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August 2, 2010

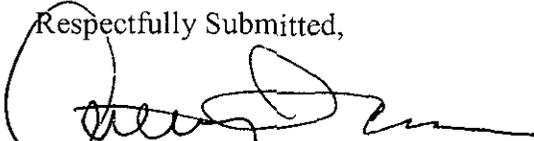
Rosemary Chiavetta
Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

**RE: Petition of PPL Electric Utilities Corporation for Approval of a Smart Meter
Technology Procurement and Installation Plan
Docket No. M-2009-2123945**

Dear Secretary Chiavetta:

Enclosed please find PPL Electric Utilities Corporation's 2010 Annual Smart Meter Plan Filing for the above-referenced proceeding. Copies will be provided as indicated on the Certificate of Service.

Respectfully Submitted,



Anthony D. Kanagy

ADK/skr
Enclosure
cc: Certificate of Service
Honorable Wayne L. Weismandel

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2010 AUG -2 PM 3:34
SECRETARY'S BUREAU

Before the
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PPL Electric Utilities Corporation
Smart Meter Technology Procurement and Installation Plan

2010 ANNUAL SMART METER PLAN FILING

Docket No. M-2009-2123945

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August 2, 2010

I. INTRODUCTION

In this filing, PPL Electric Utilities Corporation ("PPL Electric" or the "Company") is submitting its 2010 annual smart meter plan update filing as required by the Pennsylvania Public Utility Commission's ("Commission") Order entered on June 24, 2010. *Petition of PPL Electric Utilities Corporation for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123945 ("June 24 Order"). In the June 24 Order, the Commission approved the Company's Smart Meter Plan, with certain modifications that are discussed below. In addition, the Commission authorized PPL Electric to file a tariff supplement implementing a Smart Meter Technologies Charge Rider ("Smart Meter Rider"). PPL Electric notes that the Office of Consumer Advocate ("OCA") has filed a Petition for Reconsideration regarding allocation of non-direct costs under the Smart Meter Rider. Therefore, PPL Electric is delaying the filing of its Smart Meter Rider tariff supplement to give the Commission the opportunity to rule on OCA's Petition. In the event that the Commission does not rule on OCA's Petition by its Public Meeting now scheduled for September 2, 2010. PPL Electric intends to file its Smart Meter Rider and will revise it, if necessary, in a later filing to address any changes adopted by the Commission.

II. BACKGROUND

PPL Electric provides electric distribution, transmission and default generation services to approximately 1.4 million customers in a certificated service territory that spans approximately 10,000 square miles in all or portions of 29 counties in eastern and central Pennsylvania. PPL Electric is a "public utility" and "electric distribution company" ("EDC") as those terms are defined under the Public Utility Code, 66 Pa. Code §§ 102 and 2803.

On August 14, 2009, PPL Electric filed its Smart Meter Plan with the Commission pursuant to Act 129 of 2008, P.L. 1592 ("Act 129") and the Commission's Smart Meter Implementation Order. *Smart Meter Procurement and Installation*, Docket No. M-2009-2092655, Order entered June 24, 2010.

As explained in the Company's Smart Meter filing, PPL Electric already has installed an advanced meter infrastructure ("AMI") system in its service territory. The Company estimated that it would cost between \$380 and \$450 million to replace its existing AMI system. Based on its investigation, the Company indicated that it did not believe that a wholesale replacement of its AMI system would provide sufficient expanded functionality to justify its costs. Therefore, under its Smart Meter Plan, PPL Electric proposed to study, test, and pilot applications that enhanced and expanded upon the capabilities of the Company's existing smart meter system, focusing primarily on those that required a benefit to cost analysis as directed by the Commission Order. In its Smart Meter Plan, PPL Electric also proposed a cost recovery mechanism consistent with the requirements of Act 129 and the Commission's Implementation Order.

The Office of Trial Staff ("OTS") filed a Notice of Appearance in the proceeding, and the OCA and Office of Small Business Advocate ("OSBA") filed Notices of Intervention. In

addition, the PP&L Industrial Customer Alliance (“PPLICA”), Pennsylvania Department of Environmental Protection (“DEP”), Constellation NewEnergy, Inc. and Constellation Energy Commodities Group Inc. (collectively “Constellation”) and the Pennsylvania Association of Community Organization for Reform Now (“ACORN”) intervened in the Company’s Smart Meter proceeding. Various parties submitted direct, rebuttal and surrebuttal testimony. Evidentiary hearings were held before Administrative Law Judge Wayne L. Weismandel (the “ALJ”) on November 3, 2009. Interested parties filed briefs and reply briefs. On January 28, 2010, the Commission issued the ALJ’s Recommended Decision, which recommended that the Commission approve the Company’s Smart Meter Plan with certain modifications. PPL Electric, OCA, OTS, PPLICA and DEP filed Exceptions to the Recommended Decision. In addition, PPL Electric, OCA, PPLICA and ACORN filed Reply Exceptions to the Recommended Decision.

On June 24, 2010, the Commission entered its order in the Smart Meter proceeding. In its June 24 Order, the Commission revised certain aspects of the Company’s Smart Meter Plan. These included:

- Modifying the Company’s proposed cost recovery mechanism and reconciliation period;
- Requiring the Company to file Service Limiting and Pre-Pay Metering Pilot Plans for the Commission’s consideration;
- Requiring the Company to continue to identify, test, develop and implement cost-effective means for directly providing metered usage data to customers;
- Requiring the Company to address how its smart meter technology will effectively support the automatic control of a customer’s consumption by a customer’s chosen third party, in addition to the customer or PPL Electric;
- Requiring the Company to expand its metering capabilities to meet Act 129’s requirements;
- Eliminating the Company’s proposed Feeder Meter pilot program;
- Requiring the Company to ensure that its pilot programs address the need, ability and cost for sub-hourly metering;
- Requiring the Company to recover smart meter plan costs from Large C&I customers through a fixed customer charge.
- Requiring the Company to allocate non-direct common costs based on the ratio of the number of meters assigned to the class, divided by the number of meters for the entire system.

In its June 24 Order, the Commission also required PPL Electric to file annual smart meter filings with the Commission. Pursuant to the Commission’s Order, PPL Electric

hereby submits its annual filing. Below, PPL Electric explains how it has revised its Smart Meter Plan in response to the modifications adopted by the Commission. In addition, the Company describes the actions that it will take under its Smart Meter Plan in 2010 and 2011.

As explained above, the OCA has filed a Petition for Reconsideration regarding the allocation of non-direct costs under the Company's plan. Therefore, the Company *intends to delay filing its Smart Meter Rider to give the Commission an opportunity to resolve the issue that was raised in the OCA's petition.*

III. DISCUSSION

A. Modifications To the Company's Smart Meter Plan.

Below, the Company summarizes the revisions that it has made to its original Smart Meter Plan as filed with the Commission on August 14, 2009. Many of the revisions are in response to the modifications required by the Commission's June 24 Order. However, the Company has made certain other revisions to its Plan in response to evaluations that it has conducted since it filed its Plan and in response to advancements in technology. These changes are summarized below. In addition, the Company has revised Attachments 1–3 of its original filing to reflect the revisions to the Plan and is providing clean and redlined versions of these Attachments.

1. Provide customers with direct access to and use of price and consumption information.

As indicated in its August 14, 2009 filing, PPL Electric has plans for testing communication channels such as near real-time e-mail and text messages to provide price and consumption information to customers. Originally, this pilot included costs for a 2010 evaluation and, if feasible, an implementation of this enhancement in 2011 to customers who ultimately desire this capability. The Company has received more information on the costs to send messages to customers and based on that information has decided to continue evaluating the available technologies in 2010 to provide this service to customers and pilot the technology in 2011 with 10,000 customers. Piloting the technology will provide the opportunity to further define the costs and benefits of sending price and usage messages to customers. The total estimated cost of this pilot is \$143,000.

The Company plans to conduct a pilot that will provide customers with an in-home display that will provide direct real-time access to their energy consumption and costs. This pilot, as scoped, will focus on understanding the technology and benefits of providing customers with direct real-time access to their energy and cost information.

In order to fully address the issues raised in the Commission's Order, the Company will undertake, in parallel with its technology pilot, an investigation into the practical issues and costs of other methods for providing customers direct access to price and consumption data. In this way, the Company expects to be able to provide a complete

assessment of the incremental costs and benefits of a full spectrum of alternative means to provide this information to customers.

2. Enabling TOU and RTP Programs.

Regarding real-time pricing programs, PPL Electric's currently deployed AMI is capable of accommodating the delivery of hourly data in accordance with PJM hourly pricing. Beginning January 1, 2010, these programs were offered to large industrial and commercial ("Large C&I") customers taking delivery at primary voltage and above. Beginning in January 2011, the Company will offer this option to all customers with demands that are greater than 500 kW. An evaluation was completed in early 2010 to determine if the power line meters could provide adequate data to bill real-time pricing to customers with demands that are greater than 500 kW. Although the performance evaluation did not find any significant issues with regard to data collection, there are currently limitations within the billing system that must be addressed before power line meters can be used for real-time pricing. Therefore, PPL Electric determined that it was most cost-effective to read the accounts with demands greater than 500 kW with the large power meter wireless system. This amounted to 320 accounts and was completed in 2010 outside of the Plan.

3. Supporting the automatic control of customer's electric consumption.

PPL Electric plans to conduct a pilot in 2011 to exercise the capabilities of the AMI currently deployed to automatically control an individual customer's electric consumption. This will be accomplished by installing load control devices on certain customer equipment, including air conditioning systems and water heaters. Preparation for this pilot began in 2010 and the pilot will run during the summer of 2011. This pilot was originally intended for 2010, but has been delayed due to emerging technology and final approval of the Company's Smart Meter Plan. This pilot will also investigate and report on the feasibility, costs, and benefits of various means by which 3rd parties can exercise control over the load control devices.

The estimated cost of the pilot is \$507,200. Approximately \$93,200 will be spent in 2010 to prepare for the pilot and \$414,000 will be spent in 2011 to conduct the pilot. The pilot and implementation costs have changed due to higher than expected equipment costs. Implementation will be dependent on the benefits of the program.

4. Ability to provide 15-minute or shorter interval data.

PPL Electric is conducting a pilot in 2010 to assess the capability to provide 15-minute interval data on a consistent basis using power line meters that have the capability to be configured for 15-minute data collection at the residential and small commercial customer level. The estimated cost to perform this evaluation is \$134,000. The objectives of the evaluations are to determine (1) the ability of the power line smart meter infrastructure to provide 15-minute interval data on a consistent basis using meters with additional functionality at the small commercial customer level, (2) the

feasibility of providing 15-minute interval data to all small commercial customer, and (3) the benefits associated with providing such granular data to customers to determine if the benefits are cost-justified. The objectives of the pilot have changed to align with the Commission's June 24 Order.

In addition to reporting the pilot results, PPL Electric will provide a response to the questions that were set forth by the Commission on pages 28-29 of its June 24 Order.

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

Originally, the Company planned to explore incorporating IEEE 802.15.4 compliant Zigbee communications into a home area network through a pilot. Instead, the Company now plans to incorporate IEEE 802.11 compliant wireless local area network (WLAN) communications into a home area network pilot. The Company believes that protocol will be more generally accepted in the future than Zigbee communications. Although we do not have specific statistics, we believe many of the Company's customers already have WLAN in their home and devices that communicate over WLAN. An update to the Zigbee communication standard is expected to be released in late 2011, and it is not backwards compatible with the current standard. Therefore, Zigbee devices on the market today will be obsolete by the end of next year. Implementing the pilot with the IEEE 802.11 standard will decrease the overall cost of the pilot and provide the potential for future pilots that could test the ability to control customers' end-use devices.

The estimated cost of this pilot is \$305,500 and, if the pilot is successful, then a potential annual deployment to an anticipated 10,000 customer enrollment from 2012-2014 may result in a total estimated implementation cost of \$3,965,000.

6. Feeder Meter Pilot Program.

In response to the Commission's June 24 Order, the feeder meter pilot has been removed from the Company's Smart Meter Plan.

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

The Company has begun preparing for the power line carrier ("PLC")-based pilot in 2010 to better coordinate defining the Company's voltage requirements. The Company's Smart Meter Team and Smart Grid Team are coordinating efforts to determine the most cost-effective approach to meeting the Company's voltage monitoring requirements.

8. Ability to communicate outages and restorations.

If the Company's proactive outage pilot is successful, it is expected that implementation will occur in 2011 at an estimated cost of \$170,000. This cost has increased from the original estimate due to higher than expected vendor costs.

