

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Smart Meter Procurement and Installation Plans** : **Docket No. M-2009-2092655**  
:

**COMMENTS OF PECO ENERGY COMPANY  
ON STAFF'S DRAFT IMPLEMENTATION ORDER AND QUESTIONS  
REGARDING SMART METER PROCUREMENT AND INSTALLATION PLANS**

**INTRODUCTION**

Pursuant to the March 30 and April 9, 2009 Secretarial Letters issued in this docket, requesting comments on Staff's draft Implementation Order for Act 129 smart meter procurement and installation plans (the "Draft Order") and responses to Staff's smart meter questions, PECO Energy Company ("PECO") hereby submits its comments on the Draft Order and responds to Staff's questions.

**I. EXECUTIVE SUMMARY**

PECO is pleased to comment on Staff's Draft Order and to provide answers to Staff's questions concerning smart meter procurement and installation. Indeed, PECO has already implemented a fixed-network automated meter reading ("AMR") system throughout its service territory that provides many benefits to its customers. PECO looks forward to leveraging its decade of experience with its AMR system as it works with the Commission, Staff, and interested stakeholders to develop a prudent and cost-effective smart meter network.

PECO supports and appreciates Staff's efforts to develop smart meter rules consistent with Act 129 (the "Act"). To accomplish this outcome, PECO believes that the goals of this rulemaking should be to enable electric distribution companies ("EDCs") to meet today's meter functionality requirements set forth in the Act and to provide EDCs with the flexibility to meet tomorrow's consumer energy and technology needs. Consequently, PECO's comments are

guided by several key principles, provided below, that are both consistent with the Act's smart meter procurement and installation provisions and with its requirement that the costs incurred as part of an EDC's smart meter plan be "reasonable and prudent."<sup>1</sup> It is critical that Staff consider these principles as they further develop the Draft Order.

First, *Act 129's smart meter requirements should be the polestar for the Commission's smart meter procurement and installation rules.* The Act sets forth the General Assembly's intent with respect to smart meter procurement and installation plans, and the Commission's rules should reflect the Act's language and intent. During the course of this proceeding, the Commission may be presented with, and requested to require EDCs to implement, "next generation" applications and anticipated technologies. These technologies are still evolving and some are not yet ready for wide-scale deployment. Other emerging technologies may be suitable for some customers but not all. Therefore, the Commission's focus should be on complying with the Act's smart meter functionality and rate requirements while allowing EDCs and third parties the flexibility to provide customers with additional smart meter tools where appropriate.

Second, *smart meter protocols and standards should be developed collaboratively with the industry.* Technology protocols and standards are rapidly developing. In this evolving environment, the meter manufacturing community, EDCs, industry stakeholders and the government have demonstrated an ability to reach consensus standards to create usable metering tools. In fact, the National Institute of Standards and Technology ("NIST"), the Electric Power Research Institute ("EPRI"), and interested stakeholders are currently working together to develop smart grid interoperability standards and protocols.<sup>2</sup> Accordingly, the Commission

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<sup>1</sup> 66 Pa. C.S. § 2807(f)(7).

<sup>2</sup> See, EPRI To Facilitate Development of Smart Grid Roadmap, *Renewable Energy World.com*, April 13, 2009 <http://www.renewableenergyworld.com/rea/news/article/2009/04/epri-to-facilitate-development-of-smart-grid-roadmap?src=rss>

should not mandate Pennsylvania-specific protocols or standards, but should facilitate the continued evolution of standards through collaborative processes. This does not preclude Commission involvement in such processes. Indeed, the Commission's existing Electronic Data Exchange Working Group ("EDEWG") is just one example of a forum in which the industry, stakeholders, and Staff can work together on these issues.

Third, ***in implementing smart meter technology, the Commission and EDCs should be mindful of network security and management risks.*** The secure operation of the electricity grid in the Commonwealth is critical for Pennsylvania's residents and for the residents of other states who depend on the continuous movement of electricity in this region. Threats by hackers to the nation's electricity grid are a growing concern and reality.<sup>3</sup> In addition, unrestrained public access to EDC information networks can negatively affect their reliability. The number of users connected to an information network, the applications and databases they are attempting to use, and the unintentional transfer of viruses, can adversely impact a network. Therefore, while the Commission's rules should allow for the provision of ***smart meter data*** consistent with the Act, they should not mandate that EDCs provide unrestricted access to their ***core smart metering network***.

Fourth, as Staff has correctly recognized, ***a fully functional smart meter involves more than just the meter hardware attached to the customer's premises.*** An EDC's Act 129 smart meter plan will require, in addition to the meter, a backbone network, a Meter Data Management System ("MDMS"), information processing hardware and software, and personnel to support and maintain the smart meter network. A smart meter is only as good as the network supporting it,

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<sup>3</sup> See, e.g., Electricity Grid in U.S. Penetrated By Spies, *The Wall Street Journal*, April 8, 2009; <http://online.wsj.com/article/SB123914805204099085.html>

and there will be substantial costs associated with implementing a network that will meet Act 129's smart meter requirements.

Finally, *appropriate incentives will be critical to accelerating smart meter deployment ahead of the Act's required deployment period.* As noted above, PECO has already implemented advanced meters throughout its service territory, and continues to replace and upgrade those meters as necessary. Several EDCs have also implemented advanced meter technologies in their service territories. Many of these meters will not reach the end of their useful lives for several years. Therefore, the Commission will need to provide incentives such as recovery of accelerated depreciation of these assets and cost recovery for meter projects that are already underway to spur the deployment of smart meters more rapidly.

PECO's comments are organized as follows. First, PECO provides comments on the Draft Order. Second, in Attachment "A" hereto, PECO provides redlined comments on the Draft Order. Third, in Attachment B hereto, PECO responds to Staff's technical questions.

## **II. PECO'S COMMENTS ON STAFF'S DRAFT IMPLEMENTATION ORDER**

### **A. Plan Approval Process**

#### **PECO's Comment**

PECO believes that Staff's plan approval process set forth on pages 4-5 of the Draft Order is appropriate, with one exception. The proposed process appears to contemplate that an Administrative Law Judge's Initial Decision will be needed for every plan filing. This may not be the case.

It is possible that no comments will be filed on an EDC's plan, or that the filed comments will support the plan or request only limited revisions. Indeed, if an EDC conducts stakeholder meetings in advance of filing its plan, as PECO and some other EDCs have done in preparation

for filing their Energy Efficiency and Conservation plans, it is possible that many stakeholder issues will be addressed before the EDC's smart meter plan is filed.<sup>4</sup> Also, issues arising with respect to the EDC's plan are likely to primarily involve technology issues, as opposed to legal issues. Therefore, these issues may be resolved by settlement early in the plan proceeding.

Accordingly, if no comments are filed on the EDC's smart meter plan, or if comments are filed in support of the plan or all issues pertaining to the plan are settled, PECO proposes that the technical conference envisioned by the Draft Order be held before the presiding ALJ for the Commission's record. Following the technical conference, the EDC (and, if applicable, the parties) should be permitted to certify the record to the Commission for a decision on the EDC's smart meter plan pursuant to 52 Pa. Code § 5.531(a).<sup>5</sup>

PECO believes that explicitly referencing this process as an option in the Draft Order is in the public interest, as it may ultimately enable the provisioning of smart meter technology to consumers more quickly and at the same time conserve administrative hearing resources. Accordingly, PECO respectfully requests that the Commission adopt its alternative language regarding the Plan Approval process as set forth in Attachment A hereto.

## **B. Smart Meter Deployment**

### **1. Network Development and Installation Grace Period**

#### **PECO's Comment**

PECO again commends Staff for recognizing that "a fully functional smart meter involves more than just the meter hardware attached to the customer's premises."<sup>6</sup> This is a

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<sup>4</sup> While this view may be optimistic, to paraphrase a great English Poet, "hope springs eternal." Alexander Pope.

<sup>5</sup> "If a proceeding is referred to a presiding officer, that officer will normally file a decision. The record will be certified to the Commission without a decision of the presiding officer only as required or allowed by the Commission."

<sup>6</sup> Draft Order at 4.

critical principle that cannot be over emphasized. In addition, PECO appreciates Staff's proposal to permit EDCs an 18-month network development and installation grace period following plan approval. However, PECO has several comments with respect to this section of the Draft Order that are intended to better track the language of the Act and the realities of acquiring and deploying a fully functional smart meter network.

First, Staff should note that before EDCs can develop and install a smart meter network, several steps and processes must be completed. Requests for Information and Requests for Proposals must be issued. Vendors and equipment must be evaluated and selected. Delivery schedules will need to be agreed upon. Contracts will need to be negotiated, signed and approved by the Commission. In addition, EDCs may need to conduct factory acceptance testing to ensure that a larger deployment will be successful.

