Tax Flow Through Impact From Accelerated AMR Depreciation
PECO Exhibit 1	Smart Meter Universal Deployment Plan

January 18, 2013

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**PETITION OF PECO ENERGY COMPANY :
FOR APPROVAL OF ITS SMART METER : DOCKET NO. M-2009-2123944
UNIVERSAL DEPLOYMENT PLAN :**

**PETITION FOR APPROVAL OF
PECO ENERGY COMPANY'S SMART METER UNIVERSAL DEPLOYMENT PLAN**

PECO Energy Company ("PECO" or the "Company") hereby petitions the Pennsylvania Public Utility Commission ("PUC" or the "Commission") to approve the second phase ("Phase Two") of its Smart Meter Technology Procurement and Installation Plan (the "Smart Meter Plan" or "Plan"). As set forth in the accompanying Smart Meter Universal Deployment Plan (PECO Exhibit 1) ("Universal Deployment Plan"), PECO proposes to substantially complete the installation of electric smart meters across its service territory by the end of 2014 at an estimated cost of approximately \$282 million.

PECO has completed, or is on schedule to complete, all of the elements of the first phase of its Commission-approved Smart Meter Plan ("Phase One"). For Phase Two, PECO has developed a Universal Deployment Plan that appropriately balances the costs, benefits and risks associated with installing smart meter technology throughout its service territory. In order to achieve the schedule proposed in PECO's Universal Deployment Plan, it is essential that the Commission grant timely approval of Phase Two of PECO's Smart Meter Plan. For that reason and because the principal components of PECO's Smart Meter Plan, including its cost-recovery mechanism, were reviewed and approved by the Commission less than three years ago, the Company requests that Phase Two of its Plan be considered on a schedule that would support

substantial completion of universal deployment of smart meters in PECO’s service territory by the end of 2014.

I. INTRODUCTION

1. PECO is a corporation organized and existing under the laws of the Commonwealth of Pennsylvania with its principal office in Philadelphia, Pennsylvania. PECO provides electric delivery service to approximately 1.6 million customers and natural gas delivery service to approximately 475,000 customers in Pennsylvania.

2. On October 15, 2008, then Governor Edward G. Rendell signed into law Act 129 of 2008 (“Act 129”), which, in relevant part, amended Sections 2806 and 2807 of the Pennsylvania Public Utility Code. On June 24, 2009, the Commission entered an order that established standards and provided guidance for implementing the smart meter requirements of Act 129. *See Smart Meter Procurement and Installation*, Docket No. M-2009-2092655 (Order entered June 24, 2009) (“Implementation Order”).

3. Act 129 requires electric distribution companies (“EDCs”) with at least 100,000 customers to furnish “smart meter technology,” as defined in Section 2807(g), to all of their customers “[i]n accordance with a depreciation schedule not to exceed 15 years.” 66 Pa.C.S. § 2807(f)(2). It also requires such EDCs to install smart meters “in new building construction” and to furnish smart meter technology to any customer upon request if the customer agrees to pay the applicable cost. *Id.* Amended Section 2807(f)(3) further mandates EDCs, with customer consent, to enable third parties, such as electric generation suppliers (“EGSs”) and vendors of conservation and load management services, to have “direct meter access and electronic access to customer meter data.” EDCs were directed to file a plan within nine months of that section’s

effective date (i.e., by August 14, 2009), describing how they proposed to satisfy the foregoing smart meter requirements.

4. Act 129 provides that an EDC is entitled to full and current recovery of its reasonable and prudent costs of providing smart meter technology, net of operational and capital cost savings actually realized by the EDC from the use of smart meter technology. 66 Pa.C.S. § 2807(f)(7). Recoverable costs include annual depreciation and capital costs over the life of the smart meter technology and the costs of any system upgrades required to enable the use of the smart meter technology. *Id.* EDCs were authorized to recover their net costs, upon their election, either: (1) on a current basis through a Section 1307 reconcilable surcharge; or (2) in base rates with authority to defer costs incurred between base rate cases. *Id.*

5. The Commission established a 30-month “grace period” after a smart meter plan is approved for EDCs to develop and install smart meter networks. Implementation Order, Slip Op. at 7. In the same order, the Commission also provided detailed plan requirements, including key milestones that should be addressed within the 30-month grace period and smart meter capabilities that an EDC’s smart meter technology must support. *Id.* at 7-8, 15-17. The Implementation Order included guidance on smart meter plan cost recovery and cost allocation. *Id.* at 28-33.

6. On August 14, 2009, PECO filed its initial Smart Meter Plan, which PECO proposed to implement in two phases. Phase One, to span the 30-month grace period, would focus on selecting the smart meter technology to be deployed; implementing a meter data management system (“MDMS”) and other information technology (“IT”) investments; testing and validating the smart meter technology; deploying the advanced metering infrastructure (“AMI”) communication network (“AMI Network”); initially deploying at least 100,000, and

perhaps up to 600,000, smart meters; and developing a program to educate customers and to implement initial dynamic pricing options. Phase Two of the Plan, in turn, would comprise the universal deployment of smart meters throughout PECO's service territory.

7. Concomitant with the filing of PECO's Smart Meter Plan in 2009, PECO also applied for a \$200 million Smart Grid Investment Grant ("SGIG") from the Department of Energy ("DOE") under the American Recovery and Reinvestment Act of 2009 ("ARRA"). In November 2009, DOE informed PECO that it would receive the \$200 million SGIG for which it applied. Approximately \$140 million of the SGIG is being applied to the net costs of PECO's smart meter deployment in Phase One of its Plan¹. As committed in PECO's Smart Meter Plan, PECO has used a substantial portion of those grant funds to expand its initial deployment of smart meters in Phase One from 100,000 to 600,000 meters. Because of its receipt of the SGIG, PECO also committed to universal deployment of smart meters within ten years, rather than fifteen years as permitted by Act 129.

8. PECO's Smart Meter Plan was assigned to the Office of Administrative Law Judge for hearing and an Initial Decision. Numerous parties intervened in the proceeding, submitted comments, conducted discovery, filed written testimony and participated in technical and evidentiary hearings. From that process, a partial settlement was reached resolving all but two issues ("Smart Meter Settlement"), which related to the allocation among, and recovery from, each customer class of certain common costs.

9. On January 28, 2010, presiding Administrative Law Judge Marlane R. Chestnut issued an Initial Decision recommending that the Smart Meter Settlement be approved and that the common costs in question be allocated on the basis of the number of customers in each

¹ The remaining \$60 million of SGIG funds from the DOE are being applied to the costs of PECO's Smart Grid investment.

customer class. By Orders entered May 6, 2010 and June 3, 2010, the Commission approved the Company's proposed Smart Meter Plan, as modified by the Smart Meter Settlement; affirmed Judge Chestnut's recommendations regarding the allocation of costs and design of rates; and directed PECO to work with the Commission's Electronic Data Exchange Working Group to develop appropriate enrollment and electronic data interchange transaction protocols. *Petition of PECO Energy Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123944 (hereafter, the "Phase One Orders").

10. As previously explained, as part of its initial Smart Meter Plan, PECO proposed to deploy smart meter technology in two phases. That concept, as well as the specific elements of Phase One, were approved in the Phase One Orders. As contemplated by the Company's initial Smart Meter Plan and the Commission's Phase One Orders approving it, PECO has developed, and is submitting with this Petition, its proposals for Phase Two of its Smart Meter Plan. Accordingly, this Petition describes PECO's recommended full-scale deployment of smart meters and explains the net benefits of doing so on the schedule set forth in PECO's Universal Deployment Plan. In further support of its Phase Two filing, PECO is submitting the following statements and exhibits, which are attached hereto and incorporated herein by reference:

- PECO Statement No. 1** – Direct Testimony of Michael Innocenzo, PECO Senior Vice President, Operations
- PECO Statement No. 2** – Direct Testimony of Michael J. Trzaska, Principal Regulatory and Rates Specialist for PECO
- Exhibit MJT-1 Estimated Cost-Benefit Analysis for Phase Two Smart Meter Deployment
- PECO Statement No. 3** – Direct Testimony of Alan B. Cohn, Manager of Revenue Analysis in the PECO Regulatory Group
- Exhibit ABC-1 List Of Prior Testimony
- Exhibit ABC-2 Estimated State Tax Flow-Through Impact from Accelerated AMR Depreciation

II. PHASE ONE OF PECO'S SMART METER PLAN

11. In the period since the Commission approved PECO's Smart Meter Plan, the Company has focused most of its efforts on acquiring and installing the advanced metering infrastructure needed to provide smart meter technology to its customers. As more fully described in PECO Exhibit 1 (pp. 9-15), this effort has included installing and testing the core communications network using tower gateway base stations; system applications and network controllers; the MDMS and enterprise service bus ("Middleware"); and integrating the foregoing components into PECO's billing and "back office" systems.

12. As described by Mr. Innocenzo in PECO Statement No. 1, PECO used a well-designed and carefully-implemented information-gathering process to select its AMI Network vendor. Key AMI Network specifications were derived from Act 129's smart meter requirements. For example, as previously explained, Section 2807(f)(2) requires EDCs to furnish smart meters to customers upon request whether or not the installation of a smart meter at that customer's premises conforms to the EDC's scheduled meter deployment in that area. Of the two possible types of AMI Networks (commonly referred to as "mesh" and "point-to-point"), the Company decided to procure a "point-to-point" network, which can accommodate ad hoc requests for the installation of smart meters better and more cost effectively than a "mesh" system. PECO developed and issued a detailed Request for Proposal ("RFP") and, on the basis of the responses to its RFP, selected Sensus from among three finalists as the preferred vendor to provide a point-to-point AMI Network.

13. Although Sensus was selected to provide PECO's AMI Network, PECO considered and examined the meters offered by multiple suppliers (i.e., Sensus, Landis+Gyr

("L+G"), Elster Solutions, LLC, and General Electric) in order to reduce the risk of relying on a single supplier and to identify meters that would be compatible with the Sensus AMI System while meeting the functionality requirements imposed by Act 129, the Implementation Order, and the Company. After this examination was completed, PECO decided to obtain its first 600,000 smart meters from two suppliers (Sensus and L+G). However, as explained by Mr. Innocenzo (PECO Statement No. 1), the supply mix for smart meter procurement has changed because of the meter events discussed below.

14. The underlying technologies (AMI System, Communications Network, and IT Systems) were analyzed to ensure they could be successfully integrated and would perform properly. This was done through a sequence of acceptance procedures of escalating rigor in both urban and suburban environments. These efforts focused on ensuring the functionality of installation tools, deployment processes, system interfaces, billing procedures and meter accuracy. Although implementation and functional trials of these technologies were successful, several of these systems will continue to be modified, upgraded or enhanced as Phase One and Phase Two progress to completion.

15. PECO began testing smart meters for functionality at its Berwyn Meter Shop in September 2010. The Berwyn site includes an indoor laboratory for shop testing, first article testing and accuracy testing and an outdoor space for functional testing of the capabilities required by Act 129 (e.g., remote connection and disconnection). In mid to late 2011, PECO expanded its accuracy and functionality testing by deploying a limited number of meters (150) in both suburban and urban test environments. From December 2011 through February of 2012,

PECO installed 1,800 meters on customer and employee premises in order to test the installation and billing processes, network performance and customer acceptance.²

16. Once the AMI system was in place and successfully operated, PECO began to deploy smart meters to customers. In March of 2012, the Company began the full rate of smart meter installation. As the full deployment was underway, however, PECO experienced several meter events involving overheating that raised safety concerns. In response, PECO suspended the installation of smart meters to additional customers while those problems were investigated. As described by Mr. Innocenzo, PECO also initiated corrective actions, including the replacement of all installed Sensus smart meters with L+G meters.

17. As of this filing, PECO has completed the change-out of Sensus meters with L+G meters. On November 19, 2012, PECO resumed full deployment, this time with L+G meters, to customers beyond those that had previously received Sensus meters. As of the date of this filing, PECO has installed more than 300,000 smart meters at customers' premises.

18. Notably, the estimated costs of PECO's Smart Meter Plan, as presented to the Commission in the Company's 2009 filing, have proven to be reasonably accurate. Indeed, as shown on Appendix A to PECO Exhibit 1, PECO projects that its Phase One investment in smart meter technology, including both the underlying infrastructure and the 600,000 smart meters, will approximate \$313 million, or slightly higher than the upper range of estimated costs set forth in the Smart Meter Plan.

19. Consistent with its initial Smart Meter Plan, PECO has also utilized Phase One to develop and begin to implement a dynamic pricing and customer acceptance plan. Thus, on

² In addition to the testing summarized above, PECO participated in a "Performance Evaluation of Integral Disconnect Switches for Single-Phase Revenue Meters" hosted by the National Electric Energy Testing Research and Applications Center ("NEETRAC") in May 2010. This testing is described in Section 3.1 of the Universal Deployment Plan.

October 28, 2010, PECO filed a proposed dynamic pricing pilot program, which was reviewed by the Commission and approved by its Order entered April 15, 2011. *Petition of PECO Energy Company for Approval of its Initial Dynamic Pricing and Customer Acceptance Plan*, Docket No. M-2009-2123944. Thereafter, on April 2, 2012, the Company submitted a supplement to its dynamic pricing plan in which it proposed to use the services of an electric generation supplier (“EGS”) to satisfy its Act 129 requirement to provide time-of-use (“TOU”) rates to customers that had been provided smart meters. *See Petition of PECO Energy Company for Expedited Approval of its Dynamic Pricing Plan Vendor Selection and Dynamic Pricing Plan Supplement*, Docket No. P-2012-2297304.³ The Commission approved PECO’s revised dynamic pricing plan on September 13, 2012 with certain modifications. *See Opinion and Order, Petition of PECO Energy Company for Expedited Approval of its Dynamic Pricing Plan Vendor Selection and Dynamic Pricing Plan Supplement*, Docket No. P-2012-2297304 (Order entered September 26, 2012). PECO is currently working with its selected EGS on implementation planning for its TOU service pursuant to its Commission-approved pilot program.

20. PECO has also begun to systematically assess the security of its smart meter network to ensure the privacy of the data flowing through it. As Mr. Innocenzo explains, PECO has implemented a layered cyber security strategy, incorporating physical, platform network, application and process controls. Although PECO is confident that any privacy concerns have been adequately addressed in the design and construction of its smart meter infrastructure, several issues have surfaced that warrant further investigation and, in the attached Universal

³ PECO made its April 2, 2012 filing in response to the Commission’s recommendation that “EDCs contemplate contracting with an EGS in order to satisfy their [Act 129] TOU requirement.” *See Investigation of Pennsylvania’s Retail Electricity Market*, Docket No. I-2011-2237952 (December 16, 2011) (Order at 47).

Deployment Plan, the Company recommends that the Commission initiate a statewide proceeding to examine such issues (PECO Exhibit 1, pp. 27-29).

21. Finally, in accordance with the Commission's May 6, 2010 Order approving the Smart Meter Settlement, PECO has actively engaged interested parties in a collaborative process to keep stakeholders informed of the Company's progress in implementing Phase One of its Plan and to establish a dialogue to address and resolve issues regarding next steps. In fact, and as detailed in Appendix B of PECO Exhibit 1, PECO has convened fourteen collaborative meetings with stakeholders and, in addition, has held seven separate PUC briefings.

22. In summary, notwithstanding PECO's decision to temporarily suspend the deployment of smart meters and to replace Sensus meters that had already been installed, PECO has completed, or is on schedule to complete, all of the specific tasks designated for Phase One of its Smart Meter Plan. As a consequence, PECO is now positioned to proceed with Phase Two of its Plan, which involves the full-scale deployment of smart meters.

III. PHASE TWO OF PECO'S SMART METER PLAN

23. In Phase Two, PECO will procure and install approximately 1.2 million smart meters between the third quarter of 2013 and the end of 2014 (*see* PECO Statement No. 1). PECO will also continue to expand and upgrade its existing IT infrastructure to provide the necessary capacity to serve the additional demand (PECO Exhibit 1, pp. 20-21). Based on a comprehensive analysis of costs and benefits (*see* PECO Statement No. 2 and PECO Exhibit MJT-1), PECO has determined that customers will obtain a net benefit from moving forward expeditiously with smart meter deployment and, therefore, proposes to substantially complete the universal deployment of smart meters by the end of 2014. Moreover, in addition to the net benefits that have been quantified in PECO's cost-benefit analysis, advancing the deployment of

smart meters will enable customers to realize the benefits envisioned by Act 129 well before the implementation deadlines mandated by Act 129 and the Implementation Order. Although PECO is confident that it will be able to accommodate individual customer requests for smart meters during this period (i.e., from the first quarter of 2013 through 2014), it is seeking the Commission's approval to petition for a waiver of this requirement in the event that such requests reach a level that would negatively impact the synergies associated with the Company's accelerated deployment schedule (PECO Exhibit 1, pp. 29-30)⁴.

