

Amy E. Hidakis
Counsel

PPL
Two North Ninth Street
Allentown, PA 18101-1179
Tel. 610.774.4254 Fax 610.774.4102
AEHidakis@pplweb.com



E-File

August 30, 2017

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

**Re: Petition of PPL Electric for Approval
of its Smart Meter Technology
Procurement and Installation Plan
Docket No. M-2014-2430781**

Dear Ms. Chiavetta:

Enclosed for filing on behalf of PPL Electric Utilities Corporation ("PPL Electric") is PPL Electric's Annual Smart Meter Progress Report. This Report is being filed pursuant to the Implementation Order issued on June 24, 2009 at Docket No. M-2009-2092655.

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on August 30, 2017, which is the date it was filed electronically using the Commission's E-filing system.

If you have any questions regarding this Report, please call me at (610) 774-4254 or Philip S. Walnock, Project Manager-Advanced Metering for PPL Electric at (610) 774-3228.

Very truly yours,

A handwritten signature in blue ink that reads "Amy E. Hidakis". The signature is fluid and cursive, with a large initial "A".

Amy E. Hidakis

Enclosures

cc: Ms. Lori Burger
Mr. Daniel Searfoorce
Certificate of Service

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).

VIA FIRST CLASS MAIL

Christy M. Appleby, Esquire
Office of Consumer Advocate
555 Walnut Street
Forum Place, 5th Floor
Harrisburg, PA 17101-1923

Elizabeth R. Marx, Esquire
PA Utility Law Project
118 Locust Street
Harrisburg, PA 17101-1414
Counsel for CAUSE-PA

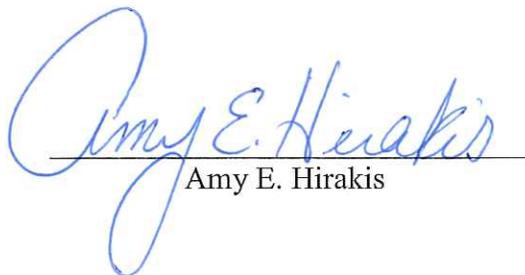
Steven C. Gray, Esquire
Office of Small Business Advocate
Commerce Building
300 North Second Street, Suite 202
Harrisburg, PA 17101

Scott J. Rubin, Esquire
Public Utility Consulting
333 Oak Lane
Bloomsburg, PA 17815
*Counsel for International Brotherhood
Of Electrical Workers, Local 1600*

Pamela C. Polacek, Esquire
Adeolu A. Bakare, Esquire
McNees, Wallace & Nurick
100 Pine Street
PO Box 1166
Harrisburg, PA 17108-1166
Counsel for PPLICA

Robert A. Reiley, Esquire
Department of Environmental Protection
400 Market Street – 9th Floor
Harrisburg, PA 17105
*Counsel for Department of Environmental
Protection*

Date: August 30, 2017



Amy E. Hirakis

**Before the
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**PPL Electric Utilities Corporation
2017 Annual Progress Report
Smart Meter Implementation Plan
(Results to July 31st, 2017)
Docket No. M-2014-2430781**

August 30, 2017

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Introduction

On September 3, 2015, the Pennsylvania Public Utility Commission (“Commission”) approved PPL Electric Utilities Corporation’s (“PPL Electric” or “Company”) Smart Meter Implementation Plan (SMIP) at Docket No. M-2014-2430781. Pursuant to the Implementation Order entered by the Pennsylvania Public Utility Commission (“Commission”) on June 24, 2009, at Docket No. M-2009-2092655, PPL EU submits this smart meter progress report for the initial period ending July 31, 2017 (“Current Reporting Period”).