Moreover, with many EDCs (and out-of-state electric companies) purchasing smart meters and network equipment at the same time, manufacturing and delivery times may, of necessity, be scheduled to occur significantly after a contract is signed. For example, as demand for renewable energy and energy efficiency technologies have rapidly risen in recent years, there have been significant shortages and delays in the production of wind turbines and hybrid batteries. The Commission should contemplate that similar issues may arise as demand for smart meter technology becomes more prevalent.

Accordingly, PECO recommends that the 18-month grace period be tied to the Commission's approval of an EDC's negotiated contracts with smart meter equipment vendors,

which will follow the Commission’s approval of the EDC’s plan. This will enable the EDC to reach an agreement with smart meter equipment vendors as to when the equipment can be supplied and installed.<sup>7</sup>

Second, the Draft Order proposes that EDCs be required to “provide interval meters, *if necessary*, and direct access to customer meters to third-parties, such as EGSs or CSPs, upon customer request.”<sup>8</sup> As a threshold matter, Act 129 does not require the installation of interval meters. It appears that Staff’s intent in requiring EDCs to provide interval meters during the grace period is to provide customers with an interim form of smart meter technology. While PECO understands Staff’s objective, PECO cautions Staff that there are costs and security issues that must be considered with respect to this proposal, which are not specifically addressed in the Draft Order.

PECO notes that Staff correctly recognizes, by the inclusion of the phrase “if necessary” in the above-referenced language, that it may not be necessary for all EDCs to provide interval meters to their customers in order to provide them with interval data. In fact, PECO’s current AMR system is to a large degree capable of providing customers interval data with the addition of certain information collection by PECO’s vendor. PECO does not read the Draft Order’s language to require the removal of AMR meters capable of delivering interval data. Indeed, Staff’s recognition that “deployment of smart meters on a piecemeal or individual basis could

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<sup>7</sup> PECO also notes that on April 16, 2009, the Commission ordered an investigation into the requirements of Section 410(a) of the American Recovery and Reinvestment Act of 2009 (“ARRA”), which section discusses the allocation of financial resources to the State Energy Program. The investigation into the requirements of Section 410(a) may include discussions about EDC compliance with Act 129 and how to effectively utilize ARRA funds to that end, if appropriate. PECO suggests that there should be harmony between the timeline for Act 129 smart-meter compliance and the investigation process for ARRA Section 410(a) expenditures.

<sup>8</sup> *Id.* (emphasis added).

involve greater costs than a system-wide deployment”<sup>9</sup> applies even more so to the replacement AMR meters with interval meters.

PECO also notes that the Draft Order does not make clear that the EDC’s provision of interval data, or an interval meter if necessary, is contingent upon the customer’s agreement to pay the cost of the interval data or meter. EDCs will incur costs to supply interval data or meters to customers during the grace period. The General Assembly clearly intended that customers requesting new smart meter technology in advance of the EDC’s system-wide smart meter deployment must pay the cost of the technology.<sup>10</sup> The Draft Order should make it clear that the customer will be required to pay the associated interval data/meter costs.

Finally, this section of the Draft Order also requires that EDCs provide direct access to interval meters to third parties such as EGSs or CSPs.<sup>11</sup> PECO does not oppose providing interval *data* to third parties. In fact, PECO already provides interval data for large commercial and industrial customers to third parties if the customer requests it to provide this data. However, the Act does not require that EDCs provide customers with interval meters. Therefore, it also does not require that EDCs provide direct access to *interval meters* to third parties. Indeed, PECO has a serious concern that such access could negatively impact the security and reliability of its current meters and meter network. Accordingly, the Draft Order should limit its proposed requirement on this issue to third party access to interval data. The Draft Order should not require EDCs to give access to third parties to their interval meters. PECO has included proposed language in its Attachment A to address the foregoing issues.

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<sup>9</sup> *Id.* at 5.

<sup>10</sup> See 66 Pa. C.S. § 2807(f)(2)(I) (“Electric distribution companies shall furnish smart meter technology as follows . . . (I) Upon request from a customer that agrees to pay the cost of the smart meter at the time of the request.”).

<sup>11</sup> *Id.* at 4.

## **2. Customer Request**

Subject to its previous comments, PECO has no comments on this section of the Draft Order. If necessary, PECO will address the comments of other parties on this section in its Reply Comments.

## **3. New Construction**

### **PECO's Comment**

Subject to its previous comments, PECO has no comments on this section of the Draft Order. If necessary, PECO will address the comments of other parties on this section in its Reply Comments.

## **4. System-Wide Deployment**

### **PECO's Comment**

PECO agrees with this section's recognition that "it is crucial for the EDCs to develop a plan that will best meet the needs of their service territory, while at the same time operating in a manner that is both cost and time effective."<sup>12</sup> PECO commends Staff for recognizing that a "one-size fits all" approach to smart meter deployment is not the best way to provide smart meters in a timely and cost effective manner. PECO also commends Staff for encouraging expedited deployment of smart meters. However, as PECO noted in its guiding principles, appropriate incentives will be critical to accelerating smart meter deployment.

PECO and many other EDCs have upgraded their meters and meter systems over the years and continue to do so. Much of this equipment is either new or has not been fully depreciated. Moreover, many EDCs may be in the middle of contract terms with respect to current meter equipment that may impact their ability to meet and accelerate the Act's goals.

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<sup>12</sup> *Id.* at 7.

Staff's statement that "if a meter is replaced prior to the end of its useful life, the EDC will not be able to take advantage of the full depreciation of that meter" is an appropriate recognition of these issues.<sup>13</sup> Consistent with this recognition, the Commission will need to provide incentives to EDCs such as recovery of accelerated depreciation of assets and cost recovery for the early conclusion of current projects to promote the deployment of smart meters in accordance with, as well as more rapidly than, the Act's requirements.

### **C. Smart Meter Capabilities**

#### **PECO's Comment**

As PECO stated in its guiding principles, Act 129's smart meter provisions should be the foundation for the Commission's smart meter procurement and installation rules. While PECO supports the goal of exploring the possibilities of smart meters, the Commission's order should focus on proven technologies that will be useful to the customer classes to whom the technologies are being provided. This is not to say that EDCs and/or third parties should not be permitted to provide additional, optional functionalities to customers who want them.

This is consistent with the Act's requirement and the Draft Order's recognition that smart meter benefits must be prudent and cost-effective. In this regard, PECO notes that two of the Draft Order's proposed additional smart meter "capabilities" are neither practical nor cost effective, and therefore recommends that they be removed from the Draft Order.

First, the proposal that smart meters must have the "[a]bility to provide 15-minute or shorter interval data to customers, EGSs, third-parties and the Regional Transmission Organization" should be removed from the Draft Order.<sup>14</sup> Collecting 15-minute or shorter data

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<sup>13</sup> *Id.* at 6.

<sup>14</sup> *Id.* at 9, Item No. 3.

for all customers is not practical or useful for the vast majority of residential and small commercial customers. Mandating the collection of this data for these customers may result in significantly increased data management costs with no commensurate benefit. Moreover, the Act requires that EDCs provide customers with information on their hourly consumption.<sup>15</sup> Given these factors, PECO recommends that if the Commission believes it is necessary to establish minimum interval standards at this time, it should adopt an hourly interval data standard for residential and small commercial customers and a 15-minute interval data standard for large commercial and industrial customers. PECO recognizes that the marketplace and customer choices may drive the provision of interval data to shorter timeframes, but the Commission should not require shorter intervals.

Second, the Draft Order proposes to require that hourly reads be delivered to customers “at least once per day.”<sup>16</sup> While all major smart metering solutions *collect* information from the meter on at least a daily basis, collection of the data from the meter is only the first step in the data process. The data must then be aggregated in the smart meter collection system head-end for transmission to the MDMS, where it is preprocessed and then validated, edited and estimated. Currently, this type of information cannot be provided on a same-day basis. Accordingly, PECO believes that the same-day provision of this information by EDCs should not be a Commission-mandated requirement. Instead, provisioning of this data should be provided as available through individual technical solutions offered by the meter vendor community and selected by the EDC.

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<sup>15</sup> 66 Pa. C.S. § 2807(g)(1).

<sup>16</sup> *Id.* at 9, Item No. 4.