24. As previously noted, PECO's Universal Deployment Plan is designed to complete the installation of smart meters for substantially all customers by the end of 2014 because doing so will provide net benefits to customers as compared to the ten-year deployment plan envisioned in PECO's initial Smart Meter Plan. In order to analyze the merits of each approach, the Company compared the costs and benefits of deploying substantially all smart meters proportionately over a ten-year period ending in 2019 to the costs and benefits of deploying substantially all smart meters by the end of 2014. The results of PECO's cost-benefit comparison are set forth in PECO Exhibit MJT-1 and discussed in PECO Statement No. 2. That analysis shows that completing deployment by the end of 2014 will provide a net present value benefit to customers relative to the 2019 deployment scenario of approximately \$58 million when costs and benefits are discounted to 2012. The single largest benefit from early deployment is to enable PECO to cease paying fees to Landis+Gyr for services that company is providing to operate PECO's existing AMR system. The second largest benefit is derived from the lower costs PECO will incur to acquire and install smart meters under the shorter deployment schedule, which will enable PECO to achieve economies of scale in meter procurement, avoid

⁴ Depending on the circumstances, it can be extremely inefficient and create logistical challenges to have to execute an otherwise unscheduled smart meter installation.

future inflation-related increases in the price of meters and capture synergies in the installation of meters generated by a more compressed implementation schedule. The third largest benefit is the greater operational savings PECO will achieve by early deployment of smart meters. In addition to these three major sources of savings, further savings will be achieved in the IT area from shortening the implementation schedule, and greater customer/societal benefits will be achieved from advancing the date when customers can begin to take advantage of smart meter functionality. The elements of the cost-benefit comparison are discussed in greater detail in PECO Statement Nos. 1 and 2.

25. Pursuant to the Commission's Phase One Orders, PECO implemented a Smart Meter Cost Recovery Surcharge ("SMCRS") effective January 1, 2011.⁵ The Company proposes to continue recovering its smart meter costs through the SMCRS and, in accordance with the Smart Meter Settlement, amortizing its unrecovered investment in prematurely retired AMR meters ratably through the year 2020. As explained by Mr. Cohn, PECO's Universal Deployment Plan requires that PECO include two additional elements of revenue requirement in the SMCRS in order to recover fully its investment in existing AMR meters that are being retired and replaced with smart meters. First, PECO must include approximately \$9.8 million in additional depreciation that PECO will record on its books of account in excess of the annual accruals for depreciation associated with PECO's investment in AMR meters that it is recovering in its base rates. Second, PECO must include additional Pennsylvania Corporate Net Income Tax expense in the SMCRS to properly adjust for differences in book-tax timing caused by the early retirement of AMR meters. This additional state income tax liability adds approximately \$900,000 of tax expense to the SMCRS, which, when "grossed-up" for federal and state income

⁵ The SMCRS includes a 10% return on equity as approved by the Commission in PECO's last base rate proceeding (Docket No. R-2010-2161575).

taxes and gross receipts tax, translates to approximately \$1.7 million in increased revenue requirement. These two additional elements total \$11.5 million or an approximate \$1.1 million annual increase in the SMCRS.

26. As set forth in Appendix D to PECO Exhibit 1, PECO projects that smart meter cost recovery will increase an average residential customer's total electric bill from approximately \$1.40 (1.5%) in 2012 to \$2.60 (3.2%) by 2014. After peaking in 2014, the surcharge will decline steadily each year.

IV. COST RECOVERY FOR METER EVENT MITIGATION

27. As discussed by Mr. Innocenzo in PECO Statement No. 1, PECO is deferring certain meter costs associated with the meter events and the subsequent decision to replace Sensus meters during Phase One while it works to resolve issues related to cost recovery with its meter vendor. When a resolution acceptable to PECO has been achieved, PECO will seek Commission approval to fully recover any remaining deferred costs through its currently authorized SMCRS. In any event, PECO will not seek a return on the deferred meter event costs.

V. PROPOSED REVIEW SCHEDULE

28. In order to substantially achieve universal deployment of smart meters by the end of 2014 as proposed in PECO's Universal Deployment Plan, PECO proposes the following schedule for this proceeding:

January 18, 2013	Filing of the Plan
February 26, 2013	Intervention deadline
March 5, 2013	Prehearing Conference
April 26, 2013	Other Parties' Direct Testimony Due
May 16, 2013	Rebuttal Testimony Due
May 24, 2013	Surrebuttal Testimony Due
June 4-5, 2013	Evidentiary Hearings
June 26, 2013	Main Briefs
July 10, 2013	Reply Briefs
August 14, 2013	Initial Decision
October 17, 2013	Commission Order

VI. NOTICE

29. PECO will provide its customers with a bill insert related to this filing which will refer to PECO's website (www.peco.com/technology), where a copy of the entire filing will be maintained.

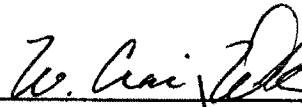
30. In addition to the above notice, PECO is serving copies of this filing on the Pennsylvania Office of Consumer Advocate, the Pennsylvania Office of Small Business Advocate, the Commission's Bureau of Investigation and Enforcement, and other parties to the Company's prior Smart Meter Plan proceeding.

31. PECO respectfully requests the Commission publish notice of this filing in the *Pennsylvania Bulletin*, with the above proposed deadline of February 26, 2013, as a deadline for intervention in this proceeding in light of PECO's proposed review schedule. Should the Commission conclude that further notice of this filing is appropriate, PECO will provide such additional notice as directed by the Commission.

VII. CONCLUSION

Based on the foregoing, including the accompanying testimony and exhibits, PECO respectfully requests that the Commission grant this Petition and enter an Order: (1) approving Phase Two of the Company's Smart Meter Plan, as set forth in PECO Exhibit 1 hereto; (2) approving PECO's proposed procurement and deployment of approximately 1.2 million additional smart meters to be substantially installed by the end of 2014; and (3) authorizing PECO to continue to recover its smart meter costs in accordance with the terms and conditions of its Smart Meter Cost Recovery Surcharge, including accelerated depreciation costs PECO will incur for existing AMR meters and incremental meter costs associated with PECO's revised supply mix.

Respectfully submitted,



Romulo L. Diaz, Jr., Esquire (Pa. No. 88795)
Anthony E. Gay, Esquire (Pa. No. 74624)
W. Craig Williams, Esquire (Pa No. 306405)
PECO Energy Company
2301 Market Street
P.O. Box 8699
Philadelphia, PA 19101-8699
Phone: 215.841.6857 Fax: 215.568.3389
E-mail: Romulo.Diaz@Exeloncorp.com

Thomas P. Gadsden, Esquire (Pa. No. 28478)
Anthony C. DeCusatis, Esquire (Pa. No. 25700)
Morgan, Lewis & Bockius LLP
1701 Market Street
Philadelphia, PA 19103-2921
Phone: 215.963.5234 Fax: 215.963.5001
E-mail: tgadsden@morganlewis.com

Dated: January 18, 2013

Counsel For PECO Energy Company

PECO Statement No. 1

Direct Testimony Of Michael Innocenzo

**PECO ENERGY COMPANY
STATEMENT NO. 1**

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY
FOR APPROVAL OF ITS
SMART METER UNIVERSAL DEPLOYMENT PLAN

DOCKET NO. M-2009-2123944

DIRECT TESTIMONY

WITNESS: MICHAEL INNOCENZO

SUBJECT: ACT 129 SMART METER
REQUIREMENTS, COMPONENTS OF
PECO'S SMART METER PROJECT, PHASE
ONE IMPLEMENTATION, UNIVERSAL
DEPLOYMENT PLAN, CYBER SECURITY
AND DATA PRIVACY, DEFERRAL OF
STRANDED METER COSTS

DATED: January 18, 2013

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1 Delaware and Chester County regions, as well as Regional Engineering Manager for
2 Delaware and Chester Counties. In addition, I was the Emergency Services
3 Supervisor in Philadelphia Region and a Project Engineer in the Philadelphia and
4 Montgomery County Divisions. I received a bachelor's degree in electrical
5 engineering from Widener University and a master's of business administration from
6 Villanova University.

7 **5. Q. Have you testified previously before this Commission or other regulatory or**
8 **legislative bodies?**

9 A. Yes, on October 12, 2011, I testified before the Commission as part of its Special
10 Electric Reliability Forum on Hurricane Irene. I also provided testimony to the
11 Senate Veterans Affairs and Emergency Preparedness and Consumer Protection and
12 Professional Licensure Committees regarding the same hurricane. In addition, on
13 September 13, 2012, I testified before the Commission during an informal,
14 informational hearing about meter overheating incidents relating to PECO's advanced
15 metering infrastructure ("AMI") deployment.

16 **6. Q. What is the purpose of your testimony?**

17 A. The purpose of my testimony is to provide an overview of the second phase ("Phase
18 Two") of PECO's Smart Meter Technology Procurement and Installation Plan (the
19 "Smart Meter Plan" or "Plan") and is divided into five parts. First, I describe PECO's
20 smart meter obligations under Act 129 of 2008 ("Act 129" or the "Act"). Second, I
21 discuss the key components of the Company's proposed smart meter project. Third, I
22 summarize the mitigation actions taken by PECO during "Phase One" of the Smart

1 Meter Plan. Fourth, I describe the Company’s proposed Smart Meter Universal
2 Deployment Plan (“Universal Deployment Plan”). Finally, I discuss PECO’s plans to
3 address cyber security, data privacy and meter incident cost recovery issues.

4 **II. OVERVIEW OF ACT 129 SMART METER REQUIREMENTS**

5 **7. Q. Please describe Act 129’s smart meter requirements.**

6 A. Act 129 directed electric distribution companies (“EDCs”) to file with the
7 Commission, by August 14, 2009, a smart meter technology procurement and
8 installation plan. 66 Pa.C.S. § 2807(f). Each EDC smart meter plan was to describe
9 the smart meter technologies the EDC proposed to install in accordance with a
10 depreciation schedule not to exceed 15 years and in response to customer requests
11 and new construction. *Id.* The Act also required EDCs to make available to third
12 parties direct meter access and electronic access to meter data, upon customer
13 consent, and to offer a time-of-use (“TOU”) rate and real-time price plan to
14 customers. *Id.* Additionally, the Act defined minimum smart meter technology
15 capabilities and provided a mechanism for EDCs to fully recover all of their prudent
16 and reasonable costs. 66 Pa.C.S. §§ 2807(f), (g).

17 In June 2009, the Commission issued an Implementation Order: (1) detailing plan
18 filing requirements, including key milestones to be addressed; (2) establishing a 30-
19 month grace period following plan approval for the installation of a smart meter
20 network; (3) describing the Commission’s expectations for smart meter capabilities;
21 and (4) providing guidance on how EDCs may recover their smart meter program

1 costs. *See Smart Meter Procurement and Installation*, Implementation Order, Docket
2 No. M-2009-2092655 (Order entered June 24, 2009) (“*Implementation Order*”).

3 **8. Q. Did PECO submit a smart meter plan in accordance with Act 129?**

4 A. Yes. On August 14, 2009, the Company filed a Petition for approval of its proposed
5 Smart Meter Plan. Various parties intervened in the ensuing proceeding and filed
6 testimony addressing elements of the Smart Meter Plan. On November 25, 2009, a
7 Joint Petition for Partial Settlement was filed that resolved all issues in the proceeding
8 except for the allocation and recovery of smart meter costs, which issues were
9 reserved for the Commission to decide. Under the terms of the Joint Petition for
10 Partial Settlement, PECO made a number of commitments, including: (1) a
11 commitment to address customer research and education on smart meters in a
12 separate filing; and (2) a commitment to conduct a series of stakeholder collaborative
13 meetings to obtain input from interested parties on significant elements of smart
14 meter procurement and implementation. By its Order entered on May 6, 2010, the
15 Commission approved the final Smart Meter Plan and decided outstanding issues not
16 resolved by the settlement. *See Petition of PECO Energy Company for Approval of*
17 *its Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-
18 2123944.

19 **9. Q. Did the Company make a separate filing addressing customer research and**
20 **education?**

21 A. Yes. The Company filed its proposed Dynamic Pricing and Customer Acceptance
22 Plan (the “Dynamic Pricing Plan”) on October 28, 2010, which described plans to

1 offer TOU rates as required by Act 129 and to test customer acceptance of those rates.
2 *See Petition of PECO Energy Company for Approval of its Initial Dynamic Pricing*
3 *and Customer Acceptance Plan*, Docket No. M-2009-2123944. The Commission
4 approved PECO's final Plan by Order entered April 15, 2011. In response to a
5 Commission Order recommending that EDCs utilize an electric generation supplier
6 ("EGS") to satisfy their TOU requirement¹, PECO filed a supplement to its Dynamic
7 Pricing Plan on April 2, 2012. *See Petition of PECO Energy Company for Expedited*
8 *Approval of its Dynamic Pricing Plan Vendor Selection and Dynamic Pricing Plan*
9 *Supplement*, Docket No. P-2012-2297304. On September 13, 2012, the Commission
10 approved the revised Dynamic Pricing Plan with certain modifications. PECO is
11 currently working with its selected EGS on implementation planning for its TOU
12 service pursuant to its Commission-approved pilot program.

13 **10. Q. Did PECO take any steps to mitigate the cost of its Smart Meter Plan?**

14 A. Yes, it did. Concomitant with its filing for Commission approval of its proposed
15 Smart Meter Plan, PECO also applied for, and was awarded, a \$200 million Smart
16 Grid Investment Grant ("SGIG") from the Department of Energy ("DOE") under the
17 American Recovery and Reinvestment Act of 2009. Of the total \$200 million grant,
18 approximately \$140 million was designed to offset PECO's initial smart meter
19 deployment costs. More specifically, in its approved Smart Meter Plan, the Company
20 committed to use that component of its SGIG funding to: (1) expand from 100,000 to
21 600,000 the number of smart meters it would install during the initial phase of

¹ See Investigation of Pennsylvania's Retail Electricity Market: Recommendations Regarding Upcoming Default Service Plans, Docket No. I-2011-2237952 (Order entered December 16, 2011), p. 47.

1 deployment; and (2) complete the universal deployment of smart meters within ten
2 years of Plan approval, or five years sooner than Act 129 requires. In addition, by
3 accepting SGIG program funds, PECO is obligated to install 600,000 smart meters by
4 the DOE-specified milestone date (i.e., April 2014).

5 **11. Q. Please briefly describe the components of PECO's approved Smart Meter Plan.**

6 A. As I will discuss in greater detail in Sections III and IV below, the Plan outlines a
7 two-phase strategy for deploying smart meter technology throughout PECO's service
8 territory in accordance with the requirements of Act 129. Phase One comprises the
9 selection, testing and validation of the smart meter technology to be deployed; the
10 deployment of the advanced metering infrastructure communication network; the
11 initial deployment of 600,000 smart meters; and the development of a program to
12 educate customers and implement initial dynamic pricing options. Phase Two will
13 substantially complete the deployment of smart meters across PECO's service
14 territory.

15 **III. COMPONENTS OF PECO'S SMART METER PROJECT**

16 **12. Q. Please describe the major components of PECO's smart meter project.**

17 A. The major components of the project fall into five categories: (1) the AMI System;
18 (2) the Communications Network; (3) the Information Technology ("IT") Systems;
19 (4) the smart meters themselves; and (5) the Web Presentment Platform.

1 **The AMI System**

2 The **AMI Host** is the master controller for the AMI System. It is responsible for
3 managing all communications and meter readings. It is also responsible for ensuring
4 that the system is secure and data are successfully transmitted to and from the smart
5 meters.

6 The **AMI Network** is the communications infrastructure that transports meter
7 readings, data, and commands between the meters and the AMI Host. The
8 communications capabilities provided by this network will be bi-directional all the
9 way to the meter and to the premises, which is not possible within PECO’s existing
10 Automated Meter Reading (“AMR”) system.

11 **The Communications Network**

12 The **Communications Network** is comprised of: (1) the Core Foundation Network,
13 which is a higher capacity transport system from the AMI Network to the AMI Host;
14 and (2) additional communications solutions that bridge the AMI Network and the
15 Core Foundation network when necessary.

16 **The IT Systems**

17 The **Meter Data Management System (“MDMS”)** is responsible for processing and
18 storing meter information, interval data, and events, and analyzing raw meter data. It
19 provides interfaces to other applications that require meter-related data. The MDMS
20 is also responsible for a process commonly called “VEE” – Validating, Editing and

1 Estimating – which is used to ensure that billing-quality meter data are delivered to
2 the billing system.

3 **Middleware** is a set of standard software components that manage the integration of
4 the AMI Host with the MDMS and the integration of the MDMS with the “Back
5 Office” Systems.

6 **System Integration** is comprised of the professional services for analyzing,
7 designing, building, testing and deploying each phase of the process of integrating the
8 AMI Host, MDMS, Middleware and IT Back Office Systems.

9 **The Smart Meters**

10 **Smart meters** are the physical smart meter end points that are used to record and
11 store interval usage data and events and communicate that information to the AMI
12 Network. PECO’s smart meters have the technological capabilities required by Act
13 129 and the *Implementation Order*, including bi-directional communication and direct
14 access to, and use of, price and consumption information.

15 **Web Presentment Platform**

16 The **Web Presentment Platform** enables customers to directly access their
17 consumption and pricing data. The web presentment solution will also enable the
18 “Green Button” initiative which will allow customers to securely download their own
19 easy-to-understand energy usage information when it is implemented.

20

1 **IV. PHASE ONE OF PECO’S SMART METER PLAN**

2 **13. Q. What actions did the Company take to implement Phase One of the Smart Meter**
3 **Plan?**

4 A. PECO has accomplished a variety of Phase One milestones, including: (1) selecting a
5 vendor for, and procuring, each of the smart meter project components described
6 above; (2) testing those components; (3) deploying the AMI System,
7 Communications Network, and IT Systems throughout the service territory before the
8 end of the Commission’s grace period; and (4) beginning the initial deployment of the
9 smart meter project by installing over 300,000 smart meters as of the date of this
10 filing.