9. Ability to support net metering of customer-generators.

Costs for this pilot and implementation have changed as a result of further evaluation of the net metering requirements and the need to modify information technology systems rather than simply changing meters. The Company found that the new standard power line meter can retrieve all necessary net energy flow, but that the back-end systems could not process net energy flow. In addition, the Company will implement new business processes to ensure that new net metering customers have the correct meter installed and that the meters of existing net metered customers are changed as appropriate. The cost of meter changes will be recovered through base rate proceedings outside of the Plan. This eliminates the need for capital expenditures in 2012 through 2014 in the Smart Meter Plan.

10. Cost Recovery.

In its June 24 Order, the Commission modified several aspects of the Company's cost recovery proposal, including modifying the manner by which the Company determines its capital structure, return on common equity, and cost of debt for purposes of cost recovery under its Smart Meter Rider. The Commission also modified the Company's proposed methodology for allocating non-direct costs to the customer classes. As explained above, the OCA has filed a petition for reconsideration regarding this issue. The Company has delayed filing its revised cost recovery mechanism to give the Commission the opportunity to rule on the OCA's petition for reconsideration. In the event that the Commission does not rule on the OCA's petition by its Public Meeting now scheduled for September 2, 2010, PPL Electric intends to file its cost recovery mechanism at that time. The Smart Meter Rider then filed by PPL Electric will reflect the allocation of non-direct costs as it is provided for in the June 24 Order.

B. Smart Meter Plan Actions For 2010 And 2011.

Below, PPL Electric summarizes the actions that it will take under its Smart Meter Plan in 2010 and 2011. The Company notes that these actions, including the timeline for performing these actions, are set forth in additional detail in Attachments 1-3 of this updated Plan. For ease of reference, the Company has followed the order of smart meter requirements as set forth on pages 29-30 of the Commission's Smart Meter Implementation Order, and as set forth on pages 17-32 of the Company's original Smart Meter Plan.

1. Bi-directional data communications.

The Company does not expect to conduct specific pilots in this area, but will perform a pilot using in-home displays with home area networks. This pilot is scheduled for 2011. This pilot is discussed below under the requirements for open standards and protocols.

2. Recording usage data on at least an hourly basis once per day.

PPL Electric's currently deployed AMI meters record usage data on at least an hourly basis once per day.

3. Providing customers with direct access to and use of price and consumption information.

PPL Electric provides access to price and consumption information to various groupings of customers and individual customers through the Energy Analyzer, PPL Electric's website, and pulse data. As a way to enhance this capability and to provide such data more rapidly, PPL Electric plans to pilot communications into the home through an in-home display (IHD) in 2011. This pilot is discussed below under the requirements for open standards and protocols.

PPL Electric already provides electronic access to price and consumption information today to customers via its website. However, the Company proposes to pilot other means of electronic access that include alerts on price and/or consumption. These proposed pilot evaluations would include tests of communication channels such as near real-time e-mail and text messages to customers. Originally, this pilot included costs for a 2010 evaluation and if feasible, an implementation of cost justified enhancements in 2011 to customers who ultimately desire this capability. Pending the issuance of an Order, the Company has continued to research options for providing this functionality and has uncovered new information on the costs to send messages to customers. Based on this information, the Company has decided to continue evaluating the available technologies in 2010 to provide this service to customers and pilot the technology in 2011 with 10,000 customers. Piloting the technology will provide the opportunity to further define the costs and benefits of sending price and usage messages to customers. The total estimated cost of this pilot is \$143,000 which includes (1) the evaluation in 2010 and pilot in 2011 of multiple communication channels (2) software and licensing and (3) evaluation of pilot results, (4) establishment of an implementation plan if so indicated by the evaluation, and (5) reporting of results and proposed implementation plan to the Commission.

In order to fully address the issues raised in the Commission's Order, the Company will undertake, in parallel with its technology pilot, an investigation into the practical issues and costs of other methods for providing customers direct access to price and consumption data. In this way, the Company expects to be able to provide a complete assessment of the incremental costs and benefits of a full spectrum of alternative means to provide this information to customers.

The Company plans to conduct a pilot that will provide customers with an in-home display that will provide them direct real-time access to their energy consumption and costs. This pilot, as scoped, will focus on understanding the technology and benefits of providing customers with direct real-time access to their energy and cost information.

4. Providing customers direct information on their hourly consumption.

PPL Electric provides its customers with access to information on hourly consumption from its AMI. This data is provided on a daily basis to the PPL Electric meter data management system to enable customers to access their individual information on the web.

5. Enabling time-of-use rates and real-time price programs.

PPL Electric's currently deployed AMI is capable of providing hourly data to enable the Company to offer time-of-use ("TOU") rates and real-time price programs to its customers. The existing meter population already is delivering billing quality hourly data at a high success rate for TOU applications as part of a pilot involving over 800 customers. In March 2010, the Company began providing TOU rate options to all residential and small commercial and industrial ("Small C&I") customers who desire this rate option.

Regarding real-time pricing programs, PPL Electric's currently deployed AMI is capable of accommodating the capture and retrieval of hourly data in accordance with PJM hourly pricing. Beginning January 1, 2010, these programs were offered to Large C&I customers taking delivery at primary voltage and above. Beginning in January 2011, the Company will offer this option to all customers with demands that are greater than 500 kW. An evaluation was completed in early 2010 to determine if the power line meters could provide adequate data to bill real-time pricing to customers with demands greater than 500 kW. Although the performance evaluation did not find any significant issues with regard to data collection, there are currently limitations within the billing system that must be addressed before power line meters can be used for real-time pricing. Therefore, PPL Electric determined that it was most cost-effective to read those accounts with demands greater than 500 kW with the large power meter wireless system. This amounted to 320 accounts and was completed in 2010 outside of the Plan.

6. Supporting the automatic control of the customer's electric consumption.

PPL Electric plans to conduct a pilot in 2011 to exercise the capabilities of the AMI currently deployed to automatically control individual customer's electric consumption. This will be accomplished by installing load control devices on certain customer equipment, including air conditioning systems and water heaters. Preparation for this pilot began in 2010 and the pilot will run during the summer of 2011. This pilot originally was intended for 2010, but has been delayed in order to permit evaluation of emerging

technology and final approval of the Company's Smart Meter Plan. This pilot will also investigate and report on the feasibility, costs, and benefits of various means by which 3rd parties can exercise control over the load control devices.

The estimated cost of the pilot is \$507,200 and includes, (1) establishment of pilot objectives, (2) invitations to 500 customers to participate in the pilot, (3) purchase and installation of load control devices, (4) software, programming and licensing, (5) evaluation of pilot results, (6) establishment of an implementation plan if so indicated by the evaluation, and (7) reporting of results and proposed implementation plan to the Commission. Approximately \$93,200 will be spent in 2010 to prepare for the pilot and \$414,000 will be spent in 2011 to conduct the pilot.

If the feasibility of the technology as well as its economic viability is confirmed, wider potential deployment with an anticipated 5,000 customer enrollment annually may result in estimated implementation cost of \$7,772,500 from 2011-2014.

The pilot and implementation costs have changed due to higher than expected equipment costs. Implementation will be dependent on the benefits of the program.

7. Ability to remotely disconnect and reconnect.

This functionality is supported by PPL Electric's current AMI deployment. Remote disconnection and reconnection can be accomplished through the use of a meter with a service disconnect integrated into either the meter or a disconnect collar installed at the customer's premise.

PPL Electric proposes to conduct a remote disconnection/reconnection pilot in 2011 to connect and disconnect premises where frequent move ins/move outs occur in its service territory. The pilot will enable "hard" blocking of all accounts in the pilot, excluding terminations for non-payment.

The estimated cost of the pilot is \$210,000, which includes: (1) establishment of pilot objectives, (2) invitation to 500 customers to participate in the pilot, (3) meter hardware and installation, (4) software and programming, (5) evaluation of pilot results, (6) potential establishment of an implementation plan if required, and (7) reporting of results and proposed implementation plan to the Commission.

If the pilot is successful, wider deployment to an estimated 50,000 customer locations from 2012-2014 may result in estimated implementation cost of \$13,225,000.

8. Ability to provide 15-minute or shorter interval data.

PPL Electric's smart meter infrastructure system can support the provision of 15-minute or shorter interval data. PPL Electric understands that 15-minute interval data may have benefits to EGSs and third parties in designing rates and in demand-reduction programs. However, more granular 5 and 10-minute intervals appear to have value only in specialized applications. The Company has used higher resolution data captured from a premise for short periods to investigate customer complaints or power

delivery issues, rather than dispatching a technician and leaving expensive equipment at the premise. However, to provide data in a more granular format routinely to large numbers of customers will significantly increase the cost of the system; especially from a data storage standpoint. Therefore, the Company believes that it is not practical or economical to implement higher resolution interval data for its entire meter population, but, instead, to pursue situations where it makes good economic sense and where third parties may require it for dispatch, energy consumption reconciliation or billing.

PPL Electric is conducting a pilot in 2010 to assess the capability to provide 15-minute interval data on a consistent basis using power line meters that have the capability to be configured for 15-minute data collection at the residential and Small C&I customer level. The estimated cost to perform this evaluation is \$134,000, which includes: (1) the remote reconfiguration of 500 installed power line meters from 60-minute to 15-minute collection, (2) a scalability test to determine if PPL Electric's power line system can read 15-minute data from all Small C&I accounts (180,000 accounts), (3) evaluation of pilot results, (4) development of recommendations including consideration of process changes necessary to accept customers', EGSs', and/or 3rd parties' requests for 15-minute data, and (5) reporting of results and an implementation plan to the Commission.

The objectives of the evaluations are to determine (1) the ability of the power line smart meter infrastructure to provide 15-minute interval data on a consistent basis using meters with additional functionality at the Small C&I level, (2) determine the feasibility of providing 15-minute interval data to all Small C&I customers, and (3) evaluate the benefits associated with providing such granular data to customers to determine if the benefits are sufficient to justify the cost.

In addition to reporting the pilot results, PPL Electric will provide responses to the following questions that were set forth in the Commission's June 24 Order:

- What are the capability and limitations of proposed smart meters to measure and record sub-hourly usage?
- What are the capability and limitations of proposed smart meter communication and data storage systems to transmit and store sub-hourly usage information?
- What are the sub-hourly PJM requirements for participation in ancillary service markets?
- What are PPL's incremental smart meter, communication, data storage, and data sharing costs associated with these sub-hourly requirements for ancillary services?
- What are the incremental equipment and installation costs of pulse data recorders used to measure sub-hourly meter data?
- Is a pulse data recorder attached to PPL's meter sufficiently accurate for use by PJM in its ancillary markets, or is redundant metering required to meet PJM standards?

- What are the additional customer costs associated with (1) transferring pulse meter information from the meter to inside the customer's premise, (2) processing this data into usable format, (3) communicating the data to a third party or PJM?
- To the extent a customer requests sub-hourly data, what, if any cost recovery charge is appropriate. For example, would it be appropriate to have a customer charge that varies with the level of sub-hourly metering requested, and, if so, what would those sub-hourly metering charges be?

9. On-board meter storage of meter data.

PPL Electric's existing AMI utilizes meters with sufficient storage to provide billing data when required even though only 24 hours of data is stored in the meter itself. Additionally, the infrastructure complies with nationally recognized non-proprietary standards that are referenced in the Implementation Order.

The Company's plans to upgrade its meter population annually related to new construction, meter replacements and customer requests through normal purchases. The upgrades will include purchases of meters capable of storage, at the meter level, of at least 7 days of daily data and 30 days of hourly data.

Residential meters that currently are deployed in PPL Electric's AMI are capable of storing 24 values of hourly load profile data. The Company's power line smart meter system acquires that information every 8 hours on a daily basis. Newer meter modules can store over 30 days of hourly values. A pilot will be conducted beginning in 2011 and concluding in 2012 to test the ability to acquire any or all of those 30 days of data and revalidate it in the meter data management system (MDMS). There has been a slight change to the schedule of this project. Software changes to MDMS will take more time than originally expected and, therefore, the pilot has been extended to the end of 2012. The pilot includes changes in read schedule and validation processes at an estimated cost of \$130,000. The pilot includes (1) software application changes and upgrades to the smart meter infrastructure and the MDMS, (2) changes to business processes for validation, editing and estimation of billing and presentation data, (3) software and programming, (4) evaluation of pilot results, (5) development of an implementation plan, and (6) reporting of results and an implementation plan to the Commission.

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

The Company's current AMI deployment can support the open standards and protocols that are recognized nationally. PPL Electric plans to continue incorporating open standards and protocols into the Company's use of smart meter technology. It will accomplish this by monitoring the progress of Smart Grid Standards as guided by the National Institute of Standards and Technology ("NIST") and incorporate those evolving standards into its smart meter and smart grid system.