## **D. Access to Smart Meters and Data**

### **PECO's Comment**

As PECO also noted above, there are security and reliability issues surrounding third party access to EDC meters and, as a result, to EDC networks. Network access may also implicate competition issues. As currently drafted, this section of the Draft Order appears to envision virtually unrestricted access by third parties to EDC smart meters.<sup>17</sup> PECO believes that such an interpretation of the Act would cause a result that “is absurd, impossible of execution or unreasonable.”<sup>18</sup> Therefore, PECO recommends that a technical working group be established by the Commission to define and address smart meter access, security and reliability issues.

With regard to the Draft Order’s proposal that the Commission’s EDEWG address “formats for electronic data communications with customers and third-parties” PECO agrees with this recommendation.<sup>19</sup> The Draft Order should also direct EDEWG to monitor NIST’s development of smart meter protocols and standards. Finally, the Draft Order should direct EDEWG to work closely with the smart meter access and security technical working group to ensure that both groups develop consistent and workable solutions for the Commission’s consideration.

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<sup>17</sup> See, e.g., Draft Order at 10, proposing that EDCs provide “[o]pen, non-proprietary two-way access for electric suppliers and third-parties” to smart meters.

<sup>18</sup> 1 Pa. C.S. § 1922(1); see also Draft Order at 5 (citing this statute).

<sup>19</sup> Draft Order at 10-11.

## **E. EDC Cost Recovery**

### **1. Cost Recovery Mechanism**

#### **PECO's Comment**

In this section, the Draft Order states that “[a]n EDC may recover smart meter technology costs through (1) base rates, including a deferral for future base rate recovery of current basis with a carrying charge as determined by the Commission; *or* (2) on a full and current basis through a reconcilable automatic adjustment clause under section 1307.”<sup>20</sup> PECO does not read this language, or the language in section 2807(f)(7) of the Act as being mutually exclusive, and the language should not be interpreted as being mutually exclusive.

For example, it may be appropriate for an EDC that initially elected to recover its smart meter costs through a 1307 mechanism, which later files an electric base rate case before the cost are fully recovered, to include the remaining un-recovered costs in the base rate case. There may also be other instances in which it would be appropriate and consistent with cost recovery principles for an EDC to have flexibility to use either or both methods of cost recovery. In sum, the Draft Order should make it clear these recovery mechanisms are not exclusive. PECO has included proposed language in its Attachment A to address the foregoing issues.

### **2. Allocation of Costs to Customer Classes**

#### **PECO's Comment**

Subject to its previous comments, PECO has no comments on this section of the Draft Order. If necessary, PECO will address the comments of other parties on this section in its Reply Comments.

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<sup>20</sup> Draft Order at 12 (emphasis added).

## CONCLUSION

PECO appreciates the opportunity to comment on Staff's Draft Order and to respond to Staff's question regarding EDC smart meter deployment and installation plans. PECO believes that the initial Draft Order was helpful in identifying several critical issues that must be addressed and resolved in the Commission's final order.

In this regard, PECO requests that Staff adopt PECO's proposed revisions to the Draft Order. PECO looks forward to working with Staff and the other stakeholders in this proceeding as this process continues.

Respectfully submitted,

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Dated: April 20, 2009

Counsel for PECO Energy Company

**WORKING GROUP DRAFT  
March 27, 2009**

**ATTACHMENT A  
PECO Energy Company's Redline of Staff's Draft Order**

**PENNSYLVANIA  
PUBLIC UTILITY COMMISSION  
Harrisburg, PA. 17105-3265**

Public Meeting held

Commissioners Present:

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

Smart Meter Procurement and Installation

Docket No. M-2009-2092655

**IMPLEMENTATION ORDER**

**BY THE COMMISSION:**

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

**WORKING GROUP DRAFT**  
**March 27, 2009**

**BACKGROUND AND HISTORY OF THIS PROCEEDING**

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

**DISCUSSION**

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

**WORKING GROUP DRAFT**  
**March 27, 2009**

**A. Plan Approval Process**

Within nine months after the effective date of Act 129, each EDC with more than 100,000 customers is to file a smart meter technology procurement and installation plan with the Commission for approval. 66 Pa. C.S. §§ 2807(f)(1) and (6). As Act 129 became effective on November 14, 2008, the smart meter plans must be submitted on or before August 14, 2009. Each smart meter plan should provide a summary of the EDC's current deployment of smart meter technology, if any, and a plan for future deployment, complete with dates for key milestones and measurable goals. The Plans shall be served on the Office of Consumer Advocate, the Office of Small Business Advocate, the Office of Trial Staff, Electric Generation Suppliers licensed to provide service in the Commonwealth and Conservation Service Providers that are registered with the Commission.

Comments to the smart meter plans will be permitted to be filed within twenty (20) days of service. Following the receipt of comments, the Plans will be referred to the Office of Administrative Law Judge for such proceedings as may be deemed necessary. There will be at least one technical conference scheduled for each Plan during which the filing EDC will present personnel with in-depth knowledge of the plan who can respond to questions regarding all aspects of the plan. The technical conference(s) shall be transcribed and the transcript(s) will become part of the record in the proceeding.<sup>1</sup>

At the conclusion of the technical conference and any evidentiary hearings that may be necessary, an initial decision will be issued resolving all issues raised in the proceeding. It is anticipated that an Initial Decision will be issued within 120 days of the filing of the Plan. Parties will be permitted to file Exceptions and Reply Exceptions as

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<sup>1</sup> Any technical conference should be conducted as informally as possible, consistent with the good order of the proceedings. Lay persons will be permitted to directly ask questions of the EDC representatives, although such lay persons must be affiliated with an admitted Party of Record.

**WORKING GROUP DRAFT**  
**March 27, 2009**

set forth in Section 5.533 of the Commission's Regulations, 52 Pa. Code § 5.533. Parties are strongly encouraged to pursue settlement opportunities during the proceeding. It is expected that the comments and technical conference(s) will promote settlement efforts.

If no comments are filed on the EDC's smart meter plan, or if no parties oppose the plan at the conclusion of the technical conference, the EDC (and, if applicable, the parties) may request certification of the record to the Commission pursuant to 52 Pa. Code § 5.531(a) for a decision on the EDC's smart meter plan.

**B. Smart Meter Deployment**

Act 129 requires EDCs to furnish smart meter technology (1) upon request from a customer that agrees to pay the cost of the smart meter at the time of the request, (2) in new building construction, and (3) in accordance with a depreciation schedule not to exceed 15 years. 66 Pa. C.S. § 2807(f)(2). The Commission recognizes that a fully functional smart meter involves more than just the meter hardware attached to the customer's premises. A fully functional smart meter that supports the capabilities required by Act 129 and as outlined below, involves an entire network, to include the meter, two-way communication, computer hardware and software, and trained support personnel. The Commission also recognizes that it may take time for EDCs to select and install the required smart meter network components, and to train support personnel.

**1. Network Development and Installation Grace Period**

~~As~~ With regard to smart meter development and installation, we recognize that EDCs may need time to issue Requests for Information and Requests for Proposals, select and evaluate vendors and equipment, finalize contracts and delivery schedules, as well as ~~to~~ develop and install the smart meter network. We also recognize that as Pennsylvania's

**WORKING GROUP DRAFT**  
**March 27, 2009**

EDCs and electric companies in other jurisdictions may be “going to market” for smart meter equipment and technology at roughly the same time, there may be constraints on when equipment can be delivered and installed. Therefore, the Commission is granting a network development and installation grace period of up to 18 months following the Commission’s final ~~plan~~ approval of an EDC’s negotiated vendor contracts.

During this grace period the Commission will not require EDCs to install a smart meter at a customer’s premises. However, during this grace period, the Commission will require EDCs to provide interval meters or meters capable of providing interval data, if necessary, and ~~direct~~ access to customer interval meters data to third-parties, such as EGSs or CSPs, upon a customer’s request. This requirement will only apply if the customer agrees to pay the cost of the meter or meter data at the time of the request. In addition, EDCs will be permitted to continue to offer their already established and approved time-of-use rate programs.

We note that some commenters stated, in response to an early draft of this order, that providing third parties direct access to interval meters is not required by the Act and it presents security and reliability risks to EDCs’ systems. Accordingly, we will not require that third parties be provided with direct access to interval meters. However, we will require EDCs to provide interval meter *data* to third parties such as EGSs and CSPs during the grace period.

The Commission directs all covered EDCs to include in its smart meter procurement and installation plan filing a proposed network design and installation grace period not to exceed 18 months. Each covered EDC must include a justification and its plan for network design and rollout, and personnel training.

**2. Customer Request**

**WORKING GROUP DRAFT**  
**March 27, 2009**

As pointed out above, the Commission will not require EDCs to deploy smart meters until after the Commission-approved network development and installation grace period. Once this grace period expires, each covered EDC must supply a smart meter upon request by a customer, per Act 129.