11 **14. Q. Is there anything you would like to highlight regarding vendor selection?**

12 A. Yes. While a thorough discussion is provided in Section 3 of the Universal
13 Deployment Plan, I would like to briefly address vendor selection and procurement
14 for the AMI Network and smart meters.

15 PECO engaged in a careful and thorough process to select its AMI Network vendor.
16 After an exhaustive information gathering effort, including a series of workshops with
17 AMI vendors, PECO implemented a detailed Request for Proposals (“RFP”) and
18 evaluated participating vendors using a variety of technical, commercial, risk and
19 financial health criteria. Many of the technical criteria were driven by Act 129
20 requirements. For example, Act 129 requires EDCs to furnish smart meters to
21 customers at their request, regardless of whether that request is in accordance with the
22 EDC’s meter deployment schedule. Of the two possible types of AMI Networks

1 (mesh and point-to-point), the Company decided to procure and install a point-to-
2 point network that can better accommodate ad hoc requests for the installation of
3 smart meters. After considering three finalists from the RFP process, Sensus was
4 selected as the preferred vendor to provide a point-to-point AMI Network, with the
5 ability to accommodate individual customer requests for smart meters prior to full-
6 scale deployment in their areas.

7 **15. Q. How were the smart meters procured?**

8 A. Although Sensus was selected as PECO's AMI network vendor, PECO adopted a
9 policy of trying to obtain more than one source of metering technology in order to
10 mitigate possible supply risks. Consistent with this procurement strategy, PECO
11 tested four different suppliers' meters (Sensus, Landis+Gyr ("L+G"), Elster
12 Solutions, LLC, and General Electric) to identify meters that would be compatible
13 with the Sensus AMI System and that could meet the functionality requirements of
14 Act 129 and the *Implementation Order*. After this testing was completed, PECO
15 decided to obtain its first 600,000 smart meters from two sources, namely, Sensus and
16 L+G. However, the sourcing of smart meters has since changed because of the meter
17 events described below and in Section 3.1.1 of the Universal Deployment Plan.

18 **16. Q. How did PECO test the components of the smart meter project?**

19 A. The underlying technologies (AMI System, Communications Network, and IT
20 Systems) were tested to ensure they could be successfully integrated and that they
21 exhibited appropriate performance characteristics. This was done through a sequence
22 of acceptance tests of escalating rigor conducted in both urban and suburban test

1 environments. These tests focused on ensuring the functionality of installation tools,
2 deployment processes, system interfaces, billing procedures and meter accuracy.
3 Although implementation and testing of these technologies was successful, it is
4 important to note that several of these systems will continue to be modified, upgraded
5 or enhanced as Phase One and Phase Two progress to completion.

6 PECO began testing smart meters at its Berwyn Meter Shop in September 2010. The
7 Berwyn site includes an indoor laboratory for shop testing, first article testing and
8 accuracy testing and an outdoor space for functional testing of the capabilities
9 required by Act 129 (e.g., remote connection and disconnection). In mid to late 2011,
10 PECO expanded its accuracy and functionality testing by deploying a limited number
11 of meters (150) in controlled suburban and urban test environments. This testing has
12 shown that the Company's network and meter capabilities are meeting Act 129's
13 functional requirements. Finally, from December 2011 through February 2012,
14 PECO installed an additional 1,800 meters on customer and employee premises in
15 order to test installation and billing processes, network performance and customer
16 acceptance. In addition, PECO participated in a "Performance Evaluation of Integral
17 Disconnect Switches for Single-Phase Revenue Meters" hosted by the National
18 Electric Energy Testing Research and Applications Center ("NEETRAC") in May
19 2010. This testing is described in Section 3.1.2 of the Universal Deployment Plan.
20 PECO is in the early stages of testing its Web Presentment Platform.

1 17. Q. What did PECO do after successfully testing the underlying technologies and
2 smart meters?

3 A. In March of 2012, the Company began to install smart meters in greater numbers. As
4 the number of deployed meters increased in the spring and early summer of 2012,
5 however, PECO experienced a number of meter events that began to raise safety
6 concerns.

7 18. Q. What actions did the Company take in response to these meter events?

8 A. Because customer and employee safety is a top priority for PECO, among other
9 things, the Company temporarily suspended the installation of smart meters to
10 additional customers and initiated testing by respected independent testing
11 laboratories of vendors' meters as part of its efforts to identify the cause(s) of the
12 meter events and to assure the safety of the meters it would install in the future. In
13 that regard, PECO retained Underwriters' Laboratory ("UL") to test L+G meters and,
14 based on that testing, UL concluded that L+G meters were safe for consumer use.
15 Ultimately, the Company decided to replace all installed Sensus meters with L+G
16 meters. PECO resumed the installation of smart meters to new customers as of
17 November 19, 2012, using L+G meters. Even though Sensus meters are not currently
18 being installed, Sensus remains a potential meter supplier subject to PECO's
19 independent testing requirements for any meter product.

20

1 19. Q. Given the meter events you have described and PECO's response to those
2 events, when does PECO now project that the Phase One deployment will be
3 completed?

4 A. As of this filing, PECO has installed over 300,000 smart meters at customer premises.
5 Notwithstanding the meter events that resulted in the temporary suspension of
6 deployment and the replacement of existing Sensus smart meters, PECO expects to
7 complete the installation of 600,000 smart meters by June 2013.

8 20. Q. Finally, have stakeholders been involved in the Phase One implementation?

9 A. Yes. Consistent with PECO's practice and its commitments in the Settlement of its
10 Phase One proceeding, the Company has managed a productive and robust
11 stakeholder collaborative process. To date, PECO has held fourteen collaborative
12 meetings with stakeholders to review the overall progress of the Smart Meter Plan,
13 discuss key issues, and share next steps. Appendix B to the Universal Deployment
14 Plan provides additional detail on each collaborative meeting.

15 V. UNIVERSAL DEPLOYMENT

16 21. Q. In its original Smart Meter Plan, PECO proposed to complete the universal
17 deployment of smart meters within ten years of the Commission's approval of
18 the plan. Is the Company proposing any changes to that deployment timeframe?

19 A. Yes. PECO is proposing to substantially complete the deployment of smart meters
20 across its entire service territory by the end of 2014. To accomplish this acceleration,

1 the Company will procure and install approximately 1.2 million smart meters between
2 the second quarter of 2013 and the end of 2014.

3 **22. Q. Why is the Company proposing to accelerate its universal deployment of smart**
4 **meters?**

5 A. The Company compared the costs and benefits of: (1) deploying substantially all
6 smart meters more or less proportionately over a ten-year deployment plan ending in
7 2019, as had been proposed for Phase Two in PECO's initial Smart Meter Plan; to (2)
8 the costs and benefits of deploying substantially all smart meters by the end of 2014.
9 The 2014 end date is significant to the cost-benefit analysis for reasons I will explain
10 later. The results of PECO's cost-benefit comparison are set forth in PECO Exhibit
11 MJT-1,² which is sponsored by Mr. Trzaska and explained in Mr. Trzaska's direct
12 testimony (PECO Statement No. 2). That analysis shows that deploying substantially
13 all smart meters by the end of 2014 will provide a net present value benefit to
14 customers vis-a-vis the 2019 deployment scenario of approximately \$58 million when
15 costs and benefits are discounted to 2012.

16 By way of background, it is important to note that, by the end of the grace period,
17 PECO had made substantially all of the investments in its AMI System,
18 Communications Network and IT Systems that are necessary to support smart meter
19 functions and, in fact, as I previously noted, over 300,000 smart meters are already in
20 place at customers' premises. Accordingly, the analysis of alternative Phase Two
21 deployment plans focused on the costs and benefits of installing approximately 1.2

² The cost-benefit analysis set forth in PECO Exhibit MJT-1 is also provided as Appendix C to the Universal Deployment Plan.

1 million smart meters at customers' premises sooner (by the end of 2014) rather than
2 later (by the end of 2019). Stated another way, over 50% of the investment for the
3 smart meter project will have been made by the end of Phase One, and the additional
4 investment, consisting largely of the smart meters themselves, is the last major
5 element of the project needed to bring fully functioning smart meter capabilities to all
6 of PECO's customers.

7 As shown on PECO Exhibit MJT-1, the single largest benefit to customers from early
8 deployment is to enable PECO to cease paying fees to L+G for services that company
9 is providing to operate PECO's existing AMR system. The second largest benefit is
10 derived from the lower costs PECO will incur to acquire and install smart meters
11 under the shorter deployment schedule. PECO will achieve economies of scale by
12 making larger bulk purchases of meters, as a shorter deployment schedule will
13 accommodate, and will avoid future increases in the unit price of meters that will
14 occur over the five additional years of a deployment plan ending in 2019.

15 Additionally, more rapid deployment will create synergies in the installation process,
16 which will also reduce costs. The third largest benefit is the greater operational
17 savings PECO will achieve by early deployment of smart meters. The elements of
18 these savings are discussed in greater detail by Mr. Trzaska. Finally, societal benefits
19 will be achieved, which are also discussed by Mr. Trzaska.

20 **23. Q. What additions to PECO's existing smart meter project are needed to support**
21 **accelerated universal deployment?**

1 A. The only notable addition is an accelerated build-up of existing IT infrastructure to
2 manage the expanded number of electric meter reads and the business integration
3 requirements. This build up would have occurred under the original deployment
4 scenario (though at a later time) and is not expected to have a significant impact on
5 total IT costs.

6 **24. Q. Is the Company confident that it will be able to replace all existing AMR meters**
7 **with smart meters by the end of 2014?**

8 A. PECO expects to be able to replace substantially all of its existing meters within that
9 timeframe. However, there no doubt will be a small number of “difficult-to-access”
10 meters that the Company will not be able to convert before the end of 2014. These
11 meters will be replaced with smart meters in an efficient and safe manner following
12 all current practices for acquiring access to those meter sites. In addition, some
13 existing commercial and industrial meters already have many of the required smart
14 meter capabilities but use a separate technology. These will be replaced with smart
15 meters after Phase Two is completed.

16 **25. Q. What notice will customers receive before their smart meters are installed?**

17 A. Consistent with the Company’s practice during Phase One, customers will receive
18 two letters and a telephone call beginning about six weeks prior to receiving a smart
19 meter. The general nature and content of these communications are discussed in
20 Section 6.1 of the Smart Meter Universal Deployment Plan (PECO Exhibit 1).

1 **26. Q. What information will customers receive about the functions their meter can**
2 **perform?**

3 A. A summary of the information PECO will furnish to customers about smart meter
4 functions is provided in Section 6.1 of the Smart Meter Universal Deployment Plan.

5 **27. Q. How will stakeholders be involved in universal deployment?**

6 A. PECO intends to continue the stakeholder collaborative meetings that were so
7 successful during Phase One. In fact, during the most recent meeting in October,
8 2012, the Company provided an overview of its proposed Universal Deployment
9 Plan.

10 **VI. CYBER SECURITY AND DATA PRIVACY**

11 **28. Q. What is cyber security as it relates to PECO's Smart Meter Plan?**

12 A. Cyber security encompasses the identification, implementation and management of
13 appropriate controls to ensure the confidentiality, integrity and availability of the
14 entire smart meter project.

15 **29. Q. What is the Company doing to protect its smart meter project?**

16 A. During Phase One, PECO performed an initial security assessment, which evaluated
17 the underlying smart meter infrastructure and controls (e.g., physical security of field
18 network elements and encryption ability). As a result of that initial assessment, and
19 in concert with the Company's cyber security plan under its DOE SGIG Program,
20 PECO has implemented a layered security strategy, incorporating physical, platform,

1 network, application and process controls. Company personnel have been trained in
2 incident management and event monitoring processes and PECO has implemented a
3 “Command Center” for smart meter operational support. Together, these controls
4 will allow the Company to mitigate, detect and remediate threats to the entire smart
5 meter infrastructure. However, the Company plans to continue performing security
6 assessments in order to evaluate existing security plans and identify improvements.
7 Additional detail on cyber security is provided in Section 6.2 of the Universal
8 Deployment Plan.

9 **30. Q. Has the Company addressed data privacy as part of its Smart Meter Plan?**

10 A. Yes, data privacy is a key concern for PECO and was a consideration in the design of
11 the Company’s entire smart meter project. First, no customer-identifying
12 information, such as customers’ addresses, will be stored in the smart meters or
13 communicated across the AMI Network. Second, the energy usage data collected by
14 smart meters will be encrypted and protected using the same methods as online
15 banking and ATM machines. Finally, collected data will be transmitted to PECO via
16 a secure network. As discussed above, the entire smart meter infrastructure is
17 protected by the Company’s layered cyber security strategy.

18 It is important to note that PECO has met with, and will continue to meet with,
19 interested stakeholders to discuss the safeguarding of smart meter data. Some of the
20 key issues under discussion include customer education regarding privacy rights,
21 customer consent procedures, and protecting victims of domestic violence and other
22 related crimes. If the Commission were to decide that a more formal process might

1 be called for, the Company suggests that the Commission consider initiating a
2 statewide proceeding to examine these and other issues surrounding smart meter data
3 security and privacy.

4 **VII. COST RECOVERY FOR METER EVENT MITIGATION**

5 **31. Q. Mr. Innocenzo, is PECO seeking to recover in this proceeding any costs that**
6 **were incurred as a result of the meter events described earlier in your testimony**
7 **and PECO's response to those events?**

8 A. PECO is not seeking to recover in this proceeding the costs it incurred to purchase
9 and install Sensus meters. To date, PECO has purchased approximately 320,000
10 Sensus meters and has incurred installation costs (including removal costs for existing
11 meters) for approximately 186,000 of those meters. PECO is deferring the foregoing
12 costs while it works to resolve issues related to cost responsibility with its meter
13 vendor. When a resolution acceptable to PECO has been achieved, PECO will seek
14 Commission approval to fully recover any remaining deferred costs through its
15 currently authorized Smart Meter Cost Recovery Surcharge. Any recovery by PECO
16 from its meter vendor and any reimbursement from the DOE will be credited against
17 the costs that PECO is deferring. In any event, PECO will not seek a return on the
18 deferred meter event costs.

19 **VIII. CONCLUSION**

20 **32. Q. Does this conclude your direct testimony?**

21 A. Yes.

PECO Statement No. 2

Direct Testimony Of Michael J. Trzaska

**PECO ENERGY COMPANY
STATEMENT NO. 2**

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY
FOR APPROVAL OF ITS
SMART METER UNIVERSAL DEPLOYMENT PLAN

DOCKET NO. M-2009-2123944

DIRECT TESTIMONY

WITNESS: MICHAEL J. TRZASKA

SUBJECT: COST-BENEFIT ANALYSIS OF
ACCELERATING UNIVERSAL
DEPLOYMENT

DATED: January 18, 2013

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1 **DIRECT TESTIMONY**
2 **OF**
3 **MICHAEL J. TRZASKA**

4 **I. INTRODUCTION AND PURPOSE OF TESTIMONY**

5 **1. Q. Please state your name and business address.**

6 A. My name is Michael J. Trzaska. My business address is PECO Energy Company,
7 2301 Market Street, Philadelphia, PA 19103.

8 **2. Q. By whom are you employed and in what capacity?**

9 A. I am employed by PECO Energy Company (“PECO” or the “Company”) as a
10 Principal Regulatory and Rates Specialist in the Regulatory Policy and Strategy
11 Department.

12 **3. Q. What are your duties and responsibilities in this position?**

13 A. I perform financial analysis, project management and regulatory strategy for electric
14 and gas activities throughout PECO’s operations and service territory.

15 **4. Q. Please describe your educational background and your professional experience.**

16 A. I received a Bachelor of Science Degree in Accounting from Drexel University in
17 1987 and a Masters in Business Administration in Finance from LaSalle University in
18 1994. I began working for PECO in June of 1987 and have been with the Company
19 for my entire career in various positions of increasing responsibility.

1 **5. Q. Have you testified previously before this Commission or other regulatory**
2 **bodies?**

3 A. Yes. I testified before the Pennsylvania Public Utility Commission (“Commission”)
4 in the proceedings for approval of PECO’s Smart Meter Cost Recovery Surcharge
5 (“SMCRS”) reconciliation for the twelve months ended June 30, 2011 and June 30,
6 2012 at Docket Nos. M-2011-2255303 and M-2012-2317811. Pursuant to Section
7 1307 of the Pennsylvania Public Utility Code, a public hearing is held to review the
8 annual reconciliation of costs and revenues under the SMCRS.

9 **6. Q. What is the purpose of your testimony?**

10 A. The purpose of my testimony is two-fold. First, I will describe PECO’s proposal to
11 accelerate the implementation of the second phase (“Phase Two”) of its Smart Meter
12 Plan to substantially complete the universal deployment of smart meters across its
13 entire service territory by the end of 2014, or approximately five years earlier than
14 previously anticipated. Second, I will describe the comprehensive cost-benefit
15 analysis that supports PECO’s proposed Smart Meter Universal Deployment Plan
16 (“Universal Deployment Plan”).