At the time the Company initially filed its Smart Meter Plan, the Company planned to explore incorporating IEEE 802.15.4 compliant Zigbee communications into a home area network through a pilot beginning in 2010 and concluding in 2011. Instead, as the result of technology evolutions since that initial filing, the Company plans to incorporate IEEE 802.11 compliant wireless local area network (WLAN) communications into a home area network pilot. The Company believes that this protocol will be more generally accepted in the future than Zigbee communications. Although we do not have specific statistics, we believe many of the Company's customers already have WLAN in their home and devices that communicate over WLAN. An update to the Zigbee communication standard is expected to be released in late 2011, and it is not backwards compatible with the current standard. Therefore, Zigbee devices on the market today will be obsolete by the end of next year. The pilot will provide customers with an in-home display that they can purchase at any retail electronics outlet (i.e., store, web, etc.). There is the potential for future pilots in this area that would incorporate the ability to control customers' end-use devices such as thermostats and appliances, but this pilot, as scoped, will focus on understanding the technology and benefits of providing customers with direct real-time access to their energy and cost information.

The estimated cost of this pilot is \$305,500 which includes (1) establishment of pilot objectives, (2) providing price and consumption information to the customer, (3) evaluate bi-directional communications to end-use devices, (4) inviting 500 customers to participate in the pilot, (5) providing the meter and home display hardware including any equipment installation, (6) software and programming, (7) evaluation of pilot results and development of an implementation plan, and (8) reporting of results to the Commission.

If the pilot confirms the feasibility and economic viability of this approach, then a potential annual deployment to an anticipated 10,000 customer enrollment from 2012-2014 may result in a total estimated implementation cost of \$3,965,000.

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

PPL Electric's smart meter infrastructure possesses the ability to upgrade firmware and communication systems for compliance with new standards and protocols. The Company's plan addresses technology advances in five areas. Each is discussed below.

General Obsolescence and Upgrade Issues

Over the next five years, PPL Electric will conduct technological and economic evaluations on potential applications that can enhance the performance of the existing AMI components, as well as the next generation of smart meter system technologies and Smart Grid integration. These evaluations will consider the obsolescence of the communications infrastructure equipment and meters, and their replacement with new technology that enables PPL Electric to extend the minimum requirements and support

the additional capabilities required by the Commission. Additionally, the Company will consider new applications that complement the capabilities of the existing system.

The estimated costs to conduct these evaluations are \$350,000, which includes: (1) evaluation in 2011 of the existing power line smart meter infrastructure and its ability to support enhancements that may extend the minimum requirements and support the other capabilities, (2) evaluation of Smart Grid Integration over the period from 2011 to 2014 that could extend the communication infrastructure's capability to backhaul AMI/Smart Grid data more effectively, (3) consideration of additional or new equipment to enhance data capture and accommodate new end-use devices, (4) continual evaluation of the next generation of AMI technologies for applicability over the 2010 through 2014 time period, and (5) reporting results and potential implementation plans to the Commission. If the evaluations result in recommendations to implement technologies that improve system performance, the potential cost to deploy is estimated at \$4,560,000.

The results of these evaluations could enable PPL Electric to avoid the complete replacement of its AMI, which is estimated to cost between \$380 and \$450 million depending on the functionality and system deployed. The Company believes that the implementation costs for simply upgrading its existing AMI's meter reading application and associated IT related hardware will be only about \$3 million.

Momentary Outage Monitoring

PPL Electric currently captures and reports customer momentary interruption data ("blink counts") which can be used to resolve customer power quality issues. In fact, PPL Electric personnel are currently using these blinks to resolve customer complaints regarding power quality and reliability. The Company expects to continue the use of these blink counts and become more proactive in understanding emerging power quality issues and address them prior to a customer contacting PPL Electric. This would be accomplished through the aggregation of blink count data in a meaningful way to aid in determining the approximate date, time, and location of the device that operated to cause the "blink". A pilot will be conducted beginning in 2011 with potential implementation of initiatives in 2012. The objectives of the pilot will be to (1) develop and enhance business processes that actively review customer blink information, (2) determine the most likely time and location of a momentary operation, (3) ascertain how the customer blink information can be incorporated into PPL Electric's outage management system to refine PPL Electric's outage detection analysis and post outage restoration, and (4) assure that automation of the processes is implemented for ease of application of the information for all business users.

The estimated cost to conduct this pilot is \$100,000, which includes, (1) establishment of evaluation objectives, (2) software and IT programming, (3) evaluation of the results, (4) establishment of recommendations for implementation, and (5) reporting results and plan to the Commission. If the pilot is successful, implementation of proactive momentary outage capture will result in an estimated cost of \$100,000 in the 2012 to 2013 period.

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

PPL Electric collects voltage information as required for specific engineering review. Industrial and commercial meters also offer more precise voltage, current and relational phase-angle information and the Company uses this information to diagnose meter and service issues.

PPL Electric will use the power line carrier ("PLC") based existing smart meter technology and infrastructure to improve the measurement, collection and analysis of voltage information to enhance PPL Electric's distribution system reliability. Also, its wireless based large power meters offer more precise voltage, current and relational phase-angle information and the Company will be enhancing the use of that information for the diagnosis of meter and service issues. To further the use and expansion of these two systems for voltage monitoring and reporting, this enhancement will be implemented in 2010 for the large power meters and a pilot will be conducted in 2010 and 2011 with the power line carrier (PLC) based system. The estimated cost of the large power meter information enhancement is \$100,000 and the pilot is \$100,000 which includes, (1) determining the feasibility of gathering this new information by performing an impact analysis on the smart meter infrastructure to ensure there are no performance issues, (2) exporting the data collected into a meter data management system to provide a facility for engineers to access and apply the data in business applications, (3) software and IT programming, (4) establishment of implementation plan, and (5) reporting the results and implementation plans to the Commission.

The enhancement to the large power meters is in progress and will be completed by the end of 2010. The Company has begun preparing for the PLC based pilot in 2010 to better coordinate defining the Company's voltage requirements. The Company's Smart Meter Team and its Smart Grid Team are coordinating efforts to determine the most cost-effective approach to meeting the Company's voltage requirements. If the PLC based pilot is successful, it is expected that implementation will occur in 2012 at an estimated cost of \$125,000.

13. Ability to remotely reprogram the meter.

PPL Electric has the ability with its smart meter infrastructure to remotely program equipment and meters in the system. The Company has demonstrated this capability in several applications.

14. Ability to communicate outages and restorations.

The Company's current deployment is integrated with its Outage Management System ("OMS") to permit a more accurate determination of the extent of an outage and provide the ability to restore customers more quickly than would otherwise be possible. As it moves forward with its Smart Meter Plan, PPL Electric will continue to seek ways to incrementally improve proactive outage detection over the life of the systems.

PPL Electric will define roadmaps and conduct a pilot to further enhance use of the existing AMI's capabilities in 2010. The objective of the pilot will be to determine the system-wide feasibility of using the power line system for proactive meter outage detection for the purpose of distribution system health checks and active outage detection.

The estimated cost of the pilot is \$100,000, which includes (1) improving the accuracy of existing meter queries ("pings") through the investigation and mitigation of performance issues, (2) modification of the OMS to proactively "ping" customers' meters to assess service health, and (3) optimize ping services to more actively assess outage conditions and dispatch personnel where required. If the pilot is successful, it is expected that implementation will occur in 2011 at an estimated cost of \$170,000. This cost has increased from the Company's original estimate due to higher than expected vendor costs.

15. Ability to support net metering of customer-generators.

The smart meter infrastructure employed by PPL Electric supports this capability and is utilized today to acquire all the point of contact and generation quantities.

PPL Electric will pilot, in 2010 and 2011, the functionality and performance of new bi-directional meters in its infrastructure that measure energy flow at the PPL Electric point of contact. The pilot will consist of using 400 bi-directional meters in the power line smart meter system that will provide net energy usage on an interval basis measuring both delivered and received energy flowing to the Company's grid. In addition, there will be changes required to PPL Electric's MDMS and customer information and billing system to accept delivered and received energy usage.

The estimated cost to conduct this pilot is \$238,600 which includes, (1) upgrading existing net metering customers with the new power line meter, (2) meter hardware and installation, (3) software and IT programming to accept new energy data, (4) evaluation of pilot results, (5) development of an implementation plan and (6) reporting results and an implementation plan to the Commission. Implementation will be required to fully support net metering for customers with generation installed. Implementation costs are estimated at \$285,000 in 2011. This will not include installing new meters. Implementation will include required software changes to the Company's AMI, MDMS and customer information and billing systems.

Costs for this pilot and implementation have changed as a result of further evaluation of the net metering requirements and the need to update IT systems beyond the simple change-out of meters. The Company has found that the new standard power line meter can retrieve all necessary net energy flow data, but that the backend systems could not handle net energy flow. In addition, the Company will implement new business processes to ensure that new net metering customers have the correct meter installed and that the meters of existing net metered customers are changed as appropriate. The cost of meter changes will be recovered through base rate proceedings outside of the

plan. This eliminates the need for capital expenditures in 2012 through 2014 in the Smart Meter Plan.

IV. CONCLUSION

As explained above, PPL Electric has made several modifications to its original Smart Meter Plan filing in response to the Commission's June 24 Order and, also, in response to technology evolutions that have occurred since the Company initially filed its Plan. PPL Electric is working to ensure that it provides its customers all of the smart meter functionality required under Act 129 in a cost-effective manner. As explained herein, PPL Electric is delaying the filing of its Smart Meter Rider for the recovery of costs associated with this Plan in order to give the Commission the opportunity to rule on the OCA's Petition for Reconsideration regarding allocation of non-direct costs. However, in the event that the Commission does not rule on the OCA's Petition for Reconsideration by its Public Meeting now scheduled for September 2, 2010, PPL Electric will file its Smart Meter Rider at that time.

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ATTACHMENT 1

PPL Electric Utilities Smart Meter Milestone Plan

ATTACHMENT 1

PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(1): Bidirectional data communications capability	-	-	-	-																
1. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-									-	-	-	-	-	-	-	-
6 B(2): Recording usage data on an hourly basis at least once per day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. PPL Electric does not anticipate any incremental costs to be expended except for meter replacement under normal conditions such as damage to the meter, defective meters and customer requests.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(3): Provide customers with direct access to price and consumption information	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Messaging - Price and usage information	-	-																		
- Evaluate various channels of customer communications	-	-																		
- Implementation	-	-											-	-	-	-	-	-	-	-
2. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-									-	-	-	-	-	-	-	-
6 B(4): Provide customers with information on their hourly consumption	-																			
1. Work with customers, EGSs and third parties to provide hourly consumption that is in clear and understandable formats. Estimated costs to be quantified later during 30 month grace period.	-												-	-	-	-	-	-	-	-
6 B(5): Enabling TOU and RTP Price Programs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Demonstration of capability to comply with this requirement for RTP with industrial and commercial accounts 500 KW and greater to be completed in conjunction with work to be done in Section 6 C(2). Evaluation was completed outside the Smart Meter Plan and PPL Electric determined that the most cost effective way to provide RTP to this customer class is through the wireless based large power meter system.	-																			

PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(6): Supporting automatic control if the customer's electric consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Load Control Evaluation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot of 500 Customer installations ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- System Implementation ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Capabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(1): Remote disconnection and reconnection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot- 500 customer installations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(2): Ability to provide 15 minute or shorter interval data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Performance evaluation of Focus UMT-r meters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot with 500 meters ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(3): On-board meter storage of meter data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Ability to read historical data/process IT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Design/development & pilot with Aclara	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- MDM capability to upload and re-VEE data ⁴	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(4): Open standards and protocols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. In-Home Display/Home Area Network	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Evaluate available technologies and requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct Pilot with 500 customers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(5): Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. General Obsolescence and Upgrade Issues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Next generation PLC based system evaluation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Potential next generation PLC based system implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

¹ Pilot is delayed due to emerging technology developments and final approval of the plan.

² Implementation is delayed due to the pilot delay.

³ Pilot is advanced to provide adequate time to complete a thorough cost benefit analysis and address Commission's eight additional questions about 15-minute interval data.

⁴ MDM software changes will take more time than originally expected. This pilot is extended two quarters.

PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Evaluation next generation AMI technologies/Smart Grid integration	-																			
- Assessment of existing PLC based functionality	-																			
- Telecommunications Substation Modem evaluation & replacement	-																			
- Real Time Path mapping in PLC based system	-	-	-	-																
» Evaluate feasibility and potential design	-	-	-	-																
» Implement/evaluate results of proof of concept design	-	-	-	-																
» Implement full scale	-	-	-	-																
- PLC based system enhancements	-	-	-	-																
a. Consider addition of Modulation Transformer Units(MTU)	-	-	-	-																
» Evaluate the benefits for additional MTUs	-	-	-	-																
» Install MTUs	-	-	-	-																
b. Consider deployment of SCPA G2 Boards	-	-	-	-																
» Evaluate the benefits for new SCPA boards	-	-	-	-																
» Install SCPA boards	-	-	-	-																
2. Service Extending	-	-	-	-																
- Conduct pilot - 500 customers	-	-	-	-																
3. Prepay Metering	-	-	-	-																
- Conduct pilot - 500 customers	-	-	-	-																
- Implementation	-	-	-	-																
4. Momentary Outage Monitoring	-	-	-	-																
- Conduct pilot	-	-	-	-																
- Implement recommendations	-	-	-	-																

PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(6): Ability to monitor voltage at each meter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Wireless-based system enhancement	-	■	■	■																
2. Voltage measurement/collection/ reporting in PLC-based system	-																			
- Pilot ⁵	-		■	■	■	■	■	■												
- Full scale implementation	-								■	■	■	■	■	■	■	■				
6 C(7): Remote programming capability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
To be demonstrated in conjunction with work to be completed in Section 6 C(5).	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(8): Communicate outages and restorations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Proactive outage detection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Assess options to determine how to become more proactive with outage detection	-	■	■																	
- Implement plan	-				■	■	■	■	■	■	■	■	■	■	■	■				
6 C(9): Ability to support net metering of customer generators	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Evaluate feasibility customer owned generation with TNS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot with Focus UMT-r meters - 400 meters (existing net metering customers that do not have a Focus UMT-r meter installed) ⁶	-		■	■	■															
- Implementation ⁷	-					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Program Management		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Legend																				
Pilot/evaluation	■																			
Potential implementation		■																		

⁵ Pilot is extended to better coordinate defining the Company's voltage requirements. The Smart Meter Team and the Smart Grid Team are coordinating efforts to determine the Company's voltage requirements.

⁶ Pilot will take longer than expected due to resource constraints for changing meters. Meters will be changed between November 2010 and April 2011.

⁷ Electric will need to implement business process and billing system changes to fully support net metering for customer generators.

ATTACHMENT 1

PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(1): Bidirectional data communications capability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(2): Recording usage data on an hourly basis at least once per day	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. PPL Electric does not anticipate any incremental costs to be expended except for meter replacement under normal conditions such as damage to the meter, defective meters and customer requests.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(3): Provide customers with direct access to price and consumption information	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Messaging - Price and usage information	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Evaluate various channels of customer communications	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(4): Provide customers with information on their hourly consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Work with customers, EGSs and third parties to provide hourly consumption that is in clear and understandable formats. Estimated costs to be quantified later during 30 month grace period.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(5): Enabling TOU and RTP Price Programs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Demonstration of capability to comply with this requirement for RTP with industrial and commercial accounts 500 KW and greater to be completed in conjunction with work to be done in Section 6 C(2). <u>Evaluation was completed outside the Smart Meter Plan and PPL Electric determined that the most cost effective way to provide RTP to this customer class is through the wireless based large power meter system.</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 B(6): Supporting automatic control if the customer's electric consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Load Control Evaluation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot of 500 Customer installations ¹	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- System Implementation ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Capabilities	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(1): Remote disconnection and reconnection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot- 500 customer installations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(2): Ability to provide 15 minute or shorter interval data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Performance evaluation of Focus UMT-r meters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot with 500 meters ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(3): On-board meter storage of meter data	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Ability to read historical data/process IT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Design/development & pilot with Aclara	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- MDM capability to upload and re-VEE data ⁴	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(4): Open standards and protocols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. In-Home Display/Home Area Network	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Evaluate available technologies and requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct Pilot with 500 customers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(5): Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. General Obsolescence and Upgrade Issues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Next generation PLC based system evaluation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Potential next generation PLC based system implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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¹ Pilot is delayed due to emerging technology developments and final approval of the plan.

² Implementation is delayed due to the pilot delay.

³ Pilot is advanced to provide adequate time to complete a thorough cost benefit analysis and address Commission's eight additional questions about 15-minute interval data.

⁴ MDM software changes will take more time than originally expected. This pilot is extended two quarters.

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PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Evaluation next generation AMI technologies/Smart Grid integration	-	-	-	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
- Assessment of existing PLC based functionality	-	■	■	■																
- Telecommunications Substation Modem evaluation & replacement	-	■	■	■	■	■	■	■												
- Real Time Path mapping in PLC based system	-	-	-	-	■	■														
» Evaluate feasibility and potential design	-	-	-	-	■	■														
» Implement/evaluate results of proof of concept design	-	-	-	-			■	■												
» Implement full scale	-	-	-	-					■	■	■	■								
- PLC based system enhancements	-	-	-	-	-	-														
a. Consider addition of Modulation Transformer Units(MTU)	-	-	-	-	-	-														
» Evaluate the benefits for additional MTUs	-	-	-	-	-	-	■	■												
» Install MTUs	-	-	-	-	-	-			■	■	■	■	■	■	■	■	■	■	■	■
b. Consider deployment of SCPA G2 Boards	-	-	-	-	-	-														
» Evaluate the benefits for new SCPA boards	-	-	-	-	■	■														
» Install SCPA boards	-	-	-	-					■	■	■	■	■	■	■	■				
2. Service Extending	-	-	-	-	-	-														
- Conduct pilot - 500 customers	-	-	-	-	-	-							■	■	■	■	■	■	■	■
3. Prepay Metering	-	-	-	-	-	-														
- Conduct pilot - 500 customers	-	-	-	-	-	-							■	■	■	■				
- Implementation	-	-	-	-	-	-											■	■	■	■
4. Momentary Outage Monitoring	-	-	-	-	-	-														
- Conduct pilot	-	-	-	-	-	-	■	■	■	■										
- Implement recommendations	-	-	-	-	-	-			■	■	■	■								

PPL Electric Smart Meter Program Milestone Plan	2010				2011				2012				2013				2014			
	1st	2nd	3rd	4th																
Minimum Requirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(6): Ability to monitor voltage at each meter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Wireless-based system enhancement	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Voltage measurement/collection/ reporting in PLC-based system	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Pilot ⁵	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Full scale implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(7): Remote programming capability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
To be demonstrated in conjunction with work to be completed in Section 6 C(5).	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(8): Communicate outages and restorations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Proactive outage detection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Assess options to determine how to become more proactive with outage detection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Implement plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6 C(9): Ability to support net metering of customer generators	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1. Evaluate feasibility customer owned generation with TNS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Conduct pilot with Focus UMT-r meters ~400 meters (existing net metering customers that do not have a Focus UMT-r meter installed) ⁶	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Implementation ⁷	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Program Management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Legend	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pilot/evaluation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potential implementation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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⁵ Pilot is extended to better coordinate defining the Company's voltage requirements. The Smart Meter Team and the Smart Grid Team are coordinating efforts to determine the Company's voltage requirements.

⁶ Pilot will take longer than expected due to resource constraints for changing meters. Meters will be changed between November 2010 and April 2011.

⁷ Electric will need to implement business process and billing system changes to fully support net metering for customer generators.

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ATTACHMENT 2

PPL Electric Utilities Smart Meter Plan Budget

ATTACHMENT 2

PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
<u>6 B(1): Bidirectional data communications capability</u>	-	-	-	-	-	-
1. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-	-	-
<u>6 B(2): Recording usage data on an hourly basis at least once per day</u>	-	-	-	-	-	-
1. PPL Electric does not anticipate any incremental costs to be expended except for meter replacement under normal conditions such as damage to the meter, defective meters and customer requests.	-	-	-	-	-	-
<u>6 B(3): Provide customers with direct access to price and consumption information</u>	-	-	-	-	-	-
1. Messaging - Price and usage information						
- Evaluate various channels of customer communications	\$43,000					\$43,000
- Pilot		\$100,000				\$100,000
2. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-	-	-
<u>6 B(4): Provide customers with information on their hourly consumption</u>	-	-	-	-	-	-
1. Work with customers, EGSs and 3rd parties to provide hourly consumption that is in clear and understandable formats. Estimated costs to be quantified later during 30 month grace period.	-	-	-	-	-	-
<u>6 B(5): Enabling TOU and RTP Price Programs</u>	-	-	-	-	-	-
1. Demonstration of capability to comply with this requirement for RTP with industrial and commercial accounts 500 KW and greater to be completed in conjunction with work to be done in Section 6 C(2).	-	-	-	-	-	-
<u>6 B(6): Supporting automatic control if the customer's electric consumption</u>	-	-	-	-	-	-
1. Load Control Evaluation						
- Conduct pilot of 500 Customer installations	\$93,200	\$414,000				\$507,200
- System Implementation			\$2,633,500	\$2,569,500	\$2,569,500	\$7,772,500

PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
Additional Capabilities	-	-	-	-	-	-
6 C(1): Remote disconnection and reconnection	-	-	-	-	-	-
- Conduct pilot- 500 customer installations		\$210,000				\$210,000
- Implementation			\$2,645,000	\$5,290,000	\$5,290,000	\$13,225,000
6 C(2): Ability to provide 15 minute or shorter interval data	-	-	-	-	-	-
2. Performance evaluation of Focus UMT-r meters						
- Conduct pilot with 500 meters	\$82,000	\$52,000				\$134,000
6 C(3): On-board meter storage of meter data	-	-	-	-	-	-
1. Ability to read historical data/process IT						
- Design/development & pilot with Aclara		\$80,000				\$80,000
- MDM capability to upload and re-VEE data			\$50,000			\$50,000
6 C(4): Open standards and protocols	-	-	-	-	-	-
1. In-Home Display/Home Area Network						
- Evaluate available technologies and requirements	\$47,500					\$47,500
- Conduct Pilot with 500 customers		\$258,000				\$258,000
- Implementation			\$1,415,000	\$1,275,000	\$1,275,000	\$3,965,000
6 C(5): Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible	-	-	-	-	-	-
1. General Obsolescence and Upgrade Issues						
- Next generation PLC based system evaluation		\$50,000				\$50,000
- Potential next generation PLC based system implementation			\$1,500,000	\$1,500,000		\$3,000,000
- Evaluation next generation AMI technologies/Smart Grid integration		\$55,000	\$25,000	\$25,000	\$25,000	\$130,000
- Assessment of existing PLC based functionality	\$30,000					\$30,000
- Telecommunications Substation Modem evaluation & replacement	\$220,000	\$157,000				\$377,000
- Real Time Path mapping in PLC based system						
» Evaluate feasibility and potential design		\$25,000				\$25,000
» Implement/evaluate results of proof of concept design		\$50,000				\$50,000
» Implement full scale			\$150,000			\$150,000
- PLC based system enhancements						

PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
a. Consider addition of Modulation Transformer Units(MTU)						
» Evaluate the benefits for additional MTUs		\$32,500				\$32,500
b. Consider deployment of SCPA G2 Boards						
» Evaluate the benefits for new SCPA boards		\$32,500				\$32,500
» Install SCPA boards			\$420,000	\$350,400		\$770,400
2. Service Extending						
- Conduct pilot - 500 customers				\$110,000	\$110,000	\$220,000
3. Prepay Metering						
- Conduct pilot - 500 customers				\$240,000		\$240,000
- Implementation					\$3,162,500	\$3,162,500
4. Momentary Outage Monitoring						
- Conduct pilot		\$50,000	\$50,000			\$100,000
- Implement recommendations			\$50,000	\$50,000		\$100,000
6 C(6): Ability to monitor voltage at each meter						
1. Wireless-based system enhancement	\$100,000					\$100,000
2. Voltage measurement/collection/ reporting in PLC-based system						
- Pilot	\$50,000	\$50,000				\$100,000
- Full scale implementation			\$125,000			\$125,000
6 C(7): Remote programming capability						
To be demonstrated in conjunction with work to be completed in Section 6 C(5).	-	-	-	-	-	-
	-	-	-	-	-	-
6 C(8): Communicate outages and restorations						
1. Proactive outage detection						
- Assess options to determine how to become more proactive with outage detection	\$100,000					\$100,000
- Implement plan		\$170,000				\$170,000

PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
<u>6 C(9): Ability to support net metering of customer generators</u>	-	-	-	-	-	-
1. Evaluate feasibility customer owned generation with TNS						
- Conduct pilot with Focus UMT-r meters - 100 meters	\$132,400	\$106,200				\$238,600
- Implementation		\$285,000				\$285,000
Program Management	\$300,000	\$313,500	\$328,000	\$343,000	\$358,000	\$1,642,500
Total	\$1,198,100	\$2,490,700	\$9,391,500	\$11,752,900	\$12,790,000	\$37,623,200