The Commission recognizes that deployment of smart meters on a piecemeal or individual basis could involve greater costs than a systematic system-wide deployment. The General Assembly recognized this as well when it included the proviso that the customer requesting the smart meter must agree to pay for the cost of the smart meter. However, the Commission does not believe it was the intent of the General Assembly for this customer to pay the entire cost of the smart meter and its supporting infrastructure. Such a requirement would be so cost prohibitive that no customer would request a smart meter. Furthermore, the customer would be paying for the smart meter directly and also through the EDC's cost recovery mechanism. Such a result would be an absurd, impossible and unreasonable outcome, which is contrary to the rules of statutory construction. See 1 Pa. C.S. § 1922(1). To avoid this absurd result, the Commission believes that only the incremental costs over and above the cost for system-wide deployment are to be paid by customers requesting early deployment of a smart meter.

The Commission directs each covered EDC to include in its smart meter plan a proposal to install individual smart meters in advance of the EDC's system-wide deployment and after the network grace period. This proposal should include an itemization of the incremental costs. If an EDC cannot provide the incremental costs at the time of its initial filing, it will have to seek Commission approval of these incremental charges prior to the expiration of the approved network grace period. If an EDC does not obtain approval of these incremental costs prior to the end of the grace period it must install individual smart meters at its own expense. Such costs are not recoverable from ratepayers.

**WORKING GROUP DRAFT**  
**March 27, 2009**

**3. New Construction**

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

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

**4. System-Wide Deployment**

The Commission believes that it was the intent of the General Assembly to require all covered EDCs to deploy smart meters system-wide when it included a requirement for smart meter deployment "in accordance with a depreciation schedule not to exceed 15 years." It is this system-wide deployment that will provide the foundation for the EDCs' smart meter installation plans. Therefore, it is crucial for the EDCs to develop a plan that

**WORKING GROUP DRAFT**  
**March 27, 2009**

will best meet the needs of their service territory, while at the same time operating in a manner that is both cost and time effective.

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

It should also be noted that Act 129 uses the language “not to exceed 15 years.” An EDC is encouraged to expedite the deployment process if it will provide increased customer benefits in a cost-effective manner. [EDCs may also include proposals for incentives to accelerate their smart meter deployment in their smart meter plans.](#) Again, the primary goal of the EDC deployment plan should be to implement a deployment and installation schedule that best balances the overall efficiency and timeliness of the smart meter installations with the costs incurred.

**C. Smart Meter Capabilities**

Act 129 defines smart meter technology as including metering technology capable of bidirectional communication that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. 66 Pa. C.S. § 2807(g). The Act further states that the smart meter technology must provide

**WORKING GROUP DRAFT**  
**March 27, 2009**

customers with direct access to and use of price and consumption information, to include, (1) direct information on their hourly consumption, (2) enable time-of-use rates and real-time price programs, and (3) effectively support the automatic control of electricity consumption by, the customer, the EDC or a third-party, at the customer's request. 66 Pa. C.S. § 2807(g).

The Act further requires that default service providers submit time-of-use rates and real-time pricing plans by January 1, 2010, or at the end of the applicable generation rate cap period, whichever is later. Default service providers must offer the time-of-use rates and real-time pricing plans to all customers that have been provided with smart meter technology. 66 Pa. C.S. § 2807(f)(5). Real-time pricing is defined as "a rate that directly reflects the different cost of energy during each hour." 66 Pa. C.S. § 2806.1(m). A time-of-use rate is defined as "a rate that reflects the costs of serving customers during different time periods, including off-peak and on-peak periods, but not as frequently as each hour." *Id.*

The Commission believes that the smart meter capability requirements set out in Act 129 are minimal requirements. The Commission also recognizes that smart meter technology can support more than demand response and pricing programs. Smart meters have the ability to support maintenance and repair functions, theft detection, system security, consumer assistance programs, customer-generator net metering, and other programs that increase an EDC's efficiencies and reduce operating costs. Therefore, the Commission directs that a covered EDC's smart meter technology must support the following capabilities:

1. Bidirectional data communications capability.
2. Remote disconnection and reconnection.
- ~~3. Ability to provide 15 minute or shorter interval data to customers, EGSs, third parties and the regional transmission organization ("RTO") on a daily~~

**WORKING GROUP DRAFT**  
**March 27, 2009**

~~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.~~

~~5.3.~~ On-board meter storage of meter data that complies with nationally recognized non-proprietary standards such as ANSI C12.19 tables.

~~6.4.~~ Minimum of 14 days storage capability.

~~7.5.~~ Open standards and protocols that comply with nationally recognized non-proprietary standards.

~~8.6.~~ Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible.

~~9.7.~~ Ability to monitor voltage at each meter and report data in a manner that allows EDC to react to the information.

~~10.8.~~ Remote programming capability.

~~11.9.~~ Communicate outages and restorations.

~~12.10.~~ Ability to support net metering of customer-generators.

~~13.11.~~ Support service limiting and prepaid service programs.

~~14.12.~~ Support automatic load control by EDC, customer ~~and/or~~ third-parties, with customer consent

~~15.13.~~ Support time-of-use and real-time pricing programs.

~~16.14.~~ Provide customer direct access to consumption and pricing information.

**D. Access to smart meters and data**

Act 129 requires EDCs to make available to third parties, including electric generation suppliers and providers of conservation and load management services, with customer consent, direct access to the meter and electronic meter data. 66 Pa. C.S. §

**WORKING GROUP DRAFT**  
**March 27, 2009**

2807(f)(3). The Commission believes that the true usefulness of smart meters is to provide information to empower customers to control their electric use. For knowledge itself is power.<sup>2</sup>

—In order for customers to be empowered they, or their designated representatives, must have direct access to their consumption data and price data. —As noted above, however, we are cognizant that providing unrestricted access to EDC meters may present security (including competition) and reliability risks to EDC systems and, ultimately, the electricity grid. Therefore, we are directing Staff to convene a technical working group to define and address smart meter access, security and reliability issues. The working group should complete and submit its report to the Commission no later than \_\_\_\_\_, 2009.

~~Therefore, the Commission directs that all covered EDCs must provide at least the following access to their smart meters and data:~~

- ~~1. Non-discriminatory access for retail electric suppliers and third parties, such as EGSs, and conservation and load management service providers.~~
- ~~2. Open, non-proprietary two-way access for electric suppliers and third parties, such as EGSs, and conservation and load management service providers.~~
- ~~3.1. Full electronic access to customers and their representatives to meter data upon customer consent.~~

Notwithstanding this working group, ~~T~~the Commission ~~further~~ directs that each EDC plan must address standards and formats for electronic data communications with customers and third parties. There are many approaches for requesting and providing meter-level data today, e.g. electronic bulletin board, pass-key protected websites, compact disk, etc. In addition, EDI (ASC X12 standards) capability has been built by the electricity industry in the Commonwealth to facilitate a reliable, secure economic

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<sup>2</sup> Francis Bacon.

**WORKING GROUP DRAFT**  
**March 27, 2009**

approach for customer data communication for electric choice. Regardless of the standard or format identified, compliance with Commission orders relating to electronic data communications and the approved Internet protocol at Docket No. M-00960890F0015, is required for third-party access to EDC meter data. The third-party must be EDI tested and certified with the EDC and is free to transcribe that data into any format to meet the customer's specific needs. In order to achieve the capabilities of smart meter technology, however, EDCs are required to implement EDI Change Request #50 relating to 814 Enrollment and the new historical interval usage 867 HIU transactions. The 867 HIU must be updated to facilitate third-party exchange of interval usage at the meter level. A new 867 MIU transaction will also need to be developed and implemented for the exchange of monthly interval usage at the meter level. These and other developments necessary for the implementation of smart meter technology plans require EDC and third-party participation in the Commission's Electronic Data Exchange Working Group ("EDEWG"). The EDEWG is directed to create EDI capabilities for this purpose for implementation no later than January 1, 2010. We also direct the EDEWG to monitor the National Institute of Standards and Technology's ("NIST") current efforts to develop smart grid interoperability standards and protocols and to work closely with the technical working group addressing meter access security and reliability issues, to ensure that both working groups develop consistent and workable solutions for our consideration.

One alternate solution to the use of EDI specifically for the purpose of smart meter technology implementation that would be acceptable, is the use of retail energy standards and formats relating to demand response and energy efficiency that would be developed for meter level data communication by the North American Energy Standards Board ("NAESB"). Such NAESB standards must be available for implementation no later than January 1, 2010, or at the end of the EDC generation rate cap period. A second alternate and expedient, interim solution is partnership with an EDI-compliant third-party contractor who in turn, would provide data to the customer's authorized agent in any format specified by agreement between those two parties.