17 **7. Q. Are you sponsoring any exhibits?**

18 A. Yes. I am sponsoring PECO Exhibit MJT-1 (Estimated Cost-Benefit Analysis for
19 Phase Two Smart Meter Deployment), which I discuss later in my testimony.¹

¹ The Estimated Cost-Benefit Analysis for Phase Two Smart Meter Deployment presented in PECO Exhibit MJT-1 is identical to the cost-benefit analysis provided in Appendix C to the Universal Deployment Plan.

1 **II. OVERVIEW OF THE UNIVERSAL DEPLOYMENT PLAN**

2 **8. Q. Mr. Trzaska, please provide an overview of PECO’s proposed universal**
3 **deployment of smart meters during Phase Two of its Smart Meter Plan.**

4 A. Under the Smart Meter Plan that the Commission approved in its Order entered May
5 6, 2010 at Docket No. M-2009-2123944, PECO must complete the full-scale
6 deployment of smart meters across its service territory within ten years of plan
7 approval or by the end of 2019. Under the Universal Deployment Plan that PECO is
8 proposing, it would accelerate universal deployment by procuring and installing
9 approximately 1.2 million smart meters between the second quarter of 2013 and the
10 end of 2014.² However, PECO expects a small percentage of its existing meters will
11 be replaced with smart meters after the end of 2014 because those meters are difficult
12 to access, as Mr. Innocenzo explains in PECO Statement No. 1.

13 **9. Q. What universal deployment scenarios did PECO examine and what did that**
14 **examination reveal about the relative benefits of accelerating universal**
15 **deployment?**

16 A. PECO examined the proposed Universal Deployment Plan in comparison to a
17 deployment that would not conclude until 2019. That examination shows that
18 substantially completing the deployment of smart meters by the end of 2014 will
19 advance the delivery of several key benefits to PECO’s customers. First, PECO will
20 cease paying fees to Landis+Gyr for services that company is providing to operate
21 PECO’s existing AMR system and PECO’s customers will cease bearing that cost.

² PECO will have installed approximately 600,000 smart meters by June 2013.

1 Second, the accelerated deployment of smart meters will mitigate potential AMR
2 transition costs and communication system obsolescence associated with PECO's
3 aging AMR meters. Many of the existing AMR meters will reach the end of their
4 useful lives between 2014 and 2019. Consequently, without accelerated smart meter
5 deployment, PECO would have to incur the cost to replace those end-of-life AMR
6 meters twice – first with another AMR meter and, later, with a smart meter.

7 Third, PECO will incur lower costs to acquire and install smart meters under the
8 shorter deployment schedule. PECO will achieve economies of scale by making
9 larger bulk purchases of meters and will avoid future increases in the unit price of
10 meters that will occur over the five additional years of a deployment plan ending in
11 2019. Additionally, more rapid deployment will create synergies in the installation
12 process, which will also reduce costs. All of the foregoing economic benefits will
13 flow through to customers through the operation of the SMCRS.

14 From a societal standpoint, PECO's proposed Universal Deployment Plan advances
15 the access to advanced metering technology and opportunities for customers to
16 participate in energy efficiency and conservation programs and enables them to better
17 understand and manage their energy needs. Customers participating in these
18 programs will reduce their energy costs and promote overall environmental goals by
19 reducing their energy consumption.

20 Because of the foregoing benefits, PECO decided to further analyze the accelerated
21 deployment option by conducting a formal cost-benefit analysis and, if that analysis

1 showed net benefits from substantially completing universal deployment by 2014, to
2 develop and propose a Universal Deployment Plan based on that schedule.

3 **III. COST-BENEFIT ANALYSIS OF PECO'S PROPOSED UNIVERSAL**
4 **DEPLOYMENT PLAN**

5 **10. Q. Please describe the economic analysis PECO performed of alternative smart**
6 **meter deployment schedules.**

7 A. As previously noted, PECO prepared a comprehensive cost-benefit analysis of two
8 deployment scenarios, namely, substantially completing universal deployment by the
9 end of 2014 and substantially completing universal deployment by the end of 2019.
10 That analysis supports the substantial completion of universal deployment by the end
11 of 2014. As previously noted, the principal factors that weigh in favor of accelerating
12 smart meter deployment are the earlier termination of service fees for operating the
13 existing AMR system and lower implementation costs associated with rapid
14 deployment.

15 **11. Q. What is PECO's estimate of the total cost of Phase Two?**

16 A. As shown on Exhibit MJT-1 and Appendix C to the Universal Deployment Plan,
17 PECO estimates that the total cost to substantially complete Phase Two of the Plan by
18 the end of 2014 will be approximately \$282 million. In contrast, PECO estimates that
19 the total cost to substantially complete Phase Two by the end of 2019 will be
20 approximately \$297 million. The \$15 million cost savings benefit yielded by PECO's
21 proposed accelerated deployment is primarily driven by economies of scale, avoiding
22 future price increases for meter hardware and installation synergies.

1 **12. Q. Please describe the breakdown of the total Phase Two costs into the various**
2 **categories that PECO identified in its analysis.**

3 A. PECO divided its Phase Two Smart Meter Plan costs into three categories, as shown
4 in Exhibit MJT-1. The first cost category is AMI Deployment, which primarily
5 reflects the procurement and installation of approximately 1.2 million smart meters.
6 The estimated cost of approximately \$123 per meter is based on PECO's Phase One
7 vendor contracts and its contemplated mix of meters. The second category relates to
8 information technology ("IT") enablement costs and includes additional IT
9 infrastructure upgrades and key application enhancements for items such as providing
10 interval data settlement capabilities, expanding disaster recovery solutions and
11 upgrading the Meter Data Management System ("MDMS") to the next generation
12 offered by PECO's vendor (Oracle America, Inc.) for capacity, performance, and
13 continued vendor supportability. The third and final category is business integration,
14 which reflects costs that encompass customer integration activities and business
15 readiness requirements to support the management of the entire AMI system by
16 PECO rather than through an outsourcing arrangement.

17 **13. Q. Will the proposed accelerated deployment reduce the costs borne by customers?**

18 A. Yes. As I discussed previously, the single largest benefit to customers is the
19 significant reduction in costs that results from PECO ceasing paying fees to
20 Landis+Gyr to operate PECO's existing AMR system.

21 **14. Q. Mr. Trzaska, please describe the customer benefits that are expected from the**
22 **implementation of smart meter technology.**

1 A. As part of its initial Smart Meter Plan, PECO noted that it had already realized
2 significant benefits from installing its existing AMR system, including, most notably,
3 eliminating physical meter reading for nearly all of its electric customers. However,
4 additional operational and societal benefits have also been identified that PECO
5 expects to realize when smart meters are installed. Operational savings are primarily
6 related to the remote connection functionality that AMI technology will provide,
7 which will avoid connection costs and reduce uncollectible expense from delinquent
8 accounts.

9 In addition to operational benefits, the remote connection feature provides societal
10 benefits that include reducing energy consumption by remotely disconnecting hard-
11 to-reach meters that have continuous unbilled service and avoiding costly
12 reconnection charges. These societal benefits have associated economic savings that
13 flow through to customers in the form of lower reconnection fees or, in the case of
14 eliminating continuous unbilled service, lower purchased power costs.

15 **15. Q. Based on PECO's economic analysis, is the Universal Deployment Plan PECO is**
16 **proposing for Commission approval cost-effective?**

17 A. Yes. As shown on Exhibit MJT-1, completing universal deployment by the end of
18 2014 provides a significant net present value benefit to customers of approximately
19 \$58 million over the 2019 deployment scenario when costs and benefits are
20 discounted to 2012 using a seven percent discount rate.

21 **16. Q. How is the Company proposing to recover the cost of implementing its Universal**
22 **Deployment Plan from customers?**

1 PECO proposes to recover its Phase Two deployment costs through its existing
2 SMCRS. The SMCRS is the cost-recovery mechanism the Commission previously
3 approved for the Company's use in the final order entered in the Company's Phase
4 One Smart Meter Plan proceeding.

5 **17. Q. Has PECO updated its cost projections for both phases of the Smart Meter**
6 **Plan?**

7 A. Yes. PECO currently projects that the cost of the Phase One deployment will
8 approximate \$313 million, which is slightly higher than the upper end of the range of
9 original cost estimates set forth in PECO's Smart Meter Plan. Similarly, the
10 estimated cost to complete the universal deployment of smart meters in Phase Two is
11 \$282 million compared to the preliminary estimate of \$250 million. Appendix A to
12 the Universal Deployment Plan provides a summary of current cost projections
13 compared to the initial cost estimates set forth in the Smart Meter Plan.

14 **18. Q. Has PECO estimated the impact on customers of its proposed cost recovery for**
15 **the updated Phase One and Phase Two cost estimates?**

16 A. Yes. Appendix D to the Universal Deployment Plan provides the estimated SMCRS
17 rate broken down by year and customer class, net of funding at approximately 48% of
18 gross plant under PECO's Smart Grid Investment Grant from the Department of
19 Energy pursuant to the American Recovery and Reinvestment Act of 2009. As
20 shown on the table in Appendix D, PECO projects that smart meter cost recovery will
21 increase an average residential customer's total electric bill from approximately \$1.40

1 (1.5%) in 2012 to \$2.60 (3.2%) by 2014. After peaking in 2014, the surcharge will
2 decline steadily each year.

3 **IV. CONCLUSION**

4 **19. Q. Does this conclude your direct testimony?**

5 **A. Yes.**

Exhibit MJT-1

Estimated Cost-Benefit Analysis for Phase Two Smart Meter Deployment (\$M as of January 18, 2013)

Proposed Phase Two Plan - (Completion of Entire Service Territory by end of 2014)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Phase Two Costs:											
AMI Deployment		\$ (111.7)	\$ (130.6)	\$ (0.2)							\$ (242.4)
IT Enablement	\$ (0.4)	\$ (17.9)	\$ (15.6)	\$ (0.1)							\$ (34.0)
Business Integration	\$ (0.1)	\$ (3.3)	\$ (2.2)								\$ (5.7)
Total Phase Two Costs	\$ (0.6)	\$ (132.9)	\$ (148.3)	\$ (0.3)							\$ (282.1)
Benefits:											
Avoided AMR Fees	\$ 0.7	\$ 4.8	\$ 16.2	\$ 30.2	\$ 32.3	\$ 32.3	\$ 32.3	\$ 32.3	\$ 32.3	\$ 32.3	\$ 245.4
PECO Operational Savings		\$ 1.1	\$ 4.3	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 53.5
Customer (Societal) Benefits*		\$ 0.8	\$ 2.0	\$ 3.4	\$ 6.1	\$ 6.1	\$ 6.1	\$ 6.1	\$ 6.1	\$ 6.1	\$ 42.8
Total Benefits	\$ 0.7	\$ 6.8	\$ 22.4	\$ 40.5	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 341.8
Net (Cost) - Benefit	\$ 0.1	\$ (126.1)	\$ (125.9)	\$ 40.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 59.7
NPV_{7.0} of (Costs) - Benefits	\$ (17.7)										

Alternative Phase Two Plan - (Proportionate Completion of Entire Service Territory by end of 2019)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Phase Two Costs:											
AMI Deployment		\$ (27.7)	\$ (41.9)	\$ (40.4)	\$ (40.4)	\$ (40.4)	\$ (40.5)	\$ (21.4)			\$ (252.6)
IT Enablement	\$ (0.4)	\$ (9.4)	\$ (9.8)	\$ (17.1)	\$ (2.1)						\$ (38.9)
Business Integration	\$ (0.1)	\$ (3.3)	\$ (2.2)								\$ (5.7)
Total Phase Two Costs	\$ (0.6)	\$ (40.5)	\$ (53.9)	\$ (57.4)	\$ (42.5)	\$ (40.4)	\$ (40.5)	\$ (21.4)			\$ (297.1)
Benefits:											
Avoided AMR Fees	\$ 0.7	\$ 4.8	\$ 8.0	\$ 11.2	\$ 14.4	\$ 17.6	\$ 20.8	\$ 23.9	\$ 32.3	\$ 32.3	\$ 165.9
PECO Operational Savings		\$ 0.5	\$ 1.3	\$ 2.1	\$ 3.0	\$ 3.8	\$ 4.7	\$ 5.8	\$ 6.9	\$ 6.9	\$ 35.0
Customer (Societal) Benefits		\$ 0.3	\$ 1.0	\$ 1.8	\$ 2.6	\$ 3.4	\$ 4.2	\$ 5.2	\$ 6.1	\$ 6.1	\$ 30.7
Total Project Benefits	\$ 0.7	\$ 5.5	\$ 10.3	\$ 15.1	\$ 20.0	\$ 24.8	\$ 29.7	\$ 34.9	\$ 45.2	\$ 45.2	\$ 231.5
Net (Cost) - Benefit	\$ 0.1	\$ (34.9)	\$ (43.6)	\$ (42.3)	\$ (22.5)	\$ (15.7)	\$ (10.8)	\$ 13.6	\$ 45.2	\$ 45.2	\$ (65.6)
NPV_{7.0} of (Costs) - Benefits	\$ (75.9)										

* Societal benefits are not included in revenue requirement estimates shown in Appendix D.

PECO Statement No. 3

Direct Testimony Of Alan B. Cohn

**PECO ENERGY COMPANY
STATEMENT NO. 3**

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF PECO ENERGY COMPANY
FOR APPROVAL OF ITS
SMART METER UNIVERSAL DEPLOYMENT PLAN

DOCKET NO. M-2009-2123944

DIRECT TESTIMONY

WITNESS: ALAN B. COHN

SUBJECT: RATEMAKING TREATMENT OF
ACCELERATED DEPRECIATION OF
AUTOMATED METER READING
INVESTMENT

DATED: January 18, 2013

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**DIRECT TESTIMONY
OF
ALAN B. COHN**

5

I. INTRODUCTION AND PURPOSE OF TESTIMONY

6 **1. Q. Please state your full name and business address.**

7 A. My name is Alan B. Cohn. My business address is PECO Energy Company, 2301
8 Market Street, Philadelphia, Pennsylvania 19103.

9 **2. Q. By whom are you employed and in what capacity?**

10 A. I am employed by PECO Energy Company (“PECO” or the “Company”) as Manager
11 of Regulatory Strategy in the Regulatory Group.

12 **3. Q. Please describe your educational background.**

13 A. I received a Bachelor of Science Degree in Commerce and Engineering from Drexel
14 University in 1980. I received a Masters Degree in Business Administration from
15 Drexel in 1985. In addition, I have completed the American Gas Association
16 (“AGA”) Gas Rate Fundamentals Course at the University of Wisconsin and the
17 AGA Advanced Gas Rate Course at the University of Maryland.

18 **4. Q. Please describe your work experience in the energy industry.**

19 A. Upon graduation from college in 1980, I was hired by PECO as a Rate Analyst in the
20 Cost and Load Analysis Section of the Rate Division. In 1987, I was appointed
21 Supervisor of the Economic Analysis Section in PECO’s Rates and Regulatory
22 Affairs Division. Since that time, I have held various management positions in

1 PECO's Rates and Regulatory Affairs Department and Strategic Planning
2 Department, where I have responsibility for managing base rate case filings, cost-of-
3 service studies and financial and economic analyses.

4 **5. Q. Have you testified previously before this Commission or other regulatory or**
5 **legislative bodies?**

6 A. Yes. I have testified in regulatory proceedings before the Pennsylvania Public Utility
7 Commission (the "Commission"), the Federal Energy Regulatory Commission and
8 the Maryland Public Service Commission. A list of the cases in which I have
9 submitted testimony is attached as Exhibit ABC-1.

10 **6. Q. What is the purpose of your direct testimony?**

11 A. The purpose of my testimony is to describe the impact on revenue requirement
12 associated with depreciation and the Pennsylvania Corporate Net Income Tax ("state
13 income tax") that results from the Company's decision to complete the universal
14 deployment of smart meters by the end of 2014, instead of the end of 2019 as PECO
15 had proposed in its initial Smart Meter Plan. PECO's decision to accelerate the
16 universal deployment of smart meters is explained in the direct testimony of Mr.
17 Innocenzo (PECO Statement No. 1) and Mr. Trzaska (PECO Statement No. 2).

18 The Company's initial Smart Meter Plan was adopted pursuant to the Commission's
19 final Order entered May 6, 2010 approving a Joint Petition for Partial Settlement
20 ("Smart Meter Settlement") in the proceeding at Docket No. M-2009-2123944 that
21 was initiated to review the Company's Plan. As part of the Smart Meter Settlement,

1 the Commission approved the implementation of a Smart Meter Cost Recovery
2 Surcharge (“SMCRS”) and also approved the manner in which PECO would recover
3 its remaining investment in Automated Meter Reading (“AMR”) technology that is
4 being replaced by smart meters.

5 **II. REVENUE REQUIREMENT IMPACT --**
6 **DEPRECIATION AND STATE INCOME TAX**

7 **7. Q. Why was the recovery of PECO’s remaining investment in AMR meters**
8 **addressed in the Smart Meter Settlement?**

9 A. Pursuant to the requirements of Act 129 of 2008, PECO and other electric distribution
10 companies (“EDCs”) are required to purchase and install smart meters and the
11 associated infrastructure necessary to obtain the functionality required by the terms of
12 Act 129 and the Commission’s Order entered on June 24, 2009 at Docket No. M-
13 2009-2092655 (“Implementation Order”). The installation of smart meters
14 necessarily requires that PECO’s existing AMR meters be retired before PECO’s
15 investment in those meters has been fully recovered through the annual accruals for
16 depreciation reflected in PECO’s existing base rates.