ATTACHMENT 2

PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
6 B(1): Bidirectional data communications capability						
1. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-	-	-
6 B(2): Recording usage data on an hourly basis at least once per day						
1. PPL Electric does not anticipate any incremental costs to be expended except for meter replacement under normal conditions such as damage to the meter, defective meters and customer requests.	-	-	-	-	-	-
6 B(3): Provide customers with direct access to price and consumption information						
1. Messaging - Price and usage information						
- Evaluate various channels of customer communications	\$43,000					\$43,000
- Pilot		\$100,000				\$100,000
2. Demonstration of this functionality will be provided in conjunction with home area network pilot to be completed in Section 6 C(4).	-	-	-	-	-	-
6 B(4): Provide customers with information on their hourly consumption						
1. Work with customers, EGSs and 3rd parties to provide hourly consumption that is in clear and understandable formats. Estimated costs to be quantified later during 30 month grace period.	-	-	-	-	-	-
6 B(5): Enabling TOU and RTP Price Programs						
1. Demonstration of capability to comply with this requirement for RTP with industrial and commercial accounts 500 KW and greater to be completed in conjunction with work to be done in Section 6 C(2).	-	-	-	-	-	-
6 B(6): Supporting automatic control if the customer's electric consumption						
1. Load Control Evaluation						
- Conduct pilot of 500 Customer installations	\$93,200	\$414,000				\$507,200
- System Implementation			\$2,633,500	\$2,569,500	\$2,569,500	\$7,772,500

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PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
Additional Capabilities						
6 C(1): Remote disconnection and reconnection						
- Conduct pilot- 500 customer installations		\$210,000				\$210,000
- Implementation			\$2,645,000	\$5,290,000	\$5,290,000	\$13,225,000
6 C(2): Ability to provide 15 minute or shorter interval data						
▼						
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2. Performance evaluation of Focus UMT-r meters						
- Conduct pilot with 500 meters	\$82,000	\$52,000				\$134,000
6 C(3): On-board meter storage of meter data						
1. Ability to read historical data/process IT						
- Design/development & pilot with Aclara		\$80,000				\$80,000
- MDM capability to upload and re-VEE data			\$50,000			\$50,000
6 C(4): Open standards and protocols						
1. In-Home Display/Home Area Network						
- Evaluate available technologies and requirements	\$47,500					\$47,500
- Conduct Pilot with 500 customers		\$258,000				\$258,000
- Implementation			\$1,415,000	\$1,275,000	\$1,275,000	\$3,965,000
6 C(5): Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible						
1. General Obsolescence and Upgrade Issues						
- Next generation PLC based system evaluation		\$50,000				\$50,000
- Potential next generation PLC based system implementation			\$1,500,000	\$1,500,000		\$3,000,000
- Evaluation next generation AML technologies/Smart Grid integration		\$55,000	\$25,000	\$25,000	\$25,000	\$130,000
- Assessment of existing PLC based functionality	\$30,000					\$30,000
- Telecommunications Substation Modem evaluation & replacement	\$220,000	\$157,000				\$377,000
- Real Time Path mapping in PLC based system						
» Evaluate feasibility and potential design		\$25,000				\$25,000
» Implement/evaluate results of proof of concept design		\$50,000				\$50,000
» Implement full scale			\$150,000			\$150,000
- PLC based system enhancements						

- Deleted: 1. Evaluate scalability in PLC based system
- Deleted: - Performance evaluation for 800 meters >500 KW
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- Deleted: - Potential TNS to MV-90 Meter Conversion
- Deleted: \$510,000
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PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
a. Consider addition of Modulation Transformer Units(MTU)						
» Evaluate the benefits for additional MTUs		\$32,500				\$32,500
b. Consider deployment of SCPA G2 Boards						
» Evaluate the benefits for new SCPA boards		\$32,500				\$32,500
» Install SCPA boards			\$420,000	\$350,400		\$770,400
2. Service Extending						
- Conduct pilot - 500 customers				\$110,000	\$110,000	\$220,000
3. Prepay Metering						
- Conduct pilot - 500 customers				\$240,000		\$240,000
- Implementation					\$3,162,500	\$3,162,500
4. Momentary Outage Monitoring						
- Conduct pilot		\$50,000	\$50,000			\$100,000
- Implement recommendations			\$50,000	\$50,000		\$100,000
6 C(6): Ability to monitor voltage at each meter						
1. Wireless-based system enhancement	\$100,000					\$100,000
2. Voltage measurement/collection/ reporting in PLC-based system						
- Pilot	\$50,000	\$50,000				\$100,000
- Full scale implementation			\$125,000			\$125,000
6 C(7): Remote programming capability						
To be demonstrated in conjunction with work to be completed in Section 6 C(5).						
6 C(8): Communicate outages and restorations						
1. Proactive outage detection						
- Assess options to determine how to become more proactive with outage detection	\$100,000					\$100,000
- Implement plan		\$170,000				\$170,000

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- Deleted: - Pilot on wireless-based systems for 5 feeders with 20 meters per feeder
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- Deleted: - Pilot expansion to PLC-based systems on 5 feeders with 20 meters per feeder
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- Deleted: - Plan implementation
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PPL Electric Smart Meter Program Budget	2010	2011	2012	2013	2014	Total
Minimum Requirements						
6 C(9): Ability to support net metering of customer generators	-	-	-	-	-	-
1. Evaluate feasibility customer owned generation with TNS						
- Conduct pilot with Focus UMT-r meters - 100 meters	\$132,400	\$106,200				\$238,600
- Implementation		\$285,000				\$285,000
Program Management	\$300,000	\$313,500	\$328,000	\$343,000	\$358,000	\$1,642,500
Total	\$1,198,100	\$2,490,700	\$9,391,500	\$11,752,900	\$12,790,000	\$37,623,200

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ATTACHMENT 3

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6B(1)

Bidirectional Data Communications

Pilot/Evaluation	<ul style="list-style-type: none">• Perform evaluations using in-home displays with home area networks in coordination with the pilot referenced in section 6C(4)
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• Estimated cost of this evaluation is embedded in costs outlined in Section 6C(4)
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Establish pilot objectives,• Provide price and consumption information to the customer to aid in making energy efficient buying decisions• Demonstrate control of customer end use devices,• Evaluate bidirectional communications to these devices• Invite 500 customers to participate in the pilot• Provide the meter and home control/display hardware including any equipment installation• Develop/implement required software and IT programming changes• Evaluate pilot results and establish a potential implementation plan• Report results to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Contributes to the reduction of energy consumption through “conservation smart” automated home controls• Provides the basic hardware foundation for special rate initiatives such as critical peak pricing• Enables customers to understand and control of consumption

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6B(2)

Recording hourly usage data on at least an hourly basis

Pilot/Evaluation	<ul style="list-style-type: none">• None to be performed because we meet this requirement with the existing power line and large power smart meter systems.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• Not applicable.
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Continue to deploy meters for new construction, upon customer request, and to replace damaged and defective meters.
High Level Benefits	<ul style="list-style-type: none">•

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6B(3)

Provide customers with direct access to and use of price and consumption information

Pilot/Evaluation	<ul style="list-style-type: none">• Perform evaluations using in-home displays with home area networks in coordination with the pilot referenced in section 6C(4).• Another initiative is intended to evaluate and pilot various communication mediums. PPL Electric already provides electronic access to price and consumption information today via their website and through EDI transactions. However, the Company would like to experiment with enhancements that include alerts on price and/or consumption, as well as rate comparisons. These proposed pilot evaluations would include tests of communication channels such as near real-time email and text messages to customers.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$143,000 to evaluate and pilot various communications mediums
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Evaluation of available technologies in 2010• Pilot in 2011 of the following:<ul style="list-style-type: none">○ Messaging to multiple communication channels○ Deploy rate comparison tool to provide customers with ability to compare rate options○ Deployment of software and required licensing from chosen vendor
High Level Benefits	<ul style="list-style-type: none">• Customers will derive increased understanding and awareness of energy usage, which lead to better energy management.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6B(4)

Provide customers with information on their hourly consumption

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric provides its customers with information on hourly consumption from its AMI. This data is provided on a daily basis to the PPL Electric meter data management system that enables customers to access their individual information on the web.• The Company understands that this information may not be in a format that is easily usable for certain customer applications. Thus, during the 30 month period, the Company plans to work with customers, EGSs and third parties to provide hourly consumption that is in clear and understandable formats.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• The high level costs have not been quantified presently and will be provided through the periodic reviews with the Commission during the 30 month grace period.
Pilot/Evaluation Plan	<ul style="list-style-type: none">• To be determined and reported back to the Commission staff within the 30 month grace period
High Level Benefits	<ul style="list-style-type: none">• To be determined and reported back to the Commission staff within the 30 month grace period

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

**6 B(5)
Enabling TOU and RTP Programs**

Pilot/Evaluation	<ul style="list-style-type: none">• In 2010, conduct a performance evaluation with the Company's AMI to determine the feasibility of collecting and delivering 15-minute data at a high success rate for RTP billing for large power customers greater than 500 KW in demand. This evaluation will be conducted in coordination with Evaluation #1 discussed in Section 6C(2). Due to billing system limitations for real-time pricing, PPL Electric determined that it was most cost effective to read the accounts with greater than 500 kW demand with the large power meter wireless system. This amounted to 320 accounts and was completed in 2010 outside of the Plan.• We expect modest investments may be incurred over the 30 month period to potentially enhance TOU and hourly data delivery through pilot installations of meters with additional storage. This will allow the company to evaluate the collection and capture of historical data for billing and presentation purposes. This evaluation will be conducted in 2012 in coordination with the pilot referenced in Section 6C(3).
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• Estimated cost of the historical data collection evaluation is embedded in the costs outlined in Section 6C(3)
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Plans are as discussed in Sections 6C(2) and 6C(3)
High Level Benefits	<ul style="list-style-type: none">• As outlined in Sections 6C(2) and 6C(3).

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6 B(6)

Supporting the automatic control of the customer's electric consumption

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric will be conducting a pilot to further extend the benefits of the currently deployed AML to demonstrate how it meets this minimum requirement. This will be accomplished by installing load control devices air conditioning systems and water heaters.. The pilot is expected to be started in 2010 and completed in 2011.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$507,200
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Establish pilot objectives• Invite 500 customers to participate in the pilot• Purchase and install load control devices• Develop/implement required software and IT programming changes and licensing• Evaluate pilot results• Establish potential implementation plan• Report results and proposed implementation plan to the Commission
High Level Benefits	<ul style="list-style-type: none">• Allows customer to take advantage of TOU rate options• Enables customers to shed load during periods of peak pricing• Provides capability for PPL Electric to shed load during emergency load reduction events called by PJM to maintain system reliability• Can supplement PPL Electric peak reduction requirements mandated by the Act 129 EE&C Plan.
Potential Implementation	<ul style="list-style-type: none">• If the pilot is successful, then a potential deployment with an anticipated 5,000 customer enrollment annually may result in total estimated implementation cost of \$7,772,500 from 2011-2014.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(1)

Ability to remotely disconnect and reconnect

Pilot/Evaluation	<ul style="list-style-type: none"> • PPL Electric will conduct a remote disconnection/reconnection pilot in 2011 to connect and disconnect premises where frequent move in/move outs occur in its service territory. The pilot would enable “hard” blocking of all accounts in the pilot, excluding terminations for non-payment.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$210,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Establish pilot objectives • Invite 500 customers to participate in the pilot • Purchase of meter hardware and installation • Develop/implement required software and IT programming changes and licensing • Evaluate pilot results • Establish potential implementation plan • Report results and proposed implementation plan to the Commission
High Level Benefits	<ul style="list-style-type: none"> • Contributes to the reduction in consumption on inactive meters • Eliminates need to dispatch personnel to disconnect and reconnect • Provides ability to comply with Commission regulations in normal connect/disconnect situations • Provides ability to enable cold load pickup resulting from emergency load reductions or in large storm restoration effort • Automates the process for completing connects and disconnects • Has the potential to support emergency load reductions as directed by PJM and/or PPL Electric’s Systems Operations especially where automatic switching is not available.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful, then a potential deployment to an estimated 50000 customer locations from 2012 - 2014 may result in total estimated implementation cost of \$13,225,000.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(2)

Ability to provide 15-minute or shorter interval data

Pilot/Evaluation	<ul style="list-style-type: none"> • • A pilot will be conducted in 2010 to consistently provide 15-minute interval data in the power line smart meter infrastructure using installed meters that have the capability to be configured for 15-minute data collection at the small commercial customer level. In addition, a scalability test will be completed to determine if PPL EU's power line system can handle reading 15-minute data from all small commercial accounts without significant investment into the power line system.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$134,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • <ul style="list-style-type: none"> ○ Remote reconfiguration of installed newer smart meters from 60 minute to 15-minute collection ○ Scalability test ○ Evaluate pilot results ○ Development of recommendations ○ Report results and an implementation plan to the Commission.
High Level Benefits	<ul style="list-style-type: none"> • Demonstrate how PPL Electric tested enhancements will meet the needs of customers, third party aggregators and EGS's for interval data of 15-minutes or less • Allows customers to improve their ability to shop for a generation supplier with more precise load data.
Potential Implementation	<ul style="list-style-type: none"> ○ • If the scalability test fails, PPL EU will need to determine how to proceed with providing 15-minute interval data to small commercial customers after customer requests for 15-minute data reach a certain threshold.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(3)