**WORKING GROUP DRAFT**  
**March 27, 2009**

**E. EDC Cost Recovery**

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

**1. Cost Recovery Mechanism**

An EDC may recover smart meter technology costs through (1) base rates, including a deferral for future base rate recovery of current basis with carrying charge as determined by the Commission; or (2) on a full and current basis through a reconcilable automatic adjustment clause under Section 1307. 66 Pa. C.S. § 2807(f)(7). We do not read the Act to require that these cost recovery mechanisms be mutually exclusive. Indeed, there may be instances in which it would be appropriate and consistent with cost recovery principles for an EDC to have flexibility to use either or both methods of cost recovery. We will consider such requests from EDCs as part of their plans. –However, the Act provides that in no event shall lost or decreased revenues by an EDC due to reduced electricity consumption or shifting energy demand be considered a cost of the smart meter technology recoverable under a reconcilable automatic adjustment clause under Section 1307(b), except that decreased revenues and reduced energy consumption may be reflected in the revenue and sales data used to calculate rates in a distribution rate base rate proceeding filed under Section 1308 (relating to voluntary change in rates), or a recoverable cost. 66 Pa. C.S. § 2807(f)(4).

**WORKING GROUP DRAFT**  
**March 27, 2009**

Act 129 allows an EDC to recover “all reasonable and prudent costs of providing smart meter technology.” In order to determine what these costs are, each EDC will provide a careful estimate of all costs relating to its smart meter deployment and installation plan. These costs will include both capital and expense items relating to all plan elements, equipment and facilities, as well as an analysis of all related administrative costs. More specifically, these costs would include, but not be limited to, capital expenditures for any equipment and facilities that may be required to implement the smart meter plan, as well as depreciation, operating and maintenance expenses, a return component based on the EDC’s weighted cost of capital, and taxes. Administrative costs would include, but not be limited to, costs relating to plan development, cost analysis, and reporting. In addition, the plan should include cost estimates for testing, upgrades, maintenance and personnel training. The EDC must also provide sufficient support to demonstrate that all such costs are reasonable and prudent with respect to its smart meter plan.

If an EDC decides to recover its smart meter technology costs through a reconcilable automatic adjustment clause tariff mechanism in accordance with 66 Pa. C.S. § 1307, ~~the~~ the Commission will require that this mechanism be included in that EDC’s smart meter plan. Such a mechanism shall be designed to recover, on a full and current basis from each customer class, all prudent and reasonable smart meter net costs. An EDC may only recover reasonable and prudent smart meter technology costs, to include “annual depreciation and capital costs over the life of the smart meter technology and the cost of any system upgrades that the [EDC] may require...incurred after [November 14, 2008,] less operating and capital cost savings realized by the [EDC] from the installation and use of the smart meter technology.” 66 Pa. C.S. § 2807(f)(7). The mechanism shall be set forth in the EDC’s tariff, accompanied by a full and clear explanation as to its operation and applicability to each customer class. The tariff mechanism will be subject to an annual review and reconciliation in accordance with 66

**WORKING GROUP DRAFT**  
**March 27, 2009**

Pa. C.S. § 1307(e). Such annual review and reconciliation will be scheduled to coincide with the submission of the “Smart Meter Progress” annual report outlined in B.4.

**2. Allocation of Costs to Customer Classes**

The Commission will require that all measures associated with an EDC’s smart metering plan shall be financed by the customer class that receives the benefit of such measures. In order to ensure that proper allocation takes place, it will be necessary for the utilities to determine the total costs related to their smart metering plans, as discussed in E.1. Once these costs have been determined, we will require the EDC to allocate those costs to the classes whom derive benefit from such costs. Any costs that can be clearly shown to benefit solely one specific class should be assigned wholly to that class. Those costs that provide benefit across multiple classes should be allocated among the appropriate classes using reasonable cost of service practices.

**CONCLUSION**

This Implementation Order establishes the Commission’s smart meter technology procurement and installation standards each EDC plan must meet. This Order also provides guidance on the procedures to be followed for submittal, review and approval of all aspects of each smart meter plan. In addition, it established the Commission’s minimum smart meter capability and guidance on deployment of smart meter technology. We extend our thanks to those who participated by providing comments on this crucial and timely energy program. We would especially like to note our appreciation for the cooperation and courtesy extended by all, which was essential in meeting the aggressive timelines established by the General Assembly for Act 129 implementation.

**THEREFORE,**

**WORKING GROUP DRAFT**  
**March 27, 2009**

**IT IS ORDERED:**

1. That the Commission establishes specific smart meter technology minimum capabilities and procedures for submittal, review and approval of all aspects of each smart meter plan to include cost recovery.
  
2. That electric distribution companies with greater than 100,000 customers adhere to the guidelines for smart meter technology procurement and installation identified in this Implementation Order.
  
3. That all electric distribution companies that are required to file a smart meter technology procurement and installation plan do so by August 14, 2009.
  
4. That this Implementation Order be published in the *Pennsylvania Bulletin* and served on the Office of Consumer Advocate, Office of Small Business Advocate, Office of Trial Staff, and all jurisdictional electric distribution companies.

**BY THE COMMISSION**

James J. McNulty  
Secretary

(SEAL)

ORDER ADOPTED:

ORDER ENTERED:

## ATTACHMENT B

### **PECO ENERGY COMPANY'S REPOSSES TO STAFF'S ADDITIONAL QUESTIONS RELATED TO THE SMART METER PROCUREMENT AND INSTALLATION PLANS**

#### **Summary**

PECO is pleased to comment on Staff's questions issued with its proposed Draft Order. Many of the questions are interrelated and require a summary of PECO's position to address them adequately.

On the subject of standards and protocols, PECO believes that these are best left to the marketplace and nationally recognized standards boards. It is without argument crucial for the smart metering solution to adhere to industry-accepted practices and standards in their design and operations. Indeed, the National Institute of Standards and Technology ("NIST") is currently working with the Electric Power Research Institute ("EPRI"), and interested stakeholders to fulfill responsibilities assigned to it under federal legislation to review smart meter standards and protocols. As PECO assesses the available options for transforming its fixed-network AMR system into a smart meter solution, the ability of the commercial solutions to meet expectations regarding security, interoperability, and interface standards will be closely evaluated by PECO. However, as is stated throughout this document, PECO does not believe that it is in the best interest of Pennsylvania's utilities, customers and other stakeholders for the Commission to mandate specific standards, protocols or platforms.

With regard to customer information access from the smart meter system, PECO's position is that there are two primary communication modes that can be leveraged. The first is the use of the smart meter as an access point to the consumer to enable the consumer to receive consumption information from the meter. The second is the use of the Internet, or similar broadband communication mediums to provide a richer source of information than that available through the meter. PECO believes that these two methods are complementary and should both be leveraged in a way that provides the customer, the customer's representative and PECO with flexibility to meet the needs of the customer *and* permit PECO to operate the smart meter network in a secure and robust fashion.

The Internet and similar broadband mediums can be leveraged to provide valuable and rich information to consumers. The energy consumption information available includes the customer's interval data usage that has been processed and billing determinants that translate the interval data into quantities relevant for the specific customer's rates (Time-of-Use, Real-Time Pricing, etc.). The information can be presented in different fashions to meet individual customer's information needs: engineering quantities, dollars spent, carbon footprint information, and similar views. This data can be combined with supporting information such as temperature data, comparison profiles, and analytical tools that allow the customer to perform what-if analysis, etc. The exact composition of the Internet package would be determined by the EDC or the customer's chosen energy service provider.

Regarding communication from the meter to the consumer, PECO's position is that the data to be provided from the meter to a Home Area Network ("HAN") device should be limited to the consumption information generated by and directly available from the meter. If desired by the customer, this should be limited to providing raw consumption data in the format supported by the meter to a HAN device. This raw energy consumption data will not be processed nor will it be of billing quality and should be used for informational purposes only. PECO anticipates that the default operating mode of the installed smart meters will be to provide raw consumption data as transmitted information from the smart meter, which may be viewed using third party devices. Beyond this default mode, PECO will support advanced rates and Demand Management programs by actively supporting devices for the provision of control signals for management of energy usage and the receipt of energy data for those PECO customers that are on advanced rate and energy management programs.

In addition, PECO believes that it is necessary to examine the role of the EDC in the Home Area Network and, specifically, the responsibility for managing the HAN network. PECO's position is that it is appropriate for the EDC to be responsible for the provision of energy usage data from the meter for the customer's HAN. Moreover, the EDC should not be responsible for the reception of the data or messages from the meter by HAN devices nor for the on-going operation of the HAN. The core competencies and Commission supported activities of the EDCs in Pennsylvania do not position them to provide in-home communications and networking services to consumers beyond data from the meter; this is best left to other parties in the marketplace.