17 **8. Q. How did the Smart Meter Settlement address the recovery of PECO’s**
18 **investment in AMR meters?**

19 A. Paragraph 14.F. (1) of the Smart Meter Settlement provides as follows:

20 **F. Recovery of PECO’s Automated Meter Reading**
21 **(“AMR”) Investment**

22 (1) PECO’s recovery of its AMR investment existing as
23 of January 1, 2011 and any subsequent necessary additional

1 investment shall be recovered in equal installments in the Smart
2 Meter surcharge [SMCRS] over a period ending December 31,
3 2020. In addition, any increase in annual depreciation resulting
4 from the Company's Smart Meter Plan approved by the
5 Commission that occurs prior to January 1, 2011 shall be deferred
6 and recovered with the net AMR investment balance at January 1,
7 2011. The unamortized amount shall be included in the rate base
8 component of the Smart Meter Surcharge.

9
10 Thus, the Smart Meter Settlement established a ten-year period (January 1, 2011
11 through December 31, 2020) for PECO to recover its AMR investment that remained
12 unrecovered as of January 1, 2011. It also provided that PECO would defer any
13 incrementally higher depreciation incurred in 2010 related to Smart Meter Plan
14 implementation and recover the incremental depreciation by adding it to PECO's
15 unrecovered AMR investment at January 1, 2011.

16 **9. Q. Why was a ten-year recovery period selected?**

17 A. The ten-year recovery period corresponded generally to the period within which
18 PECO had initially proposed to complete its deployment of smart meters throughout
19 its service territory.

20 **10. Q. In light of the Universal Deployment Plan PECO is proposing in this proceeding,**
21 **which would substantially complete the deployment of smart meters throughout**
22 **its service territory by the end of 2014, is PECO also proposing to accelerate the**
23 **period over which it will recover its remaining unrecovered investment in AMR**
24 **meters?**

25 A. No, it is not. PECO will adhere to the recovery period that was approved as part of
26 the Smart Meter Settlement. As a consequence, PECO will replace virtually all of its

1 existing AMR meters with smart meters by the end of 2014, but will recover its
2 investment in the retired AMR meters over a ten-year period ending December 31,
3 2020.

4 **11. Q. Have you prepared an exhibit showing the calculation of additional revenue**
5 **requirement associated with accelerating the depreciation of PECO's investment**
6 **in AMR meters?**

7 A. Yes, I have prepared PECO Exhibit ABC-2. This exhibit shows the development of
8 two additional elements of revenue requirement associated with the retirement of
9 PECO's AMR meters. First, it shows the calculation of additional depreciation
10 PECO must include in its SMCRS in order to recover fully its investment in AMR
11 meters that are being retired and replaced with smart meters. This amount is \$9.8
12 million, as shown in column 3 on the top half of Exhibit ABC-2. Second, it shows
13 the development of the revenue requirement associated with the additional state
14 income tax that must be included in the SMCRS to properly adjust for differences in
15 book-tax timing caused by the early retirement of AMR meters. The additional state
16 income tax is approximately \$900,000, which, when grossed-up for federal and state
17 income tax effects and gross receipts tax, imposes approximately \$1.7 million in
18 additional revenue requirement, as shown in columns 6 and 7, respectively, on the top
19 half of Exhibit ABC-2.

20

21

1 **12. Q. Please explain the derivation of the additional depreciation of \$9.8 million that**
2 **must be included in the SMCRS to recover PECO's investment in AMR meters.**

3 A. All of my references in this answer are on the spreadsheet displayed on the top half of
4 Exhibit ABC-2.¹ Column 1 shows, for the year 2010, the increase in annual
5 depreciation that the Company incurred prior to January 1, 2011 as a result of
6 implementing its Smart Meter Plan. As I previously explained, under the Smart
7 Meter Settlement, PECO is entitled to recover this additional depreciation by adding
8 it to its unrecovered investment in AMR meters as of January 1, 2011 and recovering
9 the total over a ten-year period ending December 31, 2020. The amounts in column 1
10 for years 2011 through 2014 reflect the depreciation PECO will record on its books of
11 account in each year to fully depreciate its remaining investment in AMR meters by
12 the end of 2014. The total for column 1 of \$110.3 million is the amount PECO is
13 entitled to recover.

14 Column 2 shows the annual accruals for depreciation associated with PECO's
15 investment in AMR meters that PECO is recovering in its base rates. The annual
16 accrual is slightly more than \$10.0 million, which is why column 2 sums to \$100.5
17 million.

18 Column 3 is the difference between columns 1 and 2 and reflects the additional
19 depreciation (\$9.8 million) that PECO must include in its SMCRS in order to fully
20 recover its investment in AMR meters during the ten-year recovery period approved
21 in the Smart Meter Settlement.

¹ Exhibit ABC-2 is identical to Appendix E to the Company's Smart Meter Universal Deployment Plan (PECO Exhibit 1).

1 13. Q. Please explain the derivation of the additional \$900,000 of state income tax
2 expense that must be included in the SMCRS to reflect the retirement of AMR
3 meters in conjunction with the accelerated universal deployment of smart
4 meters.

5 A. PECO is required to “flow-through” in its rates charged to customers the state tax
6 effect of the difference between depreciation expense recorded per books and the
7 depreciation it is permitted to deduct for income tax purposes. The decision to
8 accelerate the deployment of smart meters, which also drives the retirement of AMR
9 meters, affects that book-tax difference and must be reflected in the SMCRS.
10 Specifically, and as I will explain, based on the depreciation deductions underlying
11 the state tax expense being recovered in PECO’s base rates, customers would pay in
12 rates a level of state income tax expense that is understated because it is based on tax
13 depreciation that exceeds the amount of depreciation PECO is actually permitted to
14 deduct.

15 Column 1 of the spreadsheet at the top of Exhibit ABC-2 shows the depreciation
16 PECO will book to fully depreciate its remaining investment in AMR meters, which
17 totals \$110.3 million. The first column in the lower half of the exhibit, which is titled
18 “Tax Depreciation Under Accelerated Depreciation,” shows the depreciation
19 deductions PECO will be permitted to take to fully depreciate its tax “basis” in the
20 AMR meters, which total \$47.3 million. The difference between the two (\$63.0
21 million) is the amount by which PECO’s book depreciation exceeds its tax
22 depreciation and represents an addition to taxable income. Stated another way, PECO

1 will pay state income tax on \$63.0 million that represents the excess of book
2 depreciation over tax depreciation related to its investment in AMR meters.

3 Column 2 of the spreadsheet at the top of the exhibit shows the annual depreciation
4 expense PECO is recovering in base rates, which, through December 31, 2020, will
5 total \$100.5 million. At the same time, PECO's base rates include income tax
6 expense that was calculated on the basis of tax deductible depreciation related to
7 AMR meters of \$4.7 million per year, which, through December 31, 2020, totals
8 \$51.8 million, as shown in the second column of the table in the lower half of Exhibit
9 ABC-2. The difference between \$100.5 million and \$51.8 million (\$48.7 million) is
10 the amount by which PECO's depreciation expense being recovered in rates exceeds
11 the tax depreciation deductions used to calculate the income tax expense being
12 recovered in rates. Thus, \$48.7 million is the tax expense that PECO will recover
13 under its existing rates because of the timing difference between depreciation expense
14 and depreciation deductions embedded in its existing rates. Thus, the sum of \$51.8
15 million represents the tax depreciation deductions customers will have received
16 because of the faster depreciation permitted for tax purposes which, under flow-
17 through accounting, have been passed-through to them in the ratemaking process as
18 lower state income tax expense. However, because total tax deductions cannot
19 exceed the basis (investment) in the property being depreciated, the difference
20 between book and tax depreciation "turns around," and that timing difference results
21 in higher tax expense in the later years of the service life of depreciable property
22 which, as I previously explained, is \$48.7 million.

1 Based on PECO's actual remaining investment in AMR meters and the amount of
2 remaining tax depreciation it may deduct for income tax purposes, it will pay income
3 tax on \$63.0 million of additional taxable income generated by book-tax timing
4 differences. At the same time, the timing difference embedded in PECO's base rates
5 will provide for the recovery of income tax on only \$48.7 million of additional
6 taxable income. The difference between these two figures (\$14.3 million) is the
7 additional taxable income that must be reflected in calculating PECO's SMCRS.
8 Based on the state income tax rate of 6.5%, the additional state income tax that must
9 be included in the SMCRS is approximately \$0.9 million, as shown in column 6 of
10 the spreadsheet on the top half of the exhibit. This amount must be grossed-up for
11 federal and state income taxes and gross receipts tax, as shown in column 7, which
12 results in a total addition to the SMCRS of \$1.7 million.

13 **14. Q. Mr. Cohn, you have calculated the state income tax effects resulting from timing**
14 **differences that must be included in the SMCRS. Do the same tax timing**
15 **differences affect the Company's federal income tax expense and, if so, why is no**
16 **adjustment to the SMCRS being proposed for federal taxes?**

17 A. The tax timing differences I explained above do not have a comparable impact on
18 federal income tax expense embedded in PECO's base rates because, for federal
19 taxes, PECO is required to "normalize" tax-book timing differences. Under the
20 "normalization" method, PECO's annual federal tax expense recovered in rates is not
21 affected by such tax timing differences. The acceleration of universal smart meter
22 deployment – and associated accelerated depreciation of PECO's AMR investment –
23 will affect the amount of deferred taxes PECO records each year during the recovery

1 period. However, by the end of the recovery period, the net total accumulated
2 deferred taxes PECO will have recorded on its books will be the same regardless of
3 the depreciable lives used to depreciate PECO's AMR investment.

4 **15. Q. What is the total revenue requirement associated with the depreciation of**
5 **PECO's remaining investment in AMR meters?**

6 A. The annual revenue requirement impact is the total increase above the amount being
7 recovered in PECO's base rates, which is the sum of column 3 (\$9.8 million) and
8 column 7 (\$1.7 million) on the top half of Exhibit ABC-2, or a total of approximately
9 \$11.5 million over the ten-year recovery period. This amounts to an annual increase
10 of approximately \$1.1 million in the SMCRS.

11 **III. CONCLUSION**

12 **16. Q. Does that conclude your direct testimony?**

13 A. Yes.

Exhibit ABC-1

Listing of Prior Case Testimony

Maryland

Conowingo Power Company Case No. 7982 – Revenue, expense, rate base and taxes

Conowingo Power Company Case No. 8352 – Revenue, expense, rate base and taxes

Federal Energy Regulatory Commission

Docket No. ER91-478 – Revenue, expense, rate base, taxes, cost of service and rate design

Docket No. ER04-156 – Revenue Requirement under Schedule 12 of the PJM OATT

Pennsylvania

Docket No. R-891364 – Revenue, expense, rate base and depreciation

Docket No. I-900005 – Impact of demand side management on off-system sales

Docket No. R-922479 – Appropriate ratemaking treatment of SFAS 106

Docket No. R-973877 – Quantification of assets, jurisdictional allocation, revenue requirement and allocation of revenue requirement

Docket No. R-973953 - Quantification of assets, jurisdictional allocation, revenue requirement and allocation of revenue requirement

Docket No. C-20016610- Appropriate discount rate for use in determining a CTC buyout

Docket No. P-072260 – Appropriate cost recovery mechanism for providing full and current recovery of cost of complying with the Alternative Energy Portfolio Standards

Docket No. P-2008-2062739 – Default Service Tariff Changes

Docket No. P-2008-2062741 – Market Rate Transition Phase-In Rider and Cost Recovery

Docket No. M-2009-2093215 – Energy Efficiency and Conservation Plan, Avoided Cost Projections

Docket No. M-2009-2123944 – Cost Allocation and Cost Recovery Mechanism for Smart Meter Costs

Docket No. R-2010-2161575 – Rate Design/Revenue Allocation/Tax Repair

Docket No. R-2010-2161592 - Merchant Function Charge/Tax Repair

Docket No. P-2012-2283641 - Default Service Program Rate Design and Tariff Changes

Exhibit ABC-2

**Estimated State Tax Flow Through Impact from Accelerated AMR
Depreciation ***
(\$M as of January 18, 2013)

	Actual Book Depreciation (1)	Recovered in Base Rates (2)	Accelerated Depreciation Under the Settlement Recovery over 10 yrs (3)	Tax Depreciation from Acceleration ¹ (4)	Net Additional Book/Tax due to Acceleration (5)=(3)-(4)	Additional State Income Tax @6.5% (6)=(5)*6.5%	Revenue Requirement (7)=(6)/(1-T)/(1-GRT)
2010	\$ 10.9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2011	\$ 25.4	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2012	\$ 29.1	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2013	\$ 36.2	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2014	\$ 8.7	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2015	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2016	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2017	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2018	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2019	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2020	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
Total	\$ 110.3	\$ 100.5	\$ 9.8	\$ (4.4)	\$ 14.2	\$ 0.9	\$ 1.7

¹ Amortization of tax depreciation from acceleration (as shown in column 4 above) is developed as shown in the following table:

	Tax Depreciation Under Accelerated Depreciation	Tax Depreciation Included in Base Rates	Difference
2010	\$ 5.7	\$ 4.7	\$ 1.0
2011	\$ 7.0	\$ 4.7	\$ 2.3
2012	\$ 8.8	\$ 4.7	\$ 4.1
2013	\$ 13.6	\$ 4.7	\$ 8.8
2014	\$ 12.3	\$ 4.7	\$ 7.6
2015	\$ -	\$ 4.7	\$ (4.7)
2016	\$ -	\$ 4.7	\$ (4.7)
2017	\$ -	\$ 4.7	\$ (4.7)
2018	\$ -	\$ 4.7	\$ (4.7)
2019	\$ -	\$ 4.7	\$ (4.7)
2020	\$ -	\$ 4.7	\$ (4.7)
Total	\$ 47.3	\$ 51.8	\$ (4.4)
		Amortized over 10 years =	\$ (0.4)

* Note: All figures shown are latest estimates and are for illustrative purposes only.

PECO Exhibit 1

Smart Meter Universal Deployment Plan

**SMART METER
UNIVERSAL DEPLOYMENT PLAN**

January 18, 2013

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1. Executive Summary

On August 14, 2009, PECO Energy Company (“PECO” or the “Company”) filed its *Smart Meter Technology Procurement and Installation Plan (Docket No. M-2009-2123944)* (“Smart Meter Plan” or “Plan”) as required by Pennsylvania’s Act 129 and the Implementation Order¹ issued by the Pennsylvania Public Utility Commission (“Commission” or “PUC”). Following hearings and briefing, the Company’s Plan was approved, with minor modification, by the Commission in an Order entered April 22, 2010. PECO is now proposing to implement the second phase (“Phase Two”) of its Smart Meter Plan, to complete substantially the installation of electric Smart Meters across its entire service territory by the end of 2014.

PECO has successfully executed or is on target to complete all of the planned elements of its Phase One deployment as detailed in its Plan. As the Company committed, PECO has implemented a well-managed and structured Smart Meter Plan to manage both costs and risks. PECO has mitigated cost through a disciplined procurement process and has mitigated risks by executing a planned, layered test process to effectively validate the Smart Meter technology. PECO has also executed a deployment of the core, underlying Advanced Metering Infrastructure (“AMI”) technologies and established a reliable technological foundation for the universal deployment of Smart Meters (Phase Two). Finally, PECO has deployed the required technology and completed planning to implement a dynamic pricing and customer acceptance program to gauge how customers will utilize new pricing options that may be facilitated by Smart Meters.

PECO began general deployment of Smart Meters in March 2012, as set out in Phase One of the Smart Meter Plan. After experiencing a number of meter events during the spring and early summer of 2012, PECO temporarily suspended the installation of meters to additional

¹ See *Smart Meter Procurement and Installation Implementation Order by the Commission*, Docket No. M-2009-2092655 (Order entered June 24, 2009).

customers while those problems were thoroughly investigated. Following resolution of the metering issues, PECO restarted its deployment on November 19, 2012. Notwithstanding the schedule disruption, the Company still expects to complete Phase One deployment of 600,000 Smart Meters by June 2013.

The estimated costs presented in PECO's Smart Meter Plan have proven to be reasonably accurate. PECO currently projects that the cost of the Phase One deployment will be approximately \$313 million, which is slightly higher than the upper end of the \$250 - \$300 million range set forth in the Smart Meter Plan. Similarly, the estimated cost to complete the universal deployment of meters in Phase Two is \$282 million, compared to a preliminary Plan estimate of \$250 million. Appendix A provides a summary of current estimated costs compared to original Plan estimates. PECO proposes to recover the costs of executing the Smart Meter Plan through its existing Smart Meter Cost Recovery Surcharge ("SMCRS"), which was implemented at the conclusion of the Phase One proceeding. In addition, the Company requests that it be allowed to defer the expensing of certain costs related to the replacement of initially deployed Sensus meters and to seek recovery of such costs through future SMCRS filings.

2. PECO's Smart Meter Plan

In response to the Smart Meter requirements of Act 129, and to comply with the Commission's Smart Meter Implementation Order, PECO developed a procurement and installation plan that began with a disciplined and detailed assessment of various technology and deployment options that could be employed to meet the Act's requirements. PECO retained, and its efforts were supported by, consultants with unique expertise and knowledge in the development of AMI system strategies. The consultants included Enspira Solutions, Inc. (now part of Black and Veatch) and Accenture, two firms with specific expertise in AMI technology and system integration.