On board meter storage of meter data

Pilot/Evaluation	<ul style="list-style-type: none">• A pilot will be conducted beginning in 2011 and concluding in 2012 to test the ability to acquire any or all of those 30 days of data and revalidate it in the meter data management system(MDMS).
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$130,000
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Implement software application changes and upgrades to the smart meter infrastructure and the MDMS• Implement changes to business process for validation, editing and estimation of billing and presentation data• Develop/implement required Company software and IT programming changes• Evaluate pilot results• Development of a potential implementation plan• Report results and proposed implementation plan to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Tests the operation and performance of the meters' extended memory capabilities• Demonstrates the ability to support the on-board storage capability• Provides the ability to re-acquire lost data for more accurate billing information and data presentment
Potential Implementation	<ul style="list-style-type: none">• None planned except for deploying normally purchased new meters to meet this requirement going forward in the smart meter plan. This plan will provide smart meters for new construction, customer requests, and replacement of damaged and defective meters.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(4)

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

Pilot/Evaluation	<ul style="list-style-type: none">• Conduct a home area network pilot trial beginning in 2010 and concluding in 2011 to develop the appropriate technology that meets customer requirements and expectations. The pilot will incorporate IEEE 802.11 compliant wireless local area network (WLAN) communications.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$305,500
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Establish pilot objectives• Provide price and consumption information to the customer to aid in making energy efficient buying decisions• Evaluate bidirectional communications to the end use devices• Invite 500 customers to participate in the pilot• Provide the meter and home display hardware including any equipment installation• Develop/implement any required software and IT programming changes• Evaluate pilot results• Development of a potential implementation plan• Report results and proposed implementation plan to the Commission
High Level Benefits	<ul style="list-style-type: none">• Contributes to the reduction of energy consumption through "conservation smart" automated home controls• Provides the basic hardware foundation for special rate initiatives such as critical peak pricing• Enables the customer to understand and control their energy consumption.
Potential Implementation	<ul style="list-style-type: none">• If the pilot is successful, then a potential annual deployment to an anticipated 10,000 customer enrollment from 2012 - 2014 may result in a total estimated implementation cost of \$3,965,000.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>General Obsolescence and Upgrade Issues</p> <ul style="list-style-type: none"> Over the next 5 years, PPL Electric will conduct technological and economic evaluations that can enhance the performance of the existing AMI components as well as on next generation smart meter system technologies and Smart Grid integration over the next five years. These evaluations will consider obsolescence of the communications infrastructure equipment and meters, replacement with new technology that enable PPL Electric to extend the minimum requirements and support the additional capabilities.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> \$350,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> Evaluate the existing power line smart meter infrastructure in 2011 that extend the minimum requirements and support the additional capabilities as well as the PPL proposed enhancements Evaluate Smart Grid Integration over the period from 2011 to 2014 that extend the communication infrastructure's capability to backhaul AMI/Smart Grid data more effectively Consider additional or new smart meter infrastructure equipment to enhance data capture and accommodate new end use devices Continually evaluate the next generation of AMI technologies for applicability at PPL. Periodically report results and potential implementation plans to the Commission.
High Level Benefits	<ul style="list-style-type: none"> Effectively manage obsolescence of existing smart meter infrastructure Positions PPL electric for additional capabilities including Smart Grid related applications and operations Improves efficiency in backhauling advanced meter data, Avoids an investment of \$380 to \$450 million to deploy a new smart meter system and meters resulting in lower cost recovery from customers.
Potential Implementation	<ul style="list-style-type: none"> If the evaluations result in recommendations to implement technologies that improve system performance, the potential cost to deploy is estimated at \$4,560,400.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>Service Limiting/Service Extending</p> <ul style="list-style-type: none"> • PPL Electric will conduct a pilot to deploy this enhanced capability at 500 customer accounts from 2013 through 2014. This pilot will enable PPL Electric to evaluate the effectiveness and potential benefits of this capability for payment troubled customers, while addressing the public policy issues dealing with Commission regulations.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$220,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Establish pilot objectives • Deploy at 500 selected customer locations • Purchase and installation of meter hardware with an integrated disconnect and service extending feature • Develop/implement required software and IT programming changes • Evaluate pilot results • Development of recommendations for implementation • Periodically report results and a proposed implementation plan.
High Level Benefits	<ul style="list-style-type: none"> • Maintain service to and reduce revenue loss from customers with an inability to pay their bills • Improves customer payment behavior resulting in lower service termination and revenue loss • Provides basic current (amperage) levels for essential loads to keep customers in service from April 1st to November 30th resulting in a lower revenue loss • Lowers costs by reducing the need to dispatch personnel to disconnect and reconnect because the customer possesses the control to disconnect/reconnect themselves safely when the current threshold is exceeded.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful and approval is provided by the Commission, implementation will occur beyond the 5 year plan.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>Pre-pay Metering</p> <ul style="list-style-type: none"> • PPL Electric will conduct a pilot in 2013 that will be offered to 500 residential customers. The program will be non-discriminatory and promoted as an energy conservation initiative similar to programs at Salt River Project and Brunswick EMC. These companies have demonstrated that customers become much more aware of their electric consumption if they experienced the actual purchase in near real time. Through the planning and pilot implementation the Company will also assure that public policy issues dealing with Commission regulations are addressed.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$240,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Establish pilot objectives • Invite 500 customer to participate in pilot • Purchase and installation of meter hardware with an integrated disconnect and in-home display • Develop/implement required software and IT programming changes • Evaluate pilot results • Development of recommendations for implementation • Periodically report results and a proposed implementation plan.
High Level Benefits	<ul style="list-style-type: none"> • Contributes to reduction in the customer's energy consumption • Enables customers to effectively learn how to manage their electric energy payments • Enhances customer payment behavior • Reduces the need to dispatch personnel to disconnect and reconnect because the customer possesses the control to disconnect/reconnect themselves safely when payment credits expire/recharged.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful, PPL Electric expects to offer an opt-in program to all customers with an expected enrollment of 10,000 customers in 2014. The cost to implement this program is estimated at \$3,162,000.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>Momentary Outage Monitoring</p> <ul style="list-style-type: none"> • PPL Electric plans to conduct a pilot in 2011 to further refine the use of momentary interruption (blink count) information to determine how blink information can be provided proactively. This would be accomplished through the aggregation of blink count data in a meaningful way to aid in determining the approximate date, time, and location of the device that operated.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$240,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Develop and enhance business processes that actively review customer blink information • Determine the most likely time and location of a momentary operation • Ascertain how the customer blink information can be incorporated into PPL Electric's outage management system to refine PPL Electric's outage detection analysis and post outage restoration • Assure that automation of the processes is implemented for ease of application of the information for all business users. • Develop/implement required software and IT programming changes • Evaluate the results • Development of recommendations for potential implementation • Report results and implementation plan to the Commission
High Level Benefits	<ul style="list-style-type: none"> • Enables proactive messaging to Company engineers when the blink counts reach a specific threshold limit • Alerts the engineer that an issue may be occurring at the customer location or the feeder servicing that customer or group of customers • Enables engineers to take action to begin their investigation and contact the customer(s) to query if they are experiencing any issues as well as informing them that PPL is working on it • Identifies and resolves device issues which have frequent momentary operations • Improves customer satisfaction of customers who experienced significant numbers of momentary interruptions.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful, implementation of proactive momentary outage capture will result in an estimated cost of \$100,000 in the 2012 to 2013 period.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(6)

Ability to monitor voltage at each meters and report data in a manner that allows an EDC to react to the information

Pilot/Evaluation	<ul style="list-style-type: none"> • In 2010, PPL Electric will implement an enhancement that applies more precise voltage, current and relational phase angle information from the Company's large power meters for diagnosing meter and service issues. • The pilot will be conducted in 2011 to further the measurement, collection and analysis of voltage information to enhance PPL Electric's distribution system reliability using the power line AMI system. In 2010, the company will begin preparing for the pilot by evaluating their voltage requirements and needs.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • Large power meter information enhancement - \$100,000 • PLC based pilot - \$100,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Determine the feasibility of gathering this new information by performing an impact analysis on the AMI to ensure there are no performance issues • Export the data collected into a meter data management system to provides a facility for engineers to access and apply the data in business applications • Develop/implement required software and IT programming changes • Establish implementation plan • Reporting results and implementation plans to the Commission.
High Level Benefits	<ul style="list-style-type: none"> • Application of voltage profiling information at a customer, transformer and circuit level will provide information on the health of an entire circuit • Use of this information will alert PPL to customer voltage problems, thereby increasing customer satisfaction by correcting voltage issues on a proactive basis • Measurement, collection and analysis of voltage information will enable improved voltage control • Applications of voltage, current and relational phase angles information will proactively aid identification of defective metering equipment to avoid revenue loss • Will provide pertinent information to a smart grid strategy that will enable PPL Electric to reduce voltage when needed to maintain distribution system reliability • Will provide a framework for an accurate operational model, which will provide faster customer restoration, and more efficient system utilization.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

Potential Implementation	<ul style="list-style-type: none">• If the PLC based pilot is successful, it is expected that implementation will occur in 2012 at an estimated cost of \$125,000.
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PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(7)

Ability to remotely reprogram the meter

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric will be evaluating ways to continue refining the power line smart meter infrastructure's remote programming capabilities. These evaluations are associated with the work described in Section 6C(5).
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• The costs to complete these evaluations are included in Section 6C(5).
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Demonstrate enhanced ability to reprogram meters• Upgrade the system's equipment firmware to improve performance• Consider potential equipment hardware upgrades to accommodate enhanced functionality.• Reporting results and implementation plans to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Benefits are similar to that described in Section 6C(5).
Potential Implementation	<ul style="list-style-type: none">• Embedded in that described in Section 6C(5).

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(8)

Ability to communicate outages and restorations

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric will define roadmaps and conduct a pilot to further enhance use of the existing AMI's capabilities in 2010.• The objective of the pilot will be to determine the system-wide feasibility of using the power line system for proactive meter outage detection for the purpose of distribution system health checks and active outage detection.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$100,000
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Establish pilot objectives• Demonstrate improvement in the accuracy of existing pings through the investigation and mediation of performance issues• Optimize ping services to more actively assess outage conditions and dispatch personnel where required• Reporting results and implementation plan to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Implements proactive pinging of customers' meters to determine their outage status will help reduce outage times for customers, specifically for smaller outages, or outages where a customer would not normally report that they are out of service• Ability to know outage types and locations will more quickly allow PPL Electric to report that information to customers who do call in• Will provide a framework for more quickly performing proactive outage notification feature in the future for customers to elect that option.
Potential Implementation	<ul style="list-style-type: none">• If the pilot is successful, it is expected that implementation will occur in 2011 at an estimated cost of \$\$170,000. This cost has increased due to higher than expected vendor costs.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(9)

Ability to support net metering of customer generators

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric will pilot, in 2010, the functionality and performance of the new bidirectional meters in our infrastructure that measure energy flow at the PPL Electric point of contact. The pilot will consist of using 400 bidirectional meters in the power line smart meter system that will provide net energy usage on an interval basis measuring delivered and received energy flowing to the PPL Electric grid. The pilot customers will be existing net metering customers with older vintage meters. In addition, there will be changes required to PPL Electric's MDMS and billing system to accept delivered and received energy usage.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$238,600
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Identify approximately 400 existing net metering customers and replace their meter to the new standard power line meter.• Meter hardware and installation• Develop/implement required software and IT programming changes for the AMI, MDMS and the Company's billing system• Evaluate pilot results• Establish an implementation plan• Report results and implementation plan to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Supports the functional operation and performance capabilities of the power line smart meter infrastructure and bi-directional meters• Meets the intent of the Commission's Net Metering tariffs• Provides a feasible and economical meter solution to monitor AEPS renewable energy requirements through measurement of the generation output of applicable generation sources.
Potential Implementation	<ul style="list-style-type: none">• Implementation will be required to fully support net metering for customers with generation installed. Implementation costs are estimated at \$285,000 in 2011. This will not include installing new meters. Implementation will include required software changes to the Company's AMI, MDMS and billing systems.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

**6B(1)
Bidirectional Data Communications**

Pilot/Evaluation	<ul style="list-style-type: none">• Perform evaluations using in-home displays with home area networks in coordination with the pilot referenced in section 6C(4)
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• Estimated cost of this evaluation is embedded in costs outlined in Section 6C(4)
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Establish pilot objectives,• Provide price and consumption information to the customer to aid in making energy efficient buying decisions• Demonstrate control of customer end use devices,• Evaluate bidirectional communications to these devices• Invite 500 customers to participate in the pilot• Provide the meter and home control/display hardware including any equipment installation• Develop/implement required software and IT programming changes• Evaluate pilot results and establish a potential implementation plan• Report results to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Contributes to the reduction of energy consumption through "conservation smart" automated home controls• Provides the basic hardware foundation for special rate initiatives such as critical peak pricing• Enables customers to understand and control of consumption

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6B(2)

Recording hourly usage data on at least an hourly basis

Pilot/Evaluation	<ul style="list-style-type: none">• None to be performed because we meet this requirement with the existing power line and large power smart meter systems.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• Not applicable.
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Continue to deploy meters for new construction, upon customer request, and to replace damaged and defective meters.
High Level Benefits	<ul style="list-style-type: none">•

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6B(3)

Provide customers with direct access to and use of price and consumption information

Pilot/Evaluation	<ul style="list-style-type: none"> • Perform evaluations using in-home displays with home area networks in coordination with the pilot referenced in section 6C(4). • Another initiative is intended to evaluate and pilot various communication mediums. PPL Electric already provides electronic access to price and consumption information today via their website and through EDI transactions. However, the Company would like to experiment with enhancements that include alerts on price and/or consumption, as well as rate comparisons. These proposed pilot evaluations would include tests of communication channels such as near real-time email and text messages to customers.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • <u>\$143,000</u> to evaluate and pilot various communications mediums
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Evaluation of available technologies in 2010 • <u>Pilot in 2011</u> of the following: <ul style="list-style-type: none"> ○ Messaging to multiple communication channels ○ <u>Deploy rate comparison tool</u> to provide customers with ability to compare rate options ○ Deployment of software and required licensing from chosen vendor
High Level Benefits	<ul style="list-style-type: none"> • Customers will derive increased understanding and awareness of energy usage, which lead to better energy management.