With this overview of PECO's position on these issues, PECO hereby responds to Staff's questions.

## **Responses**

### **1. Overall Adaptability:**

- a. Should there be some common "plug and play" format and/or hardware on the meter to accommodate future technology changes? If so, provide suggested standards for this capability.

#### **PECO's Response**

PECO believes that the Commission should not identify specific standards to promote "plug and play" format but let the industry continue to enable this philosophy via its evolving standards. The meter manufacturing and energy information and control device community has shown the ability to use the consensus standards creating process to create usable tools for the industry.

The meter manufacturing industry has already made great strides in moving from exclusively proprietary device firmware and solutions to standards based solutions. The ANSI C12.19 standard, released in 1997 and updated in 2008, established a platform for the development of tables in which most information resides, allowing third parties to develop products that access these standard tables without having to develop solutions completely unique to each

manufacturer. In March 2009, ANSI C12.22 continued this standards guidance process, providing the process of transporting C12.19 table data over a variety of communication networks.

In the area of Home Area Networks, the industry is examining the Zigbee Smart Energy Profile (“SEP”), HomePlug and similar standards to enable in-home product interoperability and communications. This area will continue to evolve both in solution requirements and standards with additional iterations of the SEP and offerings for different standards such as 6lopan, WIMAX, and other platforms. One important aspect of continued standards support is the ability of the metering endpoints to support remote firmware upgrades. This will permit incremental support for standards as they evolve.

In addition, as PECO noted in its comments on the Draft Order, the National Institute of Standards and Technology (“NIST”), the Electric Power Research Institute (“EPRI”), and interested stakeholders are currently working together to develop smart grid interoperability standards and protocols.<sup>1</sup> Therefore, the Commission should not identify Pennsylvania-specific standards to promote “plug and play” format but let the industry, in cooperation with NIST, continue to develop uniform standards.

## **2. Home Area Network (HAN) Protocols:**

- a. What HAN protocol may be appropriate from the meter to the customer? What HAN open protocols are most readily available and accessible to customers? Should the Commission standardize a protocol? Should there be more than one protocol?

### **PECO’s Response**

While there are several alternative technical platforms and evolving standards available to support HAN solutions, the electric utility industry and vendor community has preliminarily examined the Zigbee specification, based upon the IEEE 802.15.4-2003 standard for wireless personal area networks (“WPANs”) as a possible solution. The support for this solution has generated a significant amount of vendor product development and interesting pilot projects. The Smart Energy Profile can be used by product manufacturers to produce interoperable products and can be the basis for compliance testing.

Concern for the ability of the Zigbee 2.4GHz solution to penetrate all premise locations and the technical limitations for its ability to reach inside buildings such as apartments and high-rise buildings necessitates multiple communication methodologies and HAN technologies to be used to cover all situations. This realization has resulted in collaborations such as the one between the Zigbee Alliance and the HomePlug Powerline Alliance where these two organizations are attempting to create a mechanism where the Smart Energy Profile could be used with both

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<sup>1</sup> See, EPRI To Facilitate Development of Smart Grid Roadmap, *Renewable Energy World.com*, April 13, 2009 <http://www.renewableenergyworld.com/rea/news/article/2009/04/epri-to-facilitate-development-of-smart-grid-roadmap?src=rss>

technologies. If successful, this collaboration would provide a solution that could be leveraged by both organizations and meet a larger portion of the market. However, even the combination of these two solutions may not be sufficient to cover all customer requirements or prove to be the long-term path that the market pursues. Additional technical solutions and similar coordination of additional standards is to be anticipated.

As to the Staff's question concerning whether the Commission should standardize a protocol, it is likely that each EDC will embrace a single primary technology solution to enable meter-to-HAN communications. Focusing on a single primary solution, realizing that additional focused alternative technical solutions may be required, will minimize the cost and complexity to the smart meter system implementation. Given these issues and the differences in the positions and needs of the Pennsylvania's utilities, PECO does not believe that a single standard or protocol should be required by the Commission.

In general, PECO believes that protocol standardization is best left to the market and not something that should be ordered by the Commission. The landscape of technology and standards is constantly evolving and involving regulatory processes into standards evolution could result in Pennsylvania's utilities being left behind as standards progress and need to be approved or recertified by the Commission.

- b. Should smart meter information be available through a HAN or an internet browser? If through an internet browser, should this come from a website, or directly from the meter, or both? Through which browsers should this be made available?

### **PECO's Response**

PECO believes that the best source of usable meter information will be that which is distributed through the Internet.

The Home Area Network solutions being made available in the marketplace allow a meter suitably equipped with the required Zigbee communication capability or similar device to send metering data to an in-home display within the premise and within certain performance limitations. In those situations, the value is in providing the consumer with illustrative information that helps them understand and manage their energy use in a near real-time manner. It is PECO's position that energy consumption information available from the meter will be limited to that information created by and available directly from the meter. This would primarily be raw consumption data.

For more detailed information retrieval, such as processed and validated, estimated and edited customer interval data; detailed outage or condition information; billing determinants and associated pricing information; a web-based solution should be used. This web solution should not interface directly with the meter but be supported via the utility and other customer-approved third-party back office systems. This will allow the customer to be presented with information consistent with what they will receive on their bill as opposed to the raw, unprocessed data available from the meter itself, coupled with the other valuable reference and complementary

information. For PECO's default service customers, the web-enabled data can be provided in conjunction with the existing PECO web presence. For customers served via electric generation suppliers ("EGS"), PECO would provide the processed consumption information to the customer's EGS who would use its tools to enable customer access.

In response to the Staff's final question concerning through which browsers should this information be made available, PECO believes that the tools being used should support the user's web browser of choice.

- c. Should there be other interconnectivity between the meter and other equipment in the home? If so, how much? [read capability vs. two way communication]

### **PECO's Response**

The meter HAN functionality must be capable of providing two-way communications to other HAN devices to enable the HAN joining process. Beyond the joining process, PECO envisions that the default smart meter configuration will act primarily in a one-way mode providing data, control signals or information to other HAN devices but not receiving information from or retransmitting HAN traffic back up through the smart meter network.

### **3. Utility usage data and meter access:**

- a. What usage data should the utility acquire through the smart metering system?

### **PECO's Response**

There is a variety of usage data available from commercially available smart meters. PECO believes that the most flexible approach is to collect interval data from the meters.

Through the use of a Meter Data Management System ("MDMS") and appropriate rate calculation applications and analysis tools, the interval data can be transformed into most of the types of billing determinants that may be necessary to support advanced rate design. The interval data could support traditional rates, time-of-use, critical peak pricing, demand charges, real-time-pricing, etc., provided both by EDCs and third parties. It is important to note that pricing programs may change over time, and what may make sense today could be altered in the future. Interval data provides the flexibility needed for the future.

The availability of the consumption data would also support the customer information delivery described in PECO's answer to question 2b above. The raw, unprocessed consumption data can be made available to customers directly from the smart meter to enable the customer to understand their energy demand and consumption characteristics. The processed interval data made available via the Internet can be provided for customer examination, can be aggregated into daily data, broken into TOU periods or otherwise analyzed by customers. It can allow "what-if" rate analysis by providing the basic building blocks of energy consumption. The

knowledge that they will gain through this information will enable the customer to better manage their energy use and support the state's energy efficiency and demand response goals.

- b. Should the Commission establish minimum standards on how often the utility should acquire the usage data from the meter?

**PECO's Response**

This is not necessary, nor does Act 129 require it. All major smart metering solutions collect the information from the meter at least daily – the exact frequencies depend on the particular technology chosen and network management criteria developed. However, collection of the data from the meter is only the first step in the process as the data is then aggregated in the smart meter collection system head-end for transmission to the MDMS where it is preprocessed and then validated, edited and estimated. The processed data is then applied against the customer's particular energy rates to transform the usage data into billing quality information. Because of the complexity of this process, and the time variability of the potential solution, PECO believes that the timing process questions are best left to individual technical solutions offered by the vendor community and selected by Pennsylvania's EDCs.

- c. Should the Commission establish minimum data intervals? If so, what should that be? [Examples: 15 minute, 30 minute, 1hr]

**PECO's Response**

No. First, as PECO stated in its comments, Act 129 requires that EDCs provide customers with information on their hourly consumption.<sup>2</sup>

Second, PECO believes that the basis for interval data requirements should be the rate choices that the data is intended to support and the information needs of the customers. There are currently no rate structures that require collection of interval data for the mass market at less than hourly resolution. It is possible that 15-minute data may be desirable for residential and small commercial customers participating in some future demand response or real-time pricing programs, but it is not apparent that there is value to collect data at this level of resolution for all customers. Almost all jurisdictions have identified hourly data as the minimum for small commercial and residential customers. In the large commercial and industrial segment, 15-minute data is often used as the default interval resolution.