PECO also established a Program Management Office ("PMO") that provides organization and support, and fosters accountability for the Company's Smart Grid & Smart Meter ("SGSM") project. The PMO serves as a central source for information that enables effective decision making, facilitates the fulfillment of external reporting requirements and furthers the realization of the defined project goals. To support its efforts, PECO retained Greencastle Consulting to leverage its systematic approaches to project governance and project management.

Act 129 defines Smart Meter technology in terms of providing bidirectional communication capability that records electricity usage on at least an hourly basis. The Act further states that the Smart Meter technology must (1) provide customers with direct access to price and consumption information, (2) furnish them with direct information on their hourly consumption, (3) enable the implementation of time-of-use rates and real-time pricing programs, and (4) effectively support the automatic control of electricity consumption by the customer, the electric distribution company ("EDC") or a third-party, at the customer's request.

In its Implementation Order, the Commission stated its belief that Act 129 set forth minimal requirements and observed that Smart Meter technology can support more than just demand response and pricing programs. For example, Smart Meters have the ability to support a host of different functions, including maintenance and repair, theft detection, system security, consumer assistance, customer-generator net metering, and other programs that increase an EDC's efficiency and reduce its operating costs. Therefore, the Commission directed that an EDC's chosen Smart Meter technology must have the following capabilities:

1. Bidirectional data communications.
2. Remote disconnection and connection.
3. Ability to provide 15-minute or shorter interval data to customers, electric generation suppliers ("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.
4. A minimum of hourly reads delivered at least once per day.
5. On-board meter storage of meter data that complies with nationally recognized non-proprietary standards such as ANSI C12.19 and C12.22 tables.
6. Open standards and protocols that comply with nationally recognized non-proprietary standards, such as IEEE 802.15.4.
7. Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible.
8. Ability to monitor voltage at each meter and report data in a manner that allows EDC to react to the information.
9. Remote programming capability.

10. Communicate outages and restorations.
11. Ability to support net metering of customer-generators.
12. Support automatic load control by EDC, customer and third-parties, with customer consent.
13. Support time-of-use and real-time pricing programs.
14. Provide customer direct access to consumption and pricing information.

The technology and equipment being installed by PECO was obtained through a rigorous procurement process to ensure it possesses all of the foregoing capabilities.

In its 2009 filing, PECO proposed to implement its Smart Meter Plan in two phases. Phase One would focus on the selection of the AMI technology to be deployed, the implementation of a meter data management system (“MDMS”) and other information technology (“IT”) investments, including the testing and validation of the AMI technology and the deployment of the AMI communication network. Phase One was also expected to include the deployment of Smart Meters in controlled quantities and the development and implementation of a program to test dynamic pricing and customer acceptance. Phase Two would then complete the full-scale deployment of Smart Meters across PECO’s entire service territory.

PECO proposed three major filings with the PUC and a separate, but contemporaneous, grant application with the U.S. Government pursuant to the American Recovery and Reinvestment Act (“ARRA”). The first filing was fulfilled with PECO’s Smart Meter Plan filed with the Commission on August 14, 2009. PECO subsequently entered into a Joint Petition for Partial Settlement (“Settlement”) with intervening parties, which was filed with the Commission on November 25, 2009. The Commission, on April 22, 2010, issued an Opinion and Order

approving PECO's Smart Meter Plan² and Settlement, including the Company's Phase One plan for procurement of the necessary AMI technology, the initial IT work (including the initial MDMS investment) and the procurement of an initial quantity of Smart Meters.

As part of its approved Plan, PECO committed to separately filing a dynamic pricing and customer acceptance program. That second filing was made on October 28, 2010 and was subsequently approved by the Commission on April 14, 2011.³ On April 29, 2011, the Commission initiated a retail electricity market investigation with the goal of "making improvements to ensure that a properly functioning and workable competitive retail electricity market exists in the state."⁴ As part of that investigation, the Commission issued the *Retail Market Order*, which recommended that "Energy Delivery Companies (EDCs) contemplate contracting with an Electric Generation Supplier (EGS) in order to satisfy their [Act 129] time-of-use (TOU) requirement."⁵ In response to the Commission's *Retail Market Order*, PECO revised its dynamic pricing plan to include participation by an EGS and subsequently filed a revised plan to reflect the change on April 2, 2012. The Commission approved PECO's revised dynamic pricing plan on September 13, 2012.⁶ Finally, PECO's approved Smart Meter Plan called for a third filing to be submitted toward the end of the Implementation Order grace period, describing the Company's plan for the universal deployment of Smart Meters throughout its

² See Commission's *Opinion and Order on Petition of PECO Energy Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123944 (Order entered May 6, 2010).

³ See Commission's *Opinion and Order on Petition of PECO Energy Company for Approval of its Initial Dynamic Pricing and Customer Acceptance Plan*, Docket No. M-2009-2123944 (Order entered April 15, 2011).

⁴ See *Investigation of Pennsylvania's Retail Electricity Market: Recommendations Regarding Upcoming Default Service Plans*, Docket No. I-2011-2237952 (Order entered April 29, 2011).

⁵ See *Investigation of Pennsylvania's Retail Elec. Market: Intermediate Work Plan*, Docket No. I-2011-2237952 (Order entered March 2, 2012) ("*Retail Market Order*").

⁶ See Commission's *Opinion and Order on Petition of PECO Energy Company for Expedited Approval of its Dynamic Pricing Plan Vendor Selection and Dynamic Pricing Plan Supplement*, Docket No. P-2012-2297304 (Order entered September 26, 2012).

service territory. The submission here is that third filing anticipated by PECO's initial Smart Meter Plan.

Concomitant with the filing of PECO's Smart Meter Plan in 2009, PECO also applied for a \$200 million Smart Grid Investment Grant ("SGIG") from the Department of Energy ("DOE"). In November 2009, PECO was informed by the DOE that it was the recipient of the \$200 million SGIG. Approximately \$140 million is being applied to the net costs of PECO's Smart Meter Phase One deployment⁷. As committed in PECO's Smart Meter Plan, PECO has used a substantial portion of those grant funds to expand the initial deployment of Smart Meters during Phase One, increasing the deployment from 100,000 meters to 600,000 meters. Because of the receipt of SGIG monies to offset deployment costs, PECO also committed to universal deployment of Smart Meters within 10 years, rather than the fifteen year deployment permitted by Act 129. Under the terms of its Grant Agreement with the DOE, PECO is obligated to complete the Phase One installation of 600,000 Smart Meters by April 2014.

The costs of PECO's Smart Meter Plan were carefully estimated and validated with key potential AMI vendors. The costs of Phase One, including the installation of 600,000 meters, were preliminarily estimated at \$250 - \$300 million. The Plan also projected that the total Smart Meter Plan project, including the universal deployment of meters to the remaining 1.2 million PECO customers, would cost between \$500 and \$550 million. As noted previously, PECO now estimates that Phase One will cost \$313 million and Phase Two will cost approximately \$282 million.⁸ The Commission also approved PECO's proposal to recover the net costs of its Smart Meter Plan (i.e., total project costs less DOE reimbursements and net of avoided AMR costs and

⁷ The remaining \$60 million of SGIG funds from the DOE are being applied to the net costs of PECO's Smart Grid investment.

⁸ These estimates do not reflect approximately \$18 million of costs (net of DOE reimbursement) related to the meter events experienced during Phase One.



operational benefits as identified in its original Smart Meter Plan filing) through a reconcilable surcharge (the SMCRS) under Section 1307 of the Public Utility Code.

3. Smart Meter Plan Phase One Status

PECO has completed most of the tasks for Phase One of its Smart Meter Plan, including vendor selections, technology selections, testing, and initial deployment steps.

3.1 Vendor Selection and Contracting Process

PECO has executed contracts for all key Smart Meter technology and system components required for the successful implementation of Phase One of its Plan. The following table is adapted from the Company’s original Smart Meter Plan and details the key system components and selected contract vendors.

Table 1: AMI System Components

Component	Definition	Contracted Vendor(s)
AMI Network	Comprised of: 1) Network components (collectors, router, and repeaters) that connect Smart Meters to the AMI Host via higher capacity communication transport technologies 2) AMI Host, which is a computer system that acts as the network controller	Sensus USA, Inc.
Communications Network(s)	Comprised of: 1) Core Foundation Network, which is a higher capacity transport system from the AMI Network to the AMI Host 2) Additional communications solutions that bridge between the AMI Network and the Core Foundation network when necessary	Alcatel-Lucent USA, Inc.
MDMS	The Meter Data Management System which: 1) Serves as a repository for meter interval usage and event data 2) Performs validation, editing and estimating (VEE) operations on raw data to allow the data to be used for billing purposes	Oracle America, Inc.
Middleware	Standard software components that manage the integration of: 1) The AMI Host with the MDMS 2) The MDMS with IT back office systems to perform customer billing, outage management and other critical business functions	IBM Corporation
System Integration	IT professional services that are engaged in the analysis, design, build, test and deploy phases of the integration of the AMI Host, MDMS, Middleware and IT back office systems	Accenture

<p>Meters</p>	<p>The physical Smart Meter end points that are used to record and store interval usage data and events and communicate to the AMI Network</p>	<p>Meters: Sensus USA, Inc.; Elster Solutions, LLC; Landis+Gyr (L+G)</p> <p>Meter Installation: Grid One Solutions</p>
<p>Web Presentment</p>	<p>A web presentment platform that enables customers to view their own consumption data and supports the implementation of the “Green Button” initiative.</p>	<p>Opower, Inc.</p>

3.1.1 Selection of AMI Network Vendor

PECO engaged in a careful and thorough process to select its AMI Network vendor. Of particular importance was the need for an AMI Network vendor to meet the requirements of Act 129. For example, following an initial 30-month grace period, EDCs must furnish Smart Meters to customers who request them, regardless of whether those requests are in accordance with the EDC’s deployment plan. This statutory requirement, in turn, can, and in PECO’s case did, inform the decision as to the type of AMI Network selected.

By way of illustration, a mesh-type AMI communications network utilizes deployed AMI meters to communicate in a peer-to-peer manner with other AMI meters on the system to ultimately communicate with the entire AMI system. This type of AMI system relies on a minimum density of deployed meters to maintain reliable communications. If an individual customer situated at a remote location within the service territory were to request a meter prior to PECO’s planned deployment of the Smart Meter mesh to that area, meters would have to be deployed out of sequence, in sufficient density, and in specific locations to accommodate that remote customer. Conversely, a point-to-point communications network (like Sensus) relies upon communications towers erected throughout the service territory. The communication towers provide a much broader communications footprint such that each meter communicates directly with the AMI network with minimal reliance on neighboring meters to complete the

communication paths. Thus, with a point-to-point system, it is much easier to install a remote meter and have it communicate immediately with the network. In short, the AMI technology selected by PECO specifically, efficiently and cost effectively will accommodate *ad hoc* requests for the installation of Smart Meters.

Immediately following the filing of its Smart Meter Plan in the summer of 2009, PECO conducted a series of workshops with AMI vendors. After an exhaustive information gathering effort, PECO implemented a detailed Request for Proposal (“RFP”) process. This process involved a well proven methodology for the solicitation, evaluation, and prudent selection of the “best fit” vendor solution to execute PECO’s Smart Meter Plan. The vendor selection criteria used in the RFP evaluation process were the Technical Analysis, Commercial Assessment, Risk Assessment (*i.e.*, business risk), and Financial Health of the vendor. In addition, the Technical Analysis scored the vendor on several factors, including network performance, interoperability, technological maturity, technology risk, network performance, and security. The vendor responses were evaluated and narrowed to a list of three finalists. Of the three, Sensus was selected based on rankings of all four evaluation criteria. An important factor in Sensus’ selection as PECO’s AMI network vendor was the fact that its technology utilizes a point-to-point network and thus provides PECO with the ability to comply with Act 129’s requirement that EDCs accommodate individual customer requests for meters prior to full-scale deployment in the customer’s service area.

PECO tested the meters of four different suppliers: (Sensus, L+G, Elster, and General Electric) and identified meters that would be compatible with the Sensus AMI network and meet the Act 129 (and PECO’s) Smart Meter requirements. From this process, PECO decided to obtain AMI meters from both Sensus and L+G for its Phase One deployment. Subsequently,

following a series of overheating events with Sensus meters, PECO elected to temporarily suspend the Phase One Smart Meter deployment and replace installed Sensus iCon A Form 2S-RD meters with equivalent L+G meters.

3.1.2 Meter Testing/Technology Acceptance

PECO began testing AMI meters at its Berwyn Meter Shop in September 2010. The Berwyn site includes an indoor lab for shop testing, first article testing and accuracy testing. The site also includes a sample of meters in an outdoor yard where functional testing is performed to ensure that the meters and network systems meet Act 129 requirements. The outdoor testing simulates conditions where network communications, outages, remote connection and disconnection and other required functionalities can be tested and confirmed.

PECO expanded its meter testing by deploying AMI meters in controlled suburban and urban test environments. In the August 2011 – October 2011 timeframe, PECO installed 200 AMI meters in the suburban Berwyn area for accuracy and functional testing. In the October 2011 - November 2011 timeframe, PECO installed an additional 150 AMI meters in Philadelphia to perform urban environment testing. The goal was to conduct the same accuracy and functionality testing as in Berwyn, but within a dense city environment. The suburban and urban testing provided evidence that the network and meters were capable of successfully meeting the Act 129 requirements. Finally, between December 2011 and the end of February 2012, PECO installed 1,800 AMI meters on customer and employee premises. This early deployment provided an additional opportunity to test the installation and billing processes, network performance and customer acceptance of the AMI meters.

In addition to the testing summarized above, PECO participated in a “Performance Evaluation of Integral Disconnect Switches for Single-Phase Revenue Meters” hosted by the National Electric Energy Testing Research and Applications Center (“NEETRAC”)⁹ in May 2010. The evaluation was conducted by an electric industry consortium, and its purpose was to test the disconnect functionality in AMI Meters. The testing was important from both a safety and functionality standpoint, as the remote connect-disconnect functionality was a requirement of the Commission’s Implementation Order. NEETRAC evaluated the meter disconnect switches for, among other things, risks to customer premises from overheating or fires as a result of the disconnect switch. NEETRAC tested five meters made by Sensus, L+G, Elster, Itron and Echelon. No abnormal temperature changes were found during the tests that would indicate the switches were prone to causing overheating or fires.

3.1.3 Filing of Smart Meter Vendor Contracts

On February 16, 2011, PECO filed its AMI Meter contracts with Sensus, L+G and Elster with the Commission. Although the Commission did not require PECO to seek approval of the contracts, the Company did so nonetheless to demonstrate that it was implementing its proposed and approved Smart Meter Plan. PECO also filed the AMI Meter contracts to provide the Commission with an opportunity to review the terms and comment.

3.2 Phase One Smart Meter Technology Deployment

PECO has successfully deployed the underlying infrastructure required to provide Smart Meter technology to its customers in compliance with Act 129 and the Implementation Order.

⁹ NEETRAC is a self-supporting, membership based center within the School of Electrical and Computer Engineering at Georgia Tech.

As part of this infrastructure investment, PECO has installed the core AMI communications network, consisting of 163 Tower Gateway Base-stations (TGBs) to communicate between AMI Meters installed in the field and PECO's AMI system controller. PECO has also successfully implemented the key IT System elements required for the initiation of Smart Meter deployments as part of its Phase One efforts. These include the implementation of the AMI System Applications and Network Controllers, initial deployment of the MDMS, the deployment of the Enterprise Service Bus (or "Middleware"), and initial integration of the AMI network into PECO's billing and "back office" systems. These underlying technologies were evaluated for successful integration and performance characteristics through a sequence of escalating acceptance tests, which focused on ensuring the functionality of installation tools, deployment processes, system interfaces, billing procedures and meter accuracy.

In its Smart Meter Plan, PECO planned to leverage MDMS systems then being used in a pilot project at Exelon. However, technical limitations were discovered during further testing by PECO of the MDMS being used in the Exelon pilot. In response, PECO promptly contracted with an alternate MDMS vendor whose system had been thoroughly assessed during the RFP process. In addition, PECO designed an interim solution that allowed for initial deployment of Smart Meters without an installed MDMS. That interim plan was successful as the IT systems were in place to begin meter deployment earlier and allowing for a gradual phase-in of the new MDMS system which is now underway.

Following field tests, general deployment of Smart Meters began in March 2012. As the number of deployed meters increased, PECO began to experience and track specific meter events at certain properties where the Form 2S-RD Sensus Smart Meter was installed. While some issues may be expected when extracting and replacing a large numbers of meters, the nature of

some of the meter events, specifically overheating, began to raise safety concerns. Because of those concerns PECO immediately began to investigate the meter events and to gather data to try to identify and resolve the cause(s) of those events. PECO also established processes to respond rapidly to any additional reported meter events. PECO temporarily suspended the installation of Smart Meters to additional customers and initiated testing by respected independent testing laboratories of vendors' meters as part of its effort to identify the cause(s) of the meter events and to assure the safety of the meters it would install in the future. In that regard, PECO retained Underwriters' Laboratory ("UL") to test L+G meters and, based on that testing, UL concluded that L+G meters were safe for consumer use. In addition, PECO began to use meters manufactured by L+G to replace previously-installed meters of the type that had experienced meter events. PECO intends to move forward with L+G meters during universal deployment, but continues to evaluate meters from other vendors (including other meter models of the vendor who provided the previously-installed meters), leaving open the possibility of using more than one meter vendor during universal deployment. If PECO does so, it will notify stakeholders and the Commission.