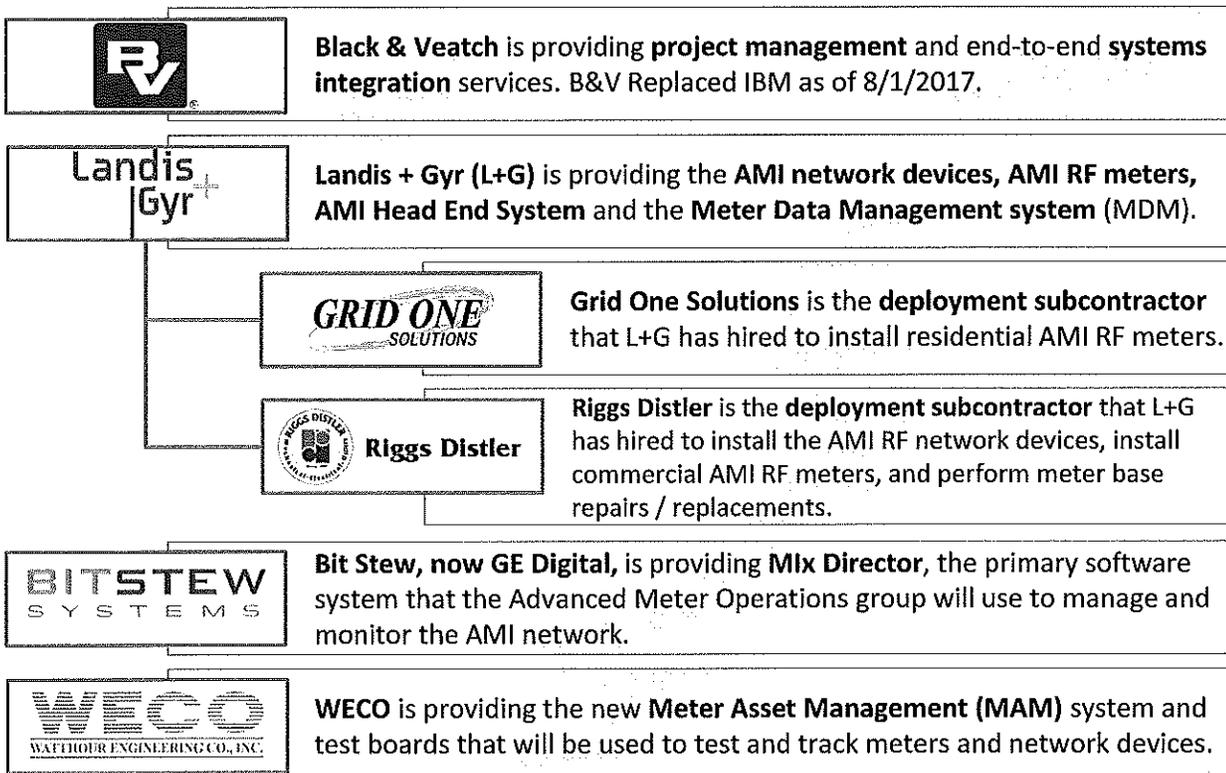
To date, the program is on target with planned functionality schedule, meter installs, and projected cost.

PPL Electric oversees a team of program vendors to assist with planning and implementation of all aspects of the program. Black & Veatch replaced IBM effective 8/1/2017. Black & Veatch’s role on the Project is to provide PPL EU with program management services and system integration services.

The Company’s technology supplier and meter vendor is Landis + Gyr. They are providing the radio frequency network, AMI head end, meter data management system (MDMS), meters and installation services. They are supported by Grid One and Riggs-Distler for network installation, meter installation and meter base repairs.

BitStew Systems (now GE-Digital) is providing Mix Director, the primary software system that the Advanced Meter Operations group will use to manage and monitor the AMI network during deployment and in future operations.

Wathour Engineering Company (WECO) is providing the new meter asset management (MAM) system and test boards that is used to test and track meters and network devices.



Program Scope

PPL Electric's Smart Meter Implementation Plan (SMIP) is designed to meet the Act 129 requirements by first deploying the systems and infrastructure required to enable the new Automated Metering Infrastructure ("AMI") technology. This will be followed by the deployment of radio frequency (RF) meters replacing PPL Electric's existing 1.4 million power line carrier (PLC) meters over a four year period.