It should also be noted that the indiscriminant collection of interval data at resolutions beyond what is required by the customer's rate choice or that which can be effectively used by the customer results in significantly increased data management complexity and costs with no beneficial impacts. If the Commission feels it necessary to establish minimum standards, PECO

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<sup>2</sup> 66 Pa. C.S. § 2807(g)(1).

would suggest hourly resolution for residential and small commercial and 15- minute resolution for large commercial and industrial customers.

- d. What minimum timeframe should the Commission establish on when usage data is made available by the Meter Data Service Provider (MDSP, usually the EDC) to the EDC, CSPs/EGSs and customers, respectively?

**PECO's Response**

As described in PECO's answer to question 3b, the data is typically collected by the AMI system at least daily. If consumption data that has not been validated is to be provided to the CSPs/EGSs, this could reasonably occur during the following business day. However, PECO believes that the CSPs, EGSs and customers will prefer to have the validated and processed information and as such the timing requirements are longer. The system processing needs require that the validation, estimating, editing, and processing steps must start after the conclusion of each day and the processing time involved requires that the data be offered as available to third parties *no earlier* than the conclusion of business following the day that the usage occurs and specific EDC systems may require more time.

It is possible that for a small percentage of customers, their size or criticality requires more rapid provision of data and this could be supported. However, segmenting the customer base into too many individual processing units impacts system efficiency and should be avoided.

- e. Should this usage data be validated first?

**PECO's Response**

If the data is being provided to a CSP/EGS, then it is likely that these companies will wish to receive raw data and use their own validation processing. For end-use customers of the EDC, the raw data should be validated prior to provision to the customer to ensure the ability to translate the usage data into cost information and produce value to the customer while reducing confusion and questions.

- f. Should the Commission establish a common Validation, Error Detection, and Editing (VEE) protocol? If so, what should that be?

**PECO's Response**

PECO believes that the Commission should not establish a common Validation, Editing and Estimation ("VEE") protocol but should allow the states' EDCs to provide this capability via their own processes. The commercially available Smart Meter Data Management solutions have robust, if varied, VEE applications. Any establishment of a common protocol will reduce

innovation by these vendors, introduce state compliance and testing issues, and ultimately will negatively impact the states customers.

- g. Should the Commission establish a maximum period in which the MDSP should complete the VEE analysis? If so, what should that maximum period be?

### **PECO's Response**

This is a complex issue and will likely require further consideration within a Commission working group. The recurring completion of the smart metering process, from data collection through data processing, requires diligence and appropriate time to ensure accuracy and reliability. The VEE process used by most Smart Meter Data Management solutions and utilities uses the “ending day” register read, coupled with interval data and meter alarms to support the VEE process. Thus, it is necessary to wait until all of the data is collected after the end of the day before the data is staged into the VEE processing activity. Allowing for the appropriate processing time to complete this VEE implies that the data may be made available to external parties no earlier than late the following day. It is possible that high priority customer classes could be processed first, but any effort to segment the population into groups with varied processing requirements will add to the time for the entire population to be completed.

- h. How should customers be provided direct access to usage information? [examples, website access, HAN to an in-home display or other devices]

### **PECO's Response**

The platform that provides the richest information resource for direct customer access to the usage information is via the Internet. It is PECO's intention to use this method to provide the processed and billing quality usage information, additional service information and other education and analysis tools to allow consumers to understand and take action on their energy usage. It is also anticipated that this medium will be the vehicle of choice by CSPs and EGSs to provide information to their customers.

The provision of raw usage data via HAN-enabled in-home displays (“IHD”) from the meter is an alternative to provide more rapid access to the energy usage data available from the meter. However, caution should be exercised in understanding the limitations of this method of providing usage information directly from the meter to the customer as this data will be raw in nature and therefore *not* validated for billing purposes. In addition, the bandwidth implications and network management requirements of the Smart Meter network of enabling usage data to all customers implies that the data provided “directly” to customers should be restricted only to that data that the Smart Meter measures itself or calculates locally, thus limiting the communication of usage data to the HAN only without burdening the LAN or WAN. Additionally, the reliability of HAN display devices is unproven in all variants of housing configurations and in large scale deployments. For this reason, PECO supports the provision of HAN enabled data from the meter

but suggests that the receipt and display of this data will be enabled by the customer themselves or independent third parties.

PECO intends to directly support the provision of the energy usage data and provide the in-home devices or tools for those PECO customers who select advanced rates and energy management programs sponsored by PECO.

- i. Should the Commission establish standard protocols and communication medium for providing direct access to usage information from the meter to the HAN? If so, what should those be?

### **PECO's Response**

No. As discussed in the answers to questions 2a and 2b above, the most common HAN platform being considered for commercial deployment today is based on the Zigbee technology and its Smart Energy Profile. This is an evolving specification that is being supported and leveraged by the Zigbee Alliance comprised of HAN energy product manufacturers, smart meter solution vendors and meter manufacturers. In addition, given the need to provide solutions for all types of customer locations, including where it will pose difficulty or be impossible for the Zigbee solution, additional in home technologies may be considered. PECO does not believe it necessary to establish additional regulatory standards or requirements on this issue.

- j. How should this Commission provide direct access to the meter to third parties? What policies or regulations should this Commission promulgate to ensure that these third parties are provided timely access under reasonable terms and conditions to the customer metering facilities?

### **PECO's Response**

PECO believes that the third parties will be best served by receiving aggregated information from PECO for their customers through electronic data interface ("EDI") exchanges. This provides the greatest assurance of quality, reliable data and minimizes the data management complexities of the interchange.

In addition, as discussed in detail in answers to previous questions, the Smart Meter can supply raw and unprocessed meter data, via its HAN support to an independent HAN device that has Internet connectivity or other independent communications. There are commercially available products that support Zigbee or similar communications standards and are connected to PCs via their USB plug. If a customer authorized third party wishes to obtain direct meter data, this avenue is available and does not require any EDC involvement. It should be noted that in this scenario, PECO has no involvement in and is not expecting to provide support for the HAN system setup, management or operation.

PECO does not see any need or advantages for third parties to have access across the metering system and its communications network to the actual metering devices or local direct access to the meter. In fact, PECO believes that there are significant security and network management risks associated with opening up the core smart metering network to third parties. PECO strongly emphasizes that this would run counter to the efforts to create secure and reliable smart grid and smart metering systems. In addition, if the smart metering system communication networks are to be leveraged to provide additional grid control and operations capability, conflicts with federal legislation and regulatory mandates would occur.

- k. What communications, software or hardware can facilitate this direct access to the meter for customers and their third parties, and should the Commission establish requirements and or standards to facilitate this access?

#### **PECO's Response**

As described in detail in the answers to questions 2a and 2b, the HAN model provides customers with direct access to usage data created by the smart meter. Using the HAN enabled model described in the answer to question 3j above, current commercial vendors produce technologies that enable a typical personal computer to be joined to a HAN. The authorized third party could provide the user with an application that would collect and aggregate the information supplied from the meter and the internet. Access to the information in this fashion would allow the third-party to analyze and use the data in any fashion it deemed in its or its customers' best interest.

- l. What electronic access to customer meter data do CSPs and EGSs need from EDCs, that they currently do not have? Provide specific examples where these entities do not have such access currently, and provide examples, if available, of electronic transactions that can be adopted by this Commission to comply with this statutory requirement.

#### **PECO's Response**

PECO believes this question is primarily addressed to CSP and EGSs. Nonetheless, assuming, but not conceding, that such issues exist, PECO believes that the appropriate forum to address these issues is the Commission's Electronic Data Exchange Working Group.

#### **4. Meter to EDC Communications:**

- a. Should the Commission standardize public protocols from the meter to the grid?

#### **PECO's Response**

No, consistent with its prior answers, and comments on the Draft Order, PECO believes that the method of network design and management, including protocols used, is best left to stakeholders and to the marketplace. There are many qualified smart meter solution vendors that have

credible solutions today. All are working towards providing more open and standardized solutions and indeed the standards themselves are evolving. PECO does not believe it prudent to establish state-specific protocols.

- b. If certain protocols are not effective in certain geographic or rural regions, should the Commission adopt a list of protocols that can accommodate all of Pennsylvania customer's communication requirements? If so, what additional protocols should be adopted?