3.3 Stakeholder Collaborative Process

Pursuant to the Commission's April 22, 2010 Order, PECO initiated a collaborative process with interested statutory advocates, government entities, meter-technology providers and other stakeholders to promote a robust dialogue regarding effective and efficient implementation of the Plan. To date, PECO has held fourteen collaborative meetings to review the overall progress of the Smart Meter Plan implementation (e.g. network deployment, sourcing, budget, and IT system deployment). Generally, these collaborative meetings have been well attended by representatives from the Office of Consumer Advocate (OCA), the PUC's Bureau of

Investigation and Enforcement (I&E), the Office of Small Business Advocate (OSBA), the Philadelphia Area Industrial Energy Users Group (PAIEUG), the Philadelphia Housing Authority (PHA) and other stakeholders. PECO has also held seven separate PUC briefings to provide up-to-date information on key issues. These briefings were generally attended by 25-30 representatives of various PUC Commissioner Staffs, Bureaus and Offices. Appendix B summarizes the collaborative meetings and PUC briefings held to date and the key topics discussed at those meetings.

These stakeholder collaborative meetings have been highly successful in communicating the Smart Meter Plan to affected stakeholders and in providing an understanding of the scope of the investment, technology being implemented, and the expected impacts. For example, the on-site tour held at PECO's Berwyn complex on June 17, 2011, familiarized the PUC staff and other stakeholders with AMI network and meter technology, including distribution automation ("DA") technology validation and in-home device demonstrations.

PECO plans to continue this stakeholder collaborative process through Phase Two.

4. Phase One Completion Plan

PECO expects to conclude the deployment of the underlying advanced metering infrastructure, including the initial deployment of 600,000 Smart Meters, by June 2013. Notably, PECO has already completed the deployment of the AMI network, which will enable the installation of Smart Meters upon customer request and for all new construction.

4.1 Smart Meter Deployment Schedule

In accordance with its Smart Meter Plan, PECO is coordinating field installation efforts with its primary installation contractor, Grid One Solutions, maintaining processes to ensure quality and safety during the installation process. Notwithstanding the meter events that resulted in the temporary suspension of deployment and the replacement of installed Sensus Smart Meters, PECO expects to complete deployment of the initial 600,000 Smart Meters by June 2013. To this end, PECO has devoted a specific team of PECO electrical technicians and back office staff to support the installation process, mitigate field installation issues, and efficiently process customer exceptions identified as part of the upgrade of the existing AMR radio meters to new AMI Smart Meters. As of this filing, PECO has installed over 300,000 smart meters at customer premises.

4.2 IT System Deployment

During Phase One, the information technology (“IT”) infrastructure required for initial deployment of Smart Meters was successfully implemented and tested. The IT systems will continue to be modified, upgraded, and enhanced as part of the completion of Phase One and Phase Two. As part of the completion of Phase One, additional IT system capabilities are anticipated, including the following:

- MDMS Interval Usage synchronization: Ensure that all interval data processed and sent to systems and external parties remains synchronized across those systems. Implement validation and audit mechanisms to validate this information.
- Remote Connect/Disconnect functional integration: Implement the integrated remote connect/disconnect functionality of the AMI Network and Meters with PECO's Work Management systems.
- Integration of Meter Outage Event Data to Outage Management System: Utilize power out and power up alarms to more quickly identify outage conditions and nested outage situations. Received meter alarms will be validated and sent to the Outage Management System for inclusion in the outage analysis along with data from customers and SCADA.
- Systems to support the Dynamic Pricing Program: Implement the necessary customer and usage data integration with Dynamic Pricing vendors to enable new Dynamic Pricing rates for customers. Additionally, support the AMI Network integration to test and validate the capabilities of in home technologies.
- Rollout of interval data Web Presentment: Implementation of Web Presentment to customers via the PECO OPower solution. Customers will have access to their AMI meter interval data through PECO's web site within the required timeliness of Act 129. The web presentment solution will also enable the "Green Button" initiative which will allow customers to securely download their own easy-to-understand energy usage information when it is implemented.
- Provision of Interval Data to Third Parties: Implement solutions to receive notification from third parties of the desire to receive interval data from customer



AMI meters as well as the ability to deliver that data for both billing and historical data purposes.

PECO anticipates that these additional capabilities will enable the conversion of PECO's Regional Transmission Organization (RTO) settlement process from the use of aggregate load curves to interval-based billing by 2015.

5. Phase Two Universal Deployment Plan

PECO is proposing to substantially complete Phase Two's universal deployment of Smart Meters by the end of 2014. This proposal is based on a robust cost-benefit analysis of the 2014 deployment scenario and a more deliberate deployment plan calling for full deployment by the end of 2019. The accelerated schedule was chosen, in large part, in recognition of the customer benefits arising from the remote connect functionality of AMI technology,¹⁰ including:

- Expanded opportunity to participate in energy efficiency programs, enabling customers to better understand and manage their energy needs.
- Expedited delivery of operational benefits, including avoided connection costs and reduced charge-offs and societal benefits due to the ability to disconnect hard-to-reach meters.
- Avoidance of ongoing electric automated meter reading ("AMR") managed service fees associated with existing AMR meters.
- Mitigation of potential AMR transition costs and system obsolescence.
- Economies of scale from both volume purchase opportunities for Smart Meters, as well as synergies between Phase One and Phase Two that will reduce deployment costs.

5.1 Plan Overview

The proposal to accelerate the universal deployment of Smart Meters anticipates the procurement and installation of approximately 1.2 million Smart Meters, and associated IT infrastructure scaling to manage the expanded number of electric meter reads, over two years

¹⁰ Between July and October 2012, PECO completed a pilot utilizing the remote disconnect ("RCD") feature. In these 4 months, PECO conducted 550 transactions (both move-in/move-out as well as terminations/restorations for delinquency). During the pilot PECO achieved a 94% success rate executing the transactions within an average of 24 seconds. Lessons learned from the pilot will be built into the 2013 automated RCD program functionality.

(2013 – 2014). While PECO expects to substantially replace all existing AMR meters with Smart Meters by the end of 2014, a small percentage of the meter population (*i.e.*, “difficult-to-access” meters) will not be reached until after the targeted conclusion of Phase Two. These meters will be converted to Smart Meters in an efficient and safe manner following all current practices for acquiring access to these meter sites. In addition, some of the existing commercial or industrial meters that are currently providing many Smart Meter capabilities under a separate technology may be migrated to the Smart Meter system following the completion of Phase Two.

PECO’s Plan for universal deployment will require the following additional IT infrastructure upgrades to support the expanded capacity of Smart Meters:

- Interval data based settlement capability: Upgrade PECO’s systems to settle the retail market based on actual interval data rather than generic load profiles.
- Expansion of the AMI Infrastructure and Business Continuity/Disaster Recovery Solution: Validate the capacity and disaster recovery capabilities of the IT Infrastructure (servers, storage, etc.) installed for Phase One to ensure scalability up to 1.6 million in Phase Two.
- AMI Enhancements: Validate capacity and scalability of all applications implemented and developed for Phase One to ensure scalability up to 1.6 million meters in Phase Two.
- MDMS upgrade to the next generation offered by the vendor for capacity, performance, and continued vendor supportability: A lifecycle upgrade of the MDMS.

5.2 Economic Analysis

PECO estimates that it will cost approximately \$282 million to complete Phase Two of the Plan by the end of 2014. As shown in Table 2 below, this figure is offset by approximately \$342 million of projected cost savings. In contrast, the more deliberate schedule alternative of full deployment by 2019 would cost customers approximately \$58 million more on a net present value basis due primarily to (1) an increase in meter hardware and installation costs and (2) ongoing AMR fees.

Table 2: Estimated Phase Two Costs and Benefits for 10 Year Period (2012-2021)

Cost/Benefit Category	10-Year: Completion by end of 2019 (\$M)	Accelerated: Completion by end of 2014 (\$M)
AMI Deployment costs	(\$252.6)	(\$242.4)
IT Enablement costs	(38.9)	(34.0)
Business Integration costs	(5.7)	(5.7)
Total Phase Two Costs	(\$297.1)	(\$282.1)
Total Benefits	\$231.5	\$341.8
Total Net (Costs) - Benefits	(\$65.6)	\$59.7
<i>Net Present Value of (Costs) - Benefits*</i>	<i>(\$75.9)</i>	<i>(\$17.7)</i>

* see Appendix C for detail

5.3 Accelerated AMR Depreciation

Completion of the Phase Two universal deployment by the end of 2014 will result in a significant acceleration of the depreciation of the AMR meters. Consistent with the settlement of the Company's Phase One proceeding at Docket M-2009-2123944, the accelerated depreciation will be recovered ratably through the year 2020. The acceleration of depreciation also has the effect of deferring the reversal of state tax benefits previously flowed through to customers to synchronize with the recovery of the plant investment. Appendix E illustrates the net state income tax liability associated with the difference between the ratable accelerated depreciation on AMR and the amount included in base rates.

5.4 Phase Two Cost Recovery

PECO proposes to recover the estimated Phase Two deployment costs identified in Appendix C, including a 10% return on equity as approved by the Commission in PECO's last base rate proceeding, through the SMCRS adopted in its Phase One Smart Meter case.

The estimated customer bill impact of Phases One and Two of PECO's Smart Meter Plan is summarized in Appendix D. The key cost components include:

- Incremental expenses associated with the new AMI system including network deployment, project management, IT system implementation and ongoing IT support costs;
- Annual depreciation expense on the new AMI System capital investments, as well as accelerated depreciation related to the early retirement of existing AMR assets and the associated tax impacts;
- A return on the AMI net investment reflecting PECO's capital structure with a 10% return on equity, the income taxes associated with the equity portion, and the flow through of the benefit of accelerated depreciation used in calculating state income taxes; and
- Cost savings associated with the avoidance of vendor fees that PECO currently pays for AMR meter reading services and operational efficiencies generated by the remote connect feature of the AMI meter technology.

The Phase Two cost projections presented in Appendix C are estimates and subject to change based on actual costs incurred. Additionally, changes in scope from the original Plan may be required to address added functionality capabilities and/or integration of the AMI infrastructure with PECO's existing IT systems or implementation of other capabilities or uses as directed by the Commission. PECO expects these changes will be incorporated into the Phase

Two work plan and the associated costs to be recovered through the SMCRS. Consistent with Phase One, PECO will continue to work to mitigate any and all potential costs risks through disciplined procurement processes, the effective testing of technologies, and optimized work processes. In addition, PECO will review any significant changes in cost or scope with stakeholders through the collaborative meeting process.

6. Miscellaneous Issues

6.1 Customer Communication

As part of its Smart Meter initiative, PECO is executing a robust, integrated internal and external communications strategy. The strategy has been developed based on industry best practices and key lessons learned – to improve satisfaction by educating customers and key stakeholders, generating awareness and promoting understanding. Prior to developing the plan, the Company conducted information sessions with more than a dozen other utilities, completed three in-depth employee focus groups and six extensive customer focus groups.

The campaign included the following internal communications:

- Creation of a dedicated cross-functional team of employees from across the organization to service as “Change Agents” or ambassadors to help educate employees on this important project. This team meets monthly to ensure good knowledge of the most up-to-date project information.
- Conducted regular Town Hall meetings and a variety of service locations for all employees to hear first hand from leadership, the project team and Change Agents.
- Regularly update employees through direct voicemails from executives and project leads.
- Developed comprehensive standard messaging to ensure employees were well equipped to respond to questions from customers, friends, family and neighbors.
- Provided easy to use PECO Points ring cards with important project messaging for field employee use when interacting with customers.
- Use of existing internal communication vehicles to keep employees informed (PECO Connection and Inside Exelon).

- Created dedicated Intranet page which could be updated quickly to serve as resource for all project messaging and information.

The following external communications were included in the campaign:

- Completed extensive media backgrounding sessions with all key reporters in advance of project to ensure a complete understanding of the project prior to needing to write about it.
- Developed comprehensive standard messaging.
- Created a customer-friendly project brochure.
- Created dedicated web page (peco.com/technology) which could be updated in real-time to serve as an information resource to customers. The web page was also enabled with a link to ask a question directly to a member of PECO's project team about the program.
- Completed an article in PECO's customer newsletters (energy@home / energy@work) to update customers about the project.
- Developed comprehensive outreach presentation for use as needed at local community events.

And finally, an aggressive customer communications campaign was launched to ensure customer awareness and engagement prior to meter installation. Specifically, customers will receive the following communications concerning their meter replacement:

- Direct letters at 45-days and 21-days in advance of meter replacement work.
- A proactive telephone call one week prior to installation.

- Upon arrival at a customer’s property, installers will knock on the customer’s door to answer any questions he/she may have if available.
- Customers also are left a door hanger at the completion of work.
- Customers with inaccessible meters also will receive a follow-up direct call to schedule an installation appointment.

6.2 Cyber Security

Cyber Security encompasses the identification, implementation and management of appropriate controls to ensure the confidentiality, integrity and availability of Smart Meter assets.

During Phase One, PECO retained a Black and Veatch as a consultant to help launch an ongoing security assessment for the Smart Meter program, which instilled confidence in the underlying AMI technology, including the ability to encrypt data. In concert with PECO’s Cyber Security Plan under its DOE SGIG program, PECO will continue its holistic, long-term security management approach for both Smart Meters and Smart Grid systems that incorporate appropriate controls including data privacy elements. For example, PECO has adopted a layered “defense-in-depth” strategy incorporating physical, platform, network, application, information and process controls. This strategy provides for an appropriate end-to-end security posture via numerous security controls applied to Smart Meter devices, systems, communications, users, applications and other critical infrastructure elements. Together these controls provide the ability to mitigate, detect and remediate threats to the entire Smart Meter infrastructure and include specific controls such as network segmentation and firewalls, end-to-end encryption, security monitoring and incident management, and other appropriate security controls.

In addition, PECO has implemented both security incident management and event monitoring processes for the Smart Meter environment that personnel must follow from initial

detection, response, reporting, and resolution through root cause analysis and final mitigation. PECO's incident response processes address the capability to continue or resume operations of Smart Meter assets in the event of disruption of normal Smart Meter system operations. PECO has documented and implemented specific procedures for incident handling from intrusion detection systems which forms a critical cyber security asset within the overall "defense-in-depth" strategy. PECO has also established a "Command Center" for Smart Meter operational support, including system monitoring, incident management, change control, and configuration management for the Smart Meter system.

6.3 Data Privacy

Data privacy encompasses the relationship between the collection and dissemination of information, as well as the practices, processes and technology associated with those activities, the public expectation of privacy, and the legal and political issues surrounding them. Privacy concerns exist wherever personally identifiable information is collected and stored, in digital form or otherwise.

PECO's Smart Meter infrastructure protects customer-identifying information (*e.g.*, home addresses) in several respects. First, such information is not stored in the two-way communicating meters or communicated across the AMI network. Second, energy usage data collected by Smart Meters is encrypted and protected with the same methods as online banking and ATM machines. Third, these data are transmitted to PECO via a secure network that complies with the industry's best practices for data privacy. This approach incorporates an in-depth layered security strategy across the entire system to protect customer data and preserve the reliability of the electric distribution system. Because of the importance of cyber security and data privacy issues, PECO has held several stakeholder meetings specifically to discuss the

safeguarding of Smart Meter data. Some of the key issues that have surfaced for continuing discussion include:

- Ensuring privacy protection for victims of domestic violence and other related crimes
- Security controls for information storage, transmission and sharing
- Customer education regarding their privacy rights
- Procedures for customer consent

PECO protects the privacy of customer data in compliance with all existing statutes and laws. If the Commission were to decide that a more formal process might be called for, the Company suggests that the Commission consider initiating a statewide proceeding to examine these and other issues surrounding smart meter data security and privacy. As current regulations were written with monthly meter read data in mind, the PUC should consider the increased sensitivity with interval data provided by the Smart Meter. The Commission and stakeholders might consider using the best practices developed by the North American Energy Standards Board (NAESB) as a starting point in their discussions.

6.4 Smart Meter Opt-in Process

The Implementation Order requires PECO to furnish Smart Meters to customers upon their request after the expiration of the 30-month grace period and prior to scheduled universal deployment in their areas. As part of its Phase One Smart meter filing, PECO submitted, and the Commission approved, the appropriate tariff provisions needed to address such requests. While PECO therefore expects to comply with the opt-in requirement, it nonetheless requests the ability to petition the Commission for a waiver to suspend this requirement if opt-in requests reach a

level that would negatively impact the synergies associated with PECO's proposed accelerated universal deployment plan.

This request is based on the expected impact of the accelerated deployment plan on workforce availability. The proposed Phase Two deployment will include a very orderly, planned deployment with focused contractor and PECO work forces executing efficient installation processes. Inefficiencies associated with a significant level of ad hoc opt-in requests could create significant disruptions in both the physical installation and the network operation processes, causing PECO to incur unreasonable travel and logistics costs. Moreover, because PECO is committing to deploy Smart Meters to all its customers within 26 months of the end of the grace period, customers who desire a Smart Meter will receive one within a reasonable period of time, even if the Company is required to suspend the opt-in process.

At the time of this filing, opt-in requests have been minimal and PECO completed its first opt-in install on January 9, 2013.