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PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6B(4)

Provide customers with information on their hourly consumption

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric provides its customers with information on hourly consumption from its AMI. This data is provided on a daily basis to the PPL Electric meter data management system that enables customers to access their individual information on the web.• The Company understands that this information may not be in a format that is easily usable for certain customer applications. Thus, during the 30 month period, the Company plans to work with customers, EGSs and third parties to provide hourly consumption that is in clear and understandable formats.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• The high level costs have not been quantified presently and will be provided through the periodic reviews with the Commission during the 30 month grace period.
Pilot/Evaluation Plan	<ul style="list-style-type: none">• To be determined and reported back to the Commission staff within the 30 month grace period
High Level Benefits	<ul style="list-style-type: none">• To be determined and reported back to the Commission staff within the 30 month grace period

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

**6 B(5)
Enabling TOU and RTP Programs**

Pilot/Evaluation	<ul style="list-style-type: none"> In 2010, conduct a performance evaluation with the Company's AML to determine the feasibility of collecting and delivering 15-minute data at a high success rate for RTP billing for large power customers greater than 500 KW in demand. This evaluation will be conducted in coordination with Evaluation #1 discussed in Section 6C(2). <u>Due to billing system limitations for real-time pricing, PPL Electric determined that it was most cost effective to read the accounts with greater than 500 kW demand with the large power meter wireless system. This amounted to 320 accounts and was completed in 2010 outside of the Plan.</u> We expect modest investments may be incurred over the 30 month period to potentially enhance TOU and hourly data delivery through pilot installations of meters with additional storage. This will allow the company to evaluate the collection and capture of historical data for billing and presentation purposes. This evaluation will be conducted in 2012 in coordination with <u>the pilot</u> referenced in Section 6C(3).
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> Estimated cost of the historical data collection evaluation is embedded in <u>the</u> costs outlined in Section 6C(3)
Pilot/Evaluation Plan	<ul style="list-style-type: none"> Plans are as discussed in Sections 6C(2) and 6C(3)
High Level Benefits	<ul style="list-style-type: none"> As outlined in Sections 6C(2) and 6C(3).

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PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6 B(6)

Supporting the automatic control of the customer's electric consumption

Pilot/Evaluation	<ul style="list-style-type: none"> PPL Electric will be conducting a pilot to further extend the benefits of the currently deployed AMI to demonstrate how it meets this minimum requirement. This will be accomplished by installing load control devices, air conditioning <u>systems and</u> water heaters. The pilot is expected to be started in 2010 and completed in 2011. 	<p>Deleted: on various customer equipment that include heating, ventilation and</p> <p>Deleted: systems,</p> <p>Deleted: and other appliances in the premise</p>
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> <u>\$507,200</u> 	<p>Deleted: \$436,000</p> <p>Formatted: Not Highlight</p>
Pilot/Evaluation Plan	<ul style="list-style-type: none"> Establish pilot objectives Invite 500 customers to participate in the pilot Purchase and install load control devices <i>Develop/implement required software and IT programming changes and licensing</i> Evaluate pilot results Establish potential implementation plan Report results and proposed implementation plan to the Commission 	
High Level Benefits	<ul style="list-style-type: none"> Allows customer to take advantage of TOU rate options Enables customers to shed load during periods of peak pricing Provides capability for PPL Electric to shed load during emergency load reduction events called by PJM to maintain system reliability <u>Can supplement PPL Electric peak reduction requirements mandated by the Act 129 EE&C Plan.</u> 	<p>Formatted: Not Highlight</p>
Potential Implementation	<ul style="list-style-type: none"> If the pilot is successful, then a potential deployment with an anticipated 5,000 customer enrollment annually may result in total estimated implementation cost of <u>\$7,772,500</u> from 2011-2014. 	<p>Deleted: \$4,200,000</p>

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(1)

Ability to remotely disconnect and reconnect

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric will conduct a remote disconnection/reconnection pilot in 2011 to connect and disconnect premises where frequent move in/move outs occur in its service territory. The pilot would enable "hard" blocking of all accounts in the pilot, excluding terminations for non-payment.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$210,000
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Establish pilot objectives• Invite 500 customers to participate in the pilot• Purchase of meter hardware and installation• Develop/implement required software and IT programming changes and licensing• Evaluate pilot results• Establish potential implementation plan• Report results and proposed implementation plan to the Commission
High Level Benefits	<ul style="list-style-type: none">• Contributes to the reduction in consumption on inactive meters• Eliminates need to dispatch personnel to disconnect and reconnect• Provides ability to comply with Commission regulations in normal connect/disconnect situations• Provides ability to enable cold load pickup resulting from emergency load reductions or in large storm restoration effort• Automates the process for completing connects and disconnects• Has the potential to support emergency load reductions as directed by PJM and/or PPL Electric's Systems Operations especially where automatic switching is not available.
Potential Implementation	<ul style="list-style-type: none">• If the pilot is successful, then a potential deployment to an estimated 50000 customer locations from 2012 - 2014 may result in total estimated implementation cost of \$13,225,000.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(2)

Ability to provide 15-minute or shorter interval data

<p>Pilot/Evaluation</p>	<ul style="list-style-type: none"> • <u>A pilot will be conducted in 2010 to consistently provide 15-minute interval data in the power line smart meter infrastructure using installed meters that have the capability to be configured for 15-minute data collection at the small commercial customer level. In addition, a scalability test will be completed to determine if PPL EU's power line system can handle reading 15-minute data from all small commercial accounts without significant investment into the power line system.</u> 	<p>Deleted: Evaluation #1 is to complete a performance evaluation in 2010 to monitor the approximately 800 Rate Schedule GS-3 accounts with greater than 500KW in demand to determine the power line AMI's ability to deliver 15-minute interval data consistently and at a high success rate for real-time pricing.</p> <p>Deleted: Evaluation #2</p> <p>Deleted: 2012</p> <p>Deleted: residential and</p>
<p>Estimated Cost of Pilot/Evaluation</p>	<ul style="list-style-type: none"> • <u>\$134,000</u> 	<p>Deleted: Evaluation #1 - \$65,000 Evaluation #2 - \$35,000</p>
<p>Pilot/Evaluation Plan</p>	<ul style="list-style-type: none"> • <ul style="list-style-type: none"> ○ Remote reconfiguration of installed newer smart meters from 60 minute to 15-minute collection ○ <u>Scalability test</u> ○ Evaluate pilot results ○ Development of recommendations ○ Report results and an implementation plan to the Commission. 	<p>Deleted: <#>Evaluation #1: <#>Remotely reconfiguring the meters from 60 minute to 15-minute interval data collection <#>Evaluate pilot results <#>Development of recommendations <#>Report results and an implementation plan to the Commission. Evaluation #2:</p> <p>Formatted: Bullets and Numbering</p>
<p>High Level Benefits</p>	<ul style="list-style-type: none"> • Demonstrate how PPL Electric tested enhancements will meet the needs of customers, third party aggregators and EGS's for interval data of 15-minutes or less • Allows customers to improve their ability to shop for a generation supplier with more precise load data. 	
<p>Potential Implementation</p>	<ul style="list-style-type: none"> ○ <u>If the scalability test fails, PPL EU will need to determine how to proceed with providing 15-minute interval data to small commercial customers after customer requests for 15-minute data reach a certain threshold.</u> 	<p>Deleted: <#>If Evaluation #1 cannot meet the pilot objectives, then large power meters will be deployed. The estimated cost to complete this deployment is \$990,000, which includes: <#>Meter hardware and installation for a total of \$510,000 <#>Ongoing telecommunication costs of \$120,000 per year.</p> <p>Formatted: Bullets and Numbering</p>

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(3)

On board meter storage of meter data

Pilot/Evaluation	<ul style="list-style-type: none">• A pilot will be conducted beginning in 2011 and concluding in 2012 to test the ability to acquire any or all of those 30 days of data and revalidate it in the meter data management system(MDMS).
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• \$130,000
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Implement software application changes and upgrades to the smart meter infrastructure and the MDMS• Implement changes to business process for validation, editing and estimation of billing and presentation data• Develop/implement required Company software and IT programming changes• Evaluate pilot results• Development of a potential implementation plan• Report results and proposed implementation plan to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Tests the operation and performance of the meters' extended memory capabilities• Demonstrates the ability to support the on-board storage capability• Provides the ability to re-acquire lost data for more accurate billing information and data presentment
Potential Implementation	<ul style="list-style-type: none">• None planned except for deploying normally purchased new meters to meet this requirement going forward in the smart meter plan. This plan will provide smart meters for new construction, customer requests, and replacement of damaged and defective meters.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(4)

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

<p>Pilot/Evaluation</p>	<ul style="list-style-type: none"> Conduct a home area network pilot trial beginning in 2010 and concluding in 2011 to develop the appropriate technology that meets customer requirements and expectations. <u>The pilot will incorporate IEEE 802.11 compliant wireless local area network (WLAN) communications.</u> 	<p>Deleted: incorporating IEEE 802.15.4 compliant Zigbee communications</p>
<p>Estimated Cost of Pilot/Evaluation</p>	<ul style="list-style-type: none"> <u>\$305,500</u> 	<p>Deleted: 410,000</p>
<p>Pilot/Evaluation Plan</p>	<ul style="list-style-type: none"> Establish pilot objectives Provide price and consumption information to the customer to aid in making energy efficient buying decisions <u>Evaluate bidirectional communications to the end use devices</u> Invite 500 customers to participate in the pilot Provide the meter and home display hardware including any equipment installation Develop/implement any required software and IT programming changes Evaluate pilot results Development of a potential implementation plan Report results and proposed implementation plan to the Commission 	<p>Deleted: <#>Enable potential to control customer end use devices</p> <p>Deleted: control/</p>
<p>High Level Benefits</p>	<ul style="list-style-type: none"> Contributes to the reduction of energy consumption through "conservation smart" automated home controls Provides the basic hardware foundation for special rate initiatives such as critical peak pricing Enables the customer to understand and control their energy consumption. 	
<p>Potential Implementation</p>	<ul style="list-style-type: none"> If the pilot is successful, then a potential annual deployment to an anticipated 10,000 customer enrollment from 2012 - 2014 may result in a total estimated implementation cost of <u>\$3,965,000.</u> 	<p>Deleted: \$6,000,000</p>

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>General Obsolescence and Upgrade Issues</p> <ul style="list-style-type: none"> Over the next 5 years, PPL Electric will conduct technological and economic evaluations that can enhance the performance of the existing AMI components as well as on next generation smart meter system technologies and Smart Grid integration over the next five years. These evaluations will consider obsolescence of the communications infrastructure equipment and meters, replacement with new technology that enable PPL Electric to extend the minimum requirements and support the additional capabilities.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> \$350,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> Evaluate the existing power line smart meter infrastructure in 2011 that extend the minimum requirements and support the additional capabilities as well as the PPL proposed enhancements Evaluate Smart Grid Integration over the period from 2011 to 2014 that extend the <i>communication infrastructure's capability</i> to backhaul AMI/Smart Grid data more effectively Consider additional or new smart meter infrastructure equipment to enhance data capture and accommodate new end use devices Continually evaluate the next generation of AMI technologies for applicability at PPL. Periodically report results and potential implementation plans to the Commission.
High Level Benefits	<ul style="list-style-type: none"> Effectively manage obsolescence of existing smart meter infrastructure Positions PPL electric for additional capabilities including <i>Smart Grid related applications and operations</i> Improves efficiency in backhauling advanced meter data, Avoids an investment of \$380 to \$450 million to deploy a new smart meter system and meters resulting in lower cost recovery from customers.
Potential Implementation	<ul style="list-style-type: none"> If the evaluations result in recommendations to implement technologies that improve system performance, the potential cost to deploy is estimated at \$4,560,400.