### **PECO's Response**

PECO believes it more appropriate for the Commission to focus on the desired results of a smart meter system, the functionality to be enabled and the individual stakeholder and societal information needs. The requirements and uses of the systems will determine the best solutions for Pennsylvania's EDCs and its customers.

- c. What bidirectional communication mediums [Example: broadband over powerline, cellular, phone lines, RF] are least cost? What are the pros and cons of each?

### **PECO's Response**

There are several viable smart meter solution architectures available today: RF hierarchical systems, RF mesh and powerline communications. Each architecture and indeed each vendor's specific implementation of the architecture have strengths and weaknesses and are better suited for different utility requirements, customer densities and geographic topologies. It is impossible to identify a general "least-cost" solution as the implementation costs of the different solutions are highly dependent on the individual utility.

PECO is in the process of evaluating options of upgrading or replacing its current fixed network AMR solution to an industry-leading smart meter solution. As part of this process, PECO has engaged outside consulting resources and, combined with its internal technology and business teams, and is evaluating the available solutions – from technical and business perspectives. In conjunction with approved and normal regulatory processes, PECO will provide details of its proposed choices and the economics of those decisions. The Company believes that it would be imprudent to provide a highly preliminary analysis at this point in time.

## **5. Access to Price information:**

- a. How should customers be provided direct access to pricing information? [examples, website access, HAN to an in-home display or other devices]

### **PECO's Response**

PECO believes that direct connections via the Internet or other publicly available communications channels between the customer and its energy supplier is the best mechanism to provide the customer with pricing information. The use of the Internet would allow for deeper, more customized, and real-time pricing information provision. The information display can incorporate previous pricing, average pricing, expected future pricing, etc. depending on what the customers EDC, CSP, EGS or third party supplier wishes to present.

- b. Should the Commission require the meter to communicate price information, or should this information be provided over another communication medium?

### **PECO's Response**

In a deregulated environment, where price information is dependent on the individual energy supply contract of each customer, the meter is not suited to provide individual, unique and customized pricing information tailored to specific customers and in this situation, the Internet or other dedicated communications channel should be used.

- c. What pricing information should the Commission require to be provided? [examples, RTP, Day ahead prices, default service rates]

### **PECO's Response**

The necessary pricing information will depend entirely on the rate being implemented for the customers involved. It should be sufficient to say that whatever method is used to communicate the pricing information, the information provided will constitute that necessary to support the customer's rate. As an example, if critical peak rates are implemented with day-ahead notification; then the day-ahead price should be provided in advance of the event as well as actual event price being provided during the event.

- d. Should the Commission establish minimum standards on how frequently price information should be provided? If so, what should be the minimum standard?

### **PECO's Response**

No. The frequency of transmission of the price information is entirely dependent on the rate being implemented and how often the price changes. If the customer is on default service rates where the price is not changing, then there is no value to re-sending the same information multiple times. For Time-of-Use programs where the price does not change frequently, then continual retransmission of price is unnecessary. For Critical Peak Pricing, Real-Time Pricing, day-ahead pricing and other programs, the pricing information delivery needs to support the rates offered and allow the customer to always know the price of the energy being consumed. No

minimum standards are necessary and they would be confusing and restrictive as the minimum frequencies would need to be established for any possible variation of advanced and innovative pricing programs that have not yet been developed.

- e. Should the Commission establish standard formats for presentation of price information? If so, suggest a format.

### **PECO's Response**

PECO does not believe it necessary to establish standard formats for the presentation of price information to customers. If the Internet is used as recommended for the provision of pricing information, then the responsible energy provider should be free to design their own pricing web pages and methods of communications.

### **6. Automatic Control:**

- a. How can smart meters “effectively support” automatic control of customer’s electricity consumption by customers, utilities and the customer’s third party?

### **PECO's Response**

There are several manners of automatic load control. The industry has used direct load control devices and accompanying incentive or rebate programs to provide demand response benefits for over 20 years. There are both stand alone control technologies as well as control technologies that integrate to varying degrees with smart meter networks.

Stand-alone energy management systems are available that use the Internet for backhaul communications and allow customers to control a large array of end-use appliances. Several energy service companies and product/systems manufacturers offer these solutions directly to customers. Third parties authorized by the customer could also use these types of systems. These solutions do not require the services of the smart meter system.

Some customer load control programs may also be enabled by the smart metering or AMI systems but do not necessarily require integration with the customer’s meter. In these cases, the load control or demand response device communicates directly into the smart meter system local area network layer and is managed by the EDC.

The meter itself can support some automatic control solutions such as HAN enabled controllable thermostats, direct control devices or similarly enabled products assuming that the meter is HAN enabled. In this case, the control initiation is a specific control signal that is sent over the smart meter network to the meter.

- b. How is the smart metering system engaged in the initiation, maintenance, relinquishment, and verification of the automatic control of customer consumption?

**PECO's Response**

The ultimate verification of actual control of load is the analysis of the customer's interval consumption information before, during and after the control event. There are valid reasons why a load reduction may not be obtained. Depending on the program design, the customer may be able to override the control signal or the appliance being controlled may not be in operation at the time of the event. As previously mentioned, it may be necessary to collect more refined interval data for automation-enabled customers than the basic hourly interval data proposed for residential customers. In any event, the interval data being collected by the smart meter system provides the final accounting of customer participation in the control event and should be the extent of the smart metering system's involvement in the measurement and verification process.

- c. What smart metering protocols and communication mediums are needed to implement these automated controls? Should the Commission establish standard protocols and standards for this purpose?

**PECO's Response**

As with the answers to the metering data questions in sections 1 through 3, PECO does not believe that the industry requires specific standards to be mandated for the demand response and load control functionality of the smart metering system. Sufficient industry knowledge and offerings exist to enable these programs to be successfully implemented. It is evident that if third parties are to be enabled to send control signals to the EDC's customers, then an electronic data exchange process must be developed, but a new standard is not required.

- d. What energy consuming customer assets can be controlled by these smart meter systems for each of the customer segments, and how is control of these assets impacted by the choice of communication medium and protocol?

**PECO's Response**

The direct load control products mentioned in the answer to question 6a are being used to control air conditioning, strip heating, pool pumps and filters, agricultural pumping loads, and electric water heaters. The controllable thermostats primarily control A/C systems but could control space heating also. There are also HAN enabled end-device plug controls that could be used in conjunction with a home energy management system to control virtually any customer plug load.

Customer Segment	Assets to be Controlled
Residential	Residential customers have many and varied energy assets that can be controlled. The most common high demand assets include air conditioning, space heating, and electric water heaters. In addition, substantially any energy consuming device can be controlled via commercially available HAN solutions that enable end-device plug controls that could be used in conjunction with a home energy management system to control virtually any customer plug load.
Small Commercial	The largest energy consuming assets for small commercial customers tend to be space conditioning and refrigeration. Both of these uses lend themselves well to simple energy management solutions or HAN enabled control equipment.
Agricultural	The single largest agricultural energy use is in pumping loads. The use of a direct load control device to control pump loads is available and can be enabled directly from a dedicated load control system as a HAN is not likely to be installed or function well in an agricultural environment.
Large Commercial and Industrial	Large Commercial and Industrial customers traditionally use customized energy management systems that are tailored to their unique needs. They incorporate consumption and pricing information into the decision criteria process but these systems are not well suited to external control as the impact on the customer's operations is paramount.

The support of the above-reference solutions is not specifically dependent on the chosen communication medium or protocol used in the smart meter system.

**7. Smart Metering Acceleration:**

- a. To the extent permissible under the law, should the Commission provide an incentive to EDCs to accelerate their smart meter deployment by giving a credit towards the required Energy Efficiency and Conservation Goals? If so, how should such credit be determined?

### **PECO's Response**

PECO does not oppose such a concept. However, PECO believes that incentives such as recovery for accelerated depreciation of assets or other financial incentives, to the extent permissible by law, would provide better mechanisms to encourage accelerated smart meter deployment. Consistent with its Comments on Staff's Draft Order, PECO recommends that the Draft Order explicitly provide that EDCs can include such proposals in the smart meter procurement and implementation plans for Commission consideration.

### **8. Cost Recovery:**

- a. Should the Commission establish a standard format for providing the various components of the capital and operating costs and benefits of these smart metering systems to facilitate the comparison of the EDC plans? If so, please provide a suggested standard format.

### **PECO's Response**

No, as PECO noted in its comments on the Draft Order, a "one-size fits all approach" to smart meter deployment is not the best way to provision smart meters in a timely and cost effective manner. For this reason, PECO also believes that providing a standard format for providing the various components of the capital and operating costs and benefits EDC smart metering systems would be difficult to implement and should not be established by the Commission.