6.5 Cost Recovery for Meter Events

As described in detail in Section 3.2, PECO has undertaken significant corrective and preventive action in response to the meter events experienced during 2012, and has incurred costs associated with those actions. To date, PECO has purchased approximately 324,000 Sensus meters at a total cost of approximately \$29 million, with an original value of \$15 million (net of \$14 million of DOE reimbursement). PECO has incurred approximately \$6 million of installation costs for the Sensus meters, with an original value of \$4 million (net of \$2 million of DOE reimbursement). Accordingly, PECO will defer the costs it has incurred and the costs it may continue to incur related to the 2012 meter events while it works to resolve issues related to



cost responsibility with its meter vendor. PECO intends to have customers receive the full benefit of DOE reimbursements received under the SGIG, as PECO has previously committed. Similarly, PECO intends to reflect the amount it recovers from its meter vendor as a reduction to the costs it is deferring. When a resolution acceptable to PECO has been achieved with its meter vendor, PECO will seek Commission approval to fully recover any remaining deferred costs through its currently authorized Smart Meter Recovery Surcharge. In any event, PECO will not seek a return on the deferred meter-event costs.



7. Appendices



Appendix A

Smart Meter Project Costs

(Current vs. Original Estimate as of January 18, 2013)

(\$'s in Millions)	PHASE ONE		PHASE TWO		TOTAL PROJECT	
	Original Estimate	Latest Estimate	Original Estimate	Latest Estimate	Original Estimate	Latest Estimate
AMI Deployment:						
Meters and Installation	\$ 92	\$ 105	\$ 179	\$ 213	\$ 271	\$ 318 ^(a)
Network Communication System	53	44	-	-	53	44 ^(b)
Project Management	10	32	28	30	38	61 ^(c)
Total AMI Deployment	155	181	208	242	363	423
DOE Compliance	10	7	-	-	10	7
IT Applications and Support	122	118	42	40	164	158 ^(d)
Customer Programs	13	7	-	-	13	7 ^(e)
Total Smart Meter Costs	\$ 300	\$ 313	\$ 250	\$ 282	\$ 550	\$ 595 ^(f)
Recovery from DOE	(143)	(139)	-	(2)	(143)	(141) ^(g)
Total Net Smart Meter Costs	\$ 157	\$ 175	\$ 250	\$ 280	\$ 407	\$ 455

Notes:

- ^(a) Increased meter pricing
- ^(b) Reduced scope of Tier 2
- ^(c) Increased AMI deployment resources
- ^(d) Latest estimate includes AFUDC of \$3M in Phase One and \$2M in Phase Two
- ^(e) Revised estimate per PECO's Supplemental Dynamic Pricing Plan approved by PUC in September, 2012
- ^(f) Latest estimate excludes costs to be deferred for meter events as described in Section 6.5 of this Plan
- ^(g) Reflects DOE Stimulus Grant (SGIG) matching funds

Appendix B:

Summary of Stakeholder Collaborative Meetings

No.	Date	Event	Key Discussion Topics
1	9/22/2009	Stakeholder Collaborative	<ul style="list-style-type: none"> • Discuss Smart Meter Collaborative meeting process
2	10/7/2009	Technical Conference (PUC Briefing)	<ul style="list-style-type: none"> • Smart Meter Plan Overview • DOE Stimulus fund application overview
3	10/7/2009	Stakeholder Collaborative	<ul style="list-style-type: none"> • Follow-up from PUC Technical Conference • Smart Meter IT Plan and sourcing overview • AMI sourcing overview • Customer testing and pricing programs
4	11/4/2009	Stakeholder Collaborative	<ul style="list-style-type: none"> • Stimulus update • Settlement discussion • Sourcing update • Customer testing and pricing programs update
5	12/3/2009	Stakeholder Collaborative	<ul style="list-style-type: none"> • Stimulus update • Project updates: Sourcing, IT • Customer testing and Dynamic Pricing Programs design update
6	1/13/2010	Stakeholder Collaborative	<ul style="list-style-type: none"> • Stimulus update • Project updates: Sourcing, IT • Review of 2009 Smart Meter expenditures • Customer testing and Dynamic Pricing Programs design update
7	2/26/2010	Stakeholder Collaborative	<ul style="list-style-type: none"> • Stimulus update • Sourcing update • Customer testing and Dynamic Pricing Programs design update
8	4/27/2010	Stakeholder Collaborative	<ul style="list-style-type: none"> • Project updates: Sourcing, IT • Dynamic Pricing programs • Review of Smart Meter project expenditures to date
9	8/12/2010	Stakeholder Collaborative	<ul style="list-style-type: none"> • Sourcing update • Vendor overview of network and meters (Sensus USA, Inc.) • Vendor justification overview • Program Management Organization overview • Budget overview and cost recovery update • Dynamic Pricing Program recommendation
10	2/10/2011	Stakeholder Collaborative	<ul style="list-style-type: none"> • Update on key milestones and success factors • Project updates: Sourcing, AMI deployment, Smart Grid, IT, Budget • DOE compliance reporting • Dynamic Pricing Program update • Cost recovery update
11	3/29/2011	PUC Briefing	<ul style="list-style-type: none"> • Update on key milestones and success factors • Project updates: Sourcing, AMI deployment, Smart Grid, IT, Budget • DOE compliance reporting & cost reimbursement update • Dynamic Pricing Program update • Cost recovery update

No.	Date	Event	Key Discussion Topics
12/13	6/17/2011	PECO On-site Meter Shop Tour (Combined Stakeholders and PUC Staff)	<ul style="list-style-type: none"> • AMI station tour at PECO’s Berwyn complex • AMI network and meter deployment updates • Paoli, PA tower gateway base-station site visit
14	11/17/2011	Stakeholder Collaborative	<ul style="list-style-type: none"> • Update on key milestones and success factors • Project updates: AMI deployment, Sourcing/Contracts, Budget Overview, Smart Grid, IT Systems, Data Security/Privacy, Dynamic Pricing Program, Partnerships, Cost Recovery • Future Meeting Topics/Next Steps
15	3/6/2012	PUC Briefing	<ul style="list-style-type: none"> • Update on key milestones and success factors • Project updates: Meter deployment, Smart Grid, IT, Budget, Dynamic Pricing Program, Data privacy, Partnerships • Low Income project - Customer Survey results
16	3/6/2012	Stakeholder Collaborative	<ul style="list-style-type: none"> • Update on key milestones and success factors • Project updates: Meter deployment, Smart Grid, IT, Budget, Dynamic Pricing Program, Data privacy, Partnerships • Low Income project – Customer Survey results
17	6/13/2012	PUC Briefing	<ul style="list-style-type: none"> • Project updates • Preview of Phase Two universal deployment filing • Remote Connect Disconnect (RCD) pilot
18	6/13/2012	Stakeholder Collaborative	<ul style="list-style-type: none"> • Project updates • Preview of Phase Two universal deployment filing • Remote Connect Disconnect (RCD) pilot
19	9/13/2012	PUC Briefing	<ul style="list-style-type: none"> • Summary of AMI events and corrective actions taken
20	10/23/2012	Stakeholder Collaborative	<ul style="list-style-type: none"> • Project updates • Preview of Phase Two universal deployment filing • Update on RCD pilot • Update on Web presentment
21	12/10/12	PUC Briefing	<ul style="list-style-type: none"> • AMI deployment update • Replacement of Sensus meters • Current cost estimates • RCD benefits and pilot results • Web presentment of meter data • Smart Grid update

Appendix C:

Estimated Cost-Benefit Analysis for Phase Two Smart Meter Deployment (\$M as of January 18, 2013)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Phase Two Costs:											
AMI Deployment		\$ (111.7)	\$ (130.6)	\$ (0.2)							\$ (242.4)
IT Enablement	\$ (0.4)	\$ (17.9)	\$ (15.6)	\$ (0.1)							\$ (34.0)
Business Integration	\$ (0.1)	\$ (3.3)	\$ (2.2)								\$ (5.7)
Total Phase Two Costs	\$ (0.6)	\$ (132.9)	\$ (148.3)	\$ (0.3)							\$ (282.1)
Benefits:											
Avoided AMR Costs	\$ 0.7	\$ 4.8	\$ 16.2	\$ 30.2	\$ 32.3	\$ 32.3	\$ 32.3	\$ 32.3	\$ 32.3	\$ 32.3	\$ 245.4
PECO Operational Savings		\$ 1.1	\$ 4.3	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 6.9	\$ 53.5
Customer (Societal) Benefits*		\$ 0.8	\$ 2.0	\$ 3.4	\$ 6.1	\$ 6.1	\$ 6.1	\$ 6.1	\$ 6.1	\$ 6.1	\$ 42.8
Total Benefits	\$ 0.7	\$ 6.8	\$ 22.4	\$ 40.5	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 341.8
Net (Cost) - Benefit	\$ 0.1	\$ (126.1)	\$ (125.9)	\$ 40.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 45.2	\$ 59.7
NPV_{7,0} of (Costs) - Benefits											\$ (17.7)

Alternative Phase Two Plan - (Proportionate Completion of Entire Service Territory by end of 2019)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Phase Two Costs:											
AMI Deployment		\$ (27.7)	\$ (41.9)	\$ (40.4)	\$ (40.4)	\$ (40.4)	\$ (40.5)	\$ (21.4)			\$ (252.6)
IT Enablement	\$ (0.4)	\$ (9.4)	\$ (9.8)	\$ (17.1)	\$ (2.1)						\$ (38.9)
Business Integration	\$ (0.1)	\$ (3.3)	\$ (2.2)								\$ (5.7)
Total Phase Two Costs	\$ (0.6)	\$ (40.5)	\$ (53.9)	\$ (57.4)	\$ (42.5)	\$ (40.4)	\$ (40.5)	\$ (21.4)			\$ (297.1)
Benefits:											
Avoided AMR Costs	\$ 0.7	\$ 4.8	\$ 8.0	\$ 11.2	\$ 14.4	\$ 17.6	\$ 20.8	\$ 23.9	\$ 32.3	\$ 32.3	\$ 165.9
PECO Operational Savings		\$ 0.5	\$ 1.3	\$ 2.1	\$ 3.0	\$ 3.8	\$ 4.7	\$ 5.8	\$ 6.9	\$ 6.9	\$ 35.0
Customer (Societal) Benefits		\$ 0.3	\$ 1.0	\$ 1.8	\$ 2.6	\$ 3.4	\$ 4.2	\$ 5.2	\$ 6.1	\$ 6.1	\$ 30.7
Total Project Benefits	\$ 0.7	\$ 5.5	\$ 10.3	\$ 15.1	\$ 20.0	\$ 24.8	\$ 29.7	\$ 34.9	\$ 45.2	\$ 45.2	\$ 231.5
Net (Cost) - Benefit	\$ 0.1	\$ (34.9)	\$ (43.6)	\$ (42.3)	\$ (22.5)	\$ (15.7)	\$ (10.8)	\$ 13.6	\$ 45.2	\$ 45.2	\$ (65.6)
NPV_{7,0} of (Costs) - Benefits											\$ (75.9)

* Societal benefits are not included in revenue requirement estimates shown in Appendix D.

Appendix D:

Estimated Smart Meter Cost Recovery (\$M as of January 18, 2013) ¹

(\$ millions)	2012 ²	2013	2014	2015	2016	2017	2018	2019	2020	2021
Prior Period (Over)/Under Collection	\$ 2.2	\$ (9.4)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
O&M Expenses	16.4	27.3	31.9	29.7	29.5	30.0	30.9	31.8	32.8	33.8
Depreciation (incl. Accelerated AMR)	10.2	18.2	32.8	39.3	37.1	34.1	29.9	28.5	27.5	26.2
Capital Revenue Requirement ³	10.5	11.6	27.4	32.9	30.6	28.2	31.6	32.5	31.5	28.6
Benefits and Avoided Costs	(0.9)	(5.9)	(20.4)	(37.1)	(39.1)	(39.1)	(39.1)	(39.1)	(39.1)	(39.1)
Revenue Requirement	\$ 38.4	\$ 41.9	\$ 71.7	\$ 64.9	\$ 58.1	\$ 53.2	\$ 53.3	\$ 53.7	\$ 52.6	\$ 49.4
Breakdown by Customer Class:										
R	36.6	38.0	64.8	58.6	52.5	48.0	48.1	48.5	47.5	44.7
SCI	4.0	3.8	6.8	6.1	5.5	5.0	5.0	5.1	5.0	4.7
LCI	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	\$ 40.7	\$ 41.9	\$ 71.7	\$ 64.9	\$ 58.1	\$ 53.2	\$ 53.3	\$ 53.7	\$ 52.6	\$ 49.4
Estimated Surcharge Rates ⁴:										
R - (¢/kWh)	0.28	0.31	0.52	0.46	0.41	0.38	0.38	0.38	0.37	0.35
SCI - (\$/cust./mo.)	\$ 2.16	\$ 2.27	\$ 4.02	\$ 3.62	\$ 3.23	\$ 2.95	\$ 2.94	\$ 2.95	\$ 2.88	\$ 2.70
LCI - (\$/cust./mo.)	\$ 2.15	\$ 2.65	\$ 4.02	\$ 3.62	\$ 3.23	\$ 2.94	\$ 2.94	\$ 2.95	\$ 2.88	\$ 2.70
Avg. Customer Monthly Bill Impact:										
R - 500 kWh	\$ 1.38	\$ 1.53	\$ 2.58	\$ 2.31	\$ 2.06	\$ 1.88	\$ 1.89	\$ 1.90	\$ 1.86	\$ 1.75
SCI	\$ 2.16	\$ 2.27	\$ 4.02	\$ 3.62	\$ 3.23	\$ 2.95	\$ 2.94	\$ 2.95	\$ 2.88	\$ 2.70
LCI	\$ 2.15	\$ 2.65	\$ 4.02	\$ 3.62	\$ 3.23	\$ 2.94	\$ 2.94	\$ 2.95	\$ 2.88	\$ 2.70
Avg. Customer Annual Bill Impact:										
R - 500 kWh	\$ 16.60	\$ 18.30	\$ 30.99	\$ 27.77	\$ 24.70	\$ 22.60	\$ 22.63	\$ 22.80	\$ 22.33	\$ 20.99
SCI	\$ 25.86	\$ 27.28	\$ 48.23	\$ 43.48	\$ 38.77	\$ 35.35	\$ 35.26	\$ 35.40	\$ 34.54	\$ 32.36
LCI	\$ 25.80	\$ 31.84	\$ 48.19	\$ 43.43	\$ 38.73	\$ 35.31	\$ 35.26	\$ 35.40	\$ 34.54	\$ 32.36
Percent Impact on Total Customer Bill:										
R - 500 kWh	1.5%	1.9%	3.2%	2.8%	2.5%	2.3%	2.3%	2.3%	2.3%	2.1%
SCI	0.2%	0.2%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.2%
LCI	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%

¹ Cost recovery estimates include Phase One + Phase Two costs and are net of Stimulus Grant Funding at approximately 48% of Gross Plant consistent with DOE Grant awarded to PECO (award No. DE-OE0000207).

² Reflects calculation for SMCRS estimates for the period January 1, 2012 to December 31, 2012 as filed with the PUC on Dec. 15, 2011.

³ Reflects a 10% return on equity.

⁴ Rates include impact of Gross Receipts Tax (GRT) of 5.9%.

Appendix E:

Estimated State Tax Flow Through Impact from Accelerated AMR Depreciation * (\$M as of January 18, 2013)

	Actual Book Depreciation (1)	Recovered in Base Rates (2)	Accelerated Depreciation Under the Settlement Recovery over 10 yrs (3)	Tax Depreciation from Acceleration ¹ (4)	Net Additional Book/Tax due to Acceleration (5) = (3) - (4)	Additional State Income Tax @6.5% (6) = (5) * 6.5%	Revenue Requirement (7) = (6)/(1-T/(1-GRT))
2010	\$ 10.9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2011	\$ 25.4	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2012	\$ 29.1	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2013	\$ 36.2	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2014	\$ 8.7	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2015	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2016	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2017	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2018	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2019	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
2020	\$ -	\$ 10.0	\$ 1.0	\$ (0.4)	\$ 1.4	\$ 0.1	\$ 0.2
Total	\$ 110.3	\$ 100.5	\$ 9.8	\$ (4.4)	\$ 14.2	\$ 0.9	\$ 1.7

¹ Amortization of tax depreciation from acceleration (as shown in column 4 above) is developed as shown in the following table:

	Tax Depreciation Under Accelerated Depreciation	Tax Depreciation Included in Base Rates	Difference
2010	\$ 5.7	\$ 4.7	\$ 1.0
2011	\$ 7.0	\$ 4.7	\$ 2.3
2012	\$ 8.8	\$ 4.7	\$ 4.1
2013	\$ 13.6	\$ 4.7	\$ 8.8
2014	\$ 12.3	\$ 4.7	\$ 7.6
2015	\$ -	\$ 4.7	\$ (4.7)
2016	\$ -	\$ 4.7	\$ (4.7)
2017	\$ -	\$ 4.7	\$ (4.7)
2018	\$ -	\$ 4.7	\$ (4.7)
2019	\$ -	\$ 4.7	\$ (4.7)
2020	\$ -	\$ 4.7	\$ (4.7)
Total	\$ 47.3	\$ 51.8	\$ (4.4)
	Amortized over 10 years =		\$ (0.4)

* Note: All figures shown in Appendix E are latest estimates and are for illustrative purposes only.