Deleted: \$9,660,400

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>Service Limiting/Service Extending</p> <ul style="list-style-type: none"> • PPL Electric will conduct a pilot to deploy this enhanced capability at 500 customer accounts from 2013 through 2014. This pilot will enable PPL Electric to evaluate the effectiveness and potential benefits of this capability for payment troubled customers, while addressing the public policy issues dealing with Commission regulations.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$220,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Establish pilot objectives • Deploy at 500 selected customer locations • Purchase and installation of meter hardware with an integrated disconnect and service extending feature • Develop/implement required software and IT programming changes • Evaluate pilot results • Development of recommendations for implementation • Periodically report results and a proposed implementation plan.
High Level Benefits	<ul style="list-style-type: none"> • Maintain service to and reduce revenue loss from customers with an inability to pay their bills • Improves customer payment behavior resulting in lower service termination and revenue loss • Provides basic current (amperage) levels for essential loads to keep customers in service from April 1st to November 30th resulting in a lower revenue loss • Lowers costs by reducing the need to dispatch personnel to disconnect and reconnect because the customer possesses the control to disconnect/reconnect themselves safely when the current threshold is exceeded.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful and approval is provided by the Commission, implementation will occur beyond the 5 year plan.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>Pre-pay Metering</p> <ul style="list-style-type: none"> • PPL Electric will conduct a pilot in 2013 that will be offered to 500 residential customers. The program will be non-discriminatory and promoted as an energy conservation initiative similar to programs at Salt River Project and Brunswick EMC. These companies have demonstrated that customers become much more aware of their electric consumption if they experienced the actual purchase in near real time. Through the planning and pilot implementation the Company will also assure that public policy issues dealing with Commission regulations are addressed.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$240,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Establish pilot objectives • Invite 500 customer to participate in pilot • Purchase and installation of meter hardware with an integrated disconnect and in-home display • Develop/implement required software and IT programming changes • Evaluate pilot results • Development of recommendations for implementation • Periodically report results and a proposed implementation plan.
High Level Benefits	<ul style="list-style-type: none"> • Contributes to reduction in the customer's energy consumption • Enables customers to effectively learn how to manage their electric energy payments • Enhances customer payment behavior • Reduces the need to dispatch personnel to disconnect and reconnect because the customer possesses the control to disconnect/reconnect themselves safely when payment credits expire/recharged.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful, PPL Electric expects to offer an opt-in program to all customers with an expected enrollment of 10,000 customers in 2014. The cost to implement this program is estimated at \$3,162,000.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

Pilot/Evaluation	<p>Momentary Outage Monitoring</p> <ul style="list-style-type: none"> • PPL Electric plans to conduct a pilot in 2011 to further refine the use of momentary interruption (blink count) information to determine how blink information can be provided proactively. This would be accomplished through the aggregation of blink count data in a meaningful way to aid in determining the approximate date, time, and location of the device that operated.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$240,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Develop and enhance business processes that actively review customer blink information • Determine the most likely time and location of a momentary operation • Ascertain how the customer blink information can be incorporated into PPL Electric's outage management system to refine PPL Electric's outage detection analysis and post outage restoration • Assure that automation of the processes is implemented for ease of application of the information for all business users. • Develop/implement required software and IT programming changes • Evaluate the results • Development of recommendations for potential implementation • Report results and implementation plan to the Commission
High Level Benefits	<ul style="list-style-type: none"> • Enables proactive messaging to Company engineers when the blink counts reach a specific threshold limit • Alerts the engineer that an issue may be occurring at the customer location or the feeder servicing that customer or group of customers • Enables engineers to take action to begin their investigation and contact the customer(s) to query if they are experiencing any issues as well as informing them that PPL is working on it • Identifies and resolves device issues which have frequent momentary operations • Improves customer satisfaction of customers who experienced significant numbers of momentary interruptions.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful, implementation of proactive momentary outage capture will result in an estimated cost of \$100,000 in the 2012 to 2013 period.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(5)

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

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Deleted: Pilot/Evaluation

Deleted: Feeder Meters¶
 <#>PPL Electric will be installing feeder meters as part of a pilot program to track real world benefits. This pilot will be conducted in two phases on both of the PPL Electric AMI systems. ¶
 <#>In 2011, a total of 5 feeders with 20 meters on each feeder will be installed and be read using the wireless large power AMI. ¶
 Then, in 2011 a similar pilot will be conducted using the power line carrier based AMI.

Deleted: Estimated Cost of Pilot/Evaluation

Deleted: \$600,000 (\$300,000 for each pilot)

Deleted: Pilot/Evaluation Plan

Deleted: <#>Determine the optimal system to backhaul the data to a central database¶
 <#>Evaluate the application of the data for smart grid based applications¶
 <#>Establish an implementation plan that optimizes operational efficiency and reliability of service to customers.¶
 <#>Purchase and installation of meter hardware¶
 <#>Develop/implement required software and IT programming changes¶
 <#>Evaluate results¶
 <#>Development of recommendations for potential implementation¶
 Report results and proposed implementation plan to the Commission

Deleted: High Level Benefits

Deleted: <#>Significantly reduce the need to install recording voltmeters at customer locations and along a feeder¶
 <#>Results in reduced dispatch of personnel to install and remove the voltmeters¶
 <#>Provides momentary blink count information over a wider circuit area in concert with premise level metering to more accurately pinpoint the electrical distribution hot spots¶
 <#>Provides sensor information for distribution automation and smart grid processes and applications¶
 Enables identification of potent... [1]

Deleted: Potential Implementation

Deleted: If the pilot is successful, deployment of feeder meters on the remaining 1090 feeders will result in an estimated cost of \$43,600,000 over a 4 year period with \$8,000,000 and \$10,000,000 expended in ... [2]

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(6)

Ability to monitor voltage at each meters and report data in a manner that allows an EDC to react to the information

Pilot/Evaluation	<ul style="list-style-type: none"> • In 2010, PPL Electric will implement an enhancement that applies more precise voltage, current and relational phase angle information from the Company's large power meters for diagnosing meter and service issues. • The pilot will be conducted in 2011 to further the measurement, collection and analysis of voltage information to enhance PPL Electric's distribution system reliability using the power line AMI system. <u>In 2010, the company will begin preparing for the pilot by evaluating their voltage requirements and needs.</u>
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • Large power meter information enhancement - \$100,000 • PLC based pilot - \$100,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Determine the feasibility of gathering this new information by performing an impact analysis on the AMI to ensure there are no performance issues • Export the data collected into a meter data management system to provides a facility for engineers to access and apply the data in business applications • Develop/implement required software and IT programming changes • Establish implementation plan • Reporting results and implementation plans to the Commission.
High Level Benefits	<ul style="list-style-type: none"> • Application of voltage profiling information at a customer, transformer and circuit level will provide information on the health of an entire circuit • Use of this information will alert PPL to customer voltage problems, thereby increasing customer satisfaction by correcting voltage issues on a proactive basis • Measurement, collection and analysis of voltage information will enable improved voltage control • Applications of voltage, current and relational phase angles information will proactively aid identification of defective metering equipment to avoid revenue loss • Will provide pertinent information to a smart grid strategy that will enable PPL Electric to reduce voltage when needed to maintain distribution system reliability • Will provide a framework for an accurate operational model, which will provide faster customer restoration, and more efficient system utilization.

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

Potential Implementation	<ul style="list-style-type: none">• If the PLC based pilot is successful, it is expected that implementation will occur in 2012 at an estimated cost of \$125,000.
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PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(7)

Ability to remotely reprogram the meter

Pilot/Evaluation	<ul style="list-style-type: none">• PPL Electric will be evaluating ways to continue refining the power line smart meter infrastructure's remote programming capabilities. These evaluations are associated with the work described in Section 6C(5).
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none">• The costs to complete these evaluations are included in Section 6C(5).
Pilot/Evaluation Plan	<ul style="list-style-type: none">• Demonstrate enhanced ability to reprogram meters• Upgrade the system's equipment firmware to improve performance• Consider potential equipment hardware upgrades to accommodate enhanced functionality.• Reporting results and implementation plans to the Commission.
High Level Benefits	<ul style="list-style-type: none">• Benefits are similar to that described in Section 6C(5).
Potential Implementation	<ul style="list-style-type: none">• Embedded in that described in Section 6C(5).

PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(8)

Ability to communicate outages and restorations

Pilot/Evaluation	<ul style="list-style-type: none"> • PPL Electric will define roadmaps and conduct a pilot to further enhance use of the existing AMI's capabilities in 2010. • The objective of the pilot will be to determine the system-wide <i>feasibility of using the power line system for proactive meter outage detection</i> for the purpose of distribution system health checks and active outage detection.
Estimated Cost of Pilot/Evaluation	<ul style="list-style-type: none"> • \$100,000
Pilot/Evaluation Plan	<ul style="list-style-type: none"> • Establish pilot objectives • Demonstrate improvement in the accuracy of existing pings through the investigation and mediation of performance issues • Optimize ping services to more actively assess outage conditions and dispatch personnel where required • Reporting results and implementation plan to the Commission.
High Level Benefits	<ul style="list-style-type: none"> • Implements proactive pinging of customers' meters to determine their outage status will help reduce outage times for customers, specifically for smaller outages, or outages where a customer would not normally report that they are out of service • Ability to know outage types and locations will more quickly allow PPL Electric to report that information to customers who do call in • Will provide a framework for more quickly performing proactive outage notification feature in the future for customers to elect that option.
Potential Implementation	<ul style="list-style-type: none"> • If the pilot is successful, it is expected that implementation will occur in 2011 at an estimated cost of \$\$170,000. This cost has increased due to higher than expected vendor costs.

Deleted: <#>Modify the Company outage management system to proactively "ping" customers' meters for service health

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PPL Electric Utilities Smart Meter Plan Pilot/Evaluation

6C(9)

Ability to support net metering of customer generators

<p>Pilot/Evaluation</p>	<ul style="list-style-type: none"> • PPL Electric will pilot, in 2010, the functionality and performance of the new bidirectional meters in our infrastructure that measure energy flow at the PPL Electric point of contact. The pilot will consist of using <u>400 bidirectional meters in the power line smart meter system that will provide net energy usage on an interval basis measuring delivered and received energy flowing to the PPL Electric grid. The pilot customers will be existing net metering customers with older vintage meters. In addition, there will be changes required to PPL Electric's MDMS and billing system to accept delivered and received energy usage.</u> 	<p>Deleted: and the output of the customer's generator.</p> <p>Deleted: 100</p> <p>Deleted: two channels of energy profile data measuring both</p> <p>Formatted: Font: 11 pt</p> <p>Formatted: Font: 11 pt</p>
<p>Estimated Cost of Pilot/Evaluation</p>	<ul style="list-style-type: none"> • <u>\$238,600</u> 	<p>Deleted: \$234,000</p>
<p>Pilot/Evaluation Plan</p>	<ul style="list-style-type: none"> • <u>Identify approximately 400 existing net metering customers and replace their meter to the new standard power line meter</u> • Meter hardware and installation • Develop/implement required software and IT programming changes <u>for the AML, MDMS and the Company's billing system</u> • Evaluate pilot results • Establish an implementation plan • Report results and implementation plan to the Commission. 	<p>Deleted: Selection of 100 customer locations in existing and new net metering situations</p>
<p>High Level Benefits</p>	<ul style="list-style-type: none"> • Supports the functional operation and performance capabilities of the power line smart meter infrastructure and bi-directional meters • Meets the intent of the Commission's Net Metering tariffs • Provides a feasible and economical meter solution to monitor AEPS renewable energy requirements through measurement of the generation output of applicable generation sources. 	
<p>Potential Implementation</p>	<ul style="list-style-type: none"> • <u>Implementation will be required to fully support net metering for customers with generation installed. Implementation costs are estimated at \$285,000 in 2011. This will not include installing new meters. Implementation will include required software changes to the Company's AML, MDMS and billing systems.</u> 	<p>Deleted: If the pilot is successful, implementation of an estimated 500 meters annually will result in an estimated cost of \$125,000 per year.</p>

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served upon the following persons, in the manner indicated, in accordance with the requirements of § 1.54 (relating to service by a participant).

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