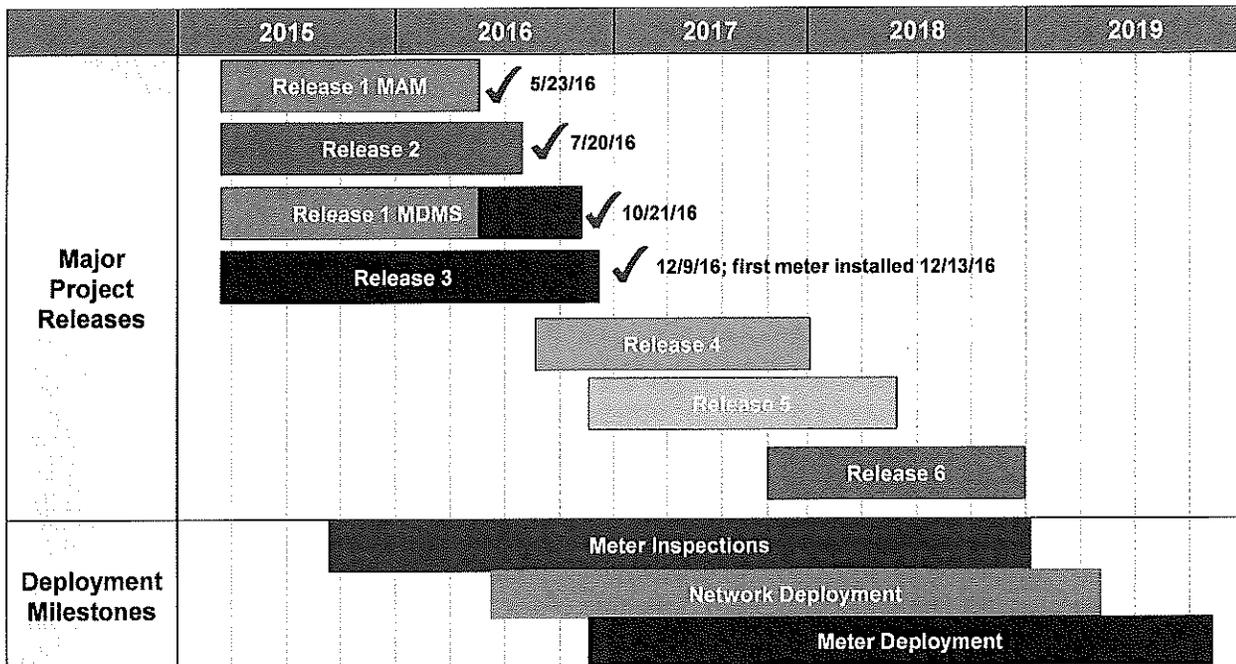
The following items will either be impacted or deployed as part of the program:

- Customer web portal – The portal was updated to display the customers interval usage
- In home devices – Customer owned devices that connects via ZigBee to the meter and displays energy usage information, i.e. home area network
- Electric meters – Use two way communication to collect electricity usage and related information from customers and to deliver information to customers
- Local area network (LAN) collectors and routers – Devices used to relay and collect meter data from all meters in a local area and transmit to the head end through a wide area network
- Wide area network (WAN) fiber and cellular backhaul – Communications infrastructure responsible for transmitting the meter data to the head end
- AMI head end - Systems that receive the stream of meter data from the field making the data available for other systems
- Meter data management system (MDMS) – System that collects and stores meter data from the head end system and processes that data into information that can be used by other applications including network operations, customer information system, analytics and asset management
- Meter asset management tool – Tool used to store the meter and network components information and manages the life cycle of the asset.
- Mix Director – Tool used to track and perform analysis and analytics on meter and network information, along with deployment and operations

Release Schedule

All of the systems and technology mentioned above have been deployed or are being deployed. The information technology release schedule below covers the initial deployment of the systems followed by releases of additional capabilities. Releases 1 through 3, completed in 2016, were foundational to enable functionality for the deployment of radio frequency (RF) meters. Releases 4 through 6 are planned to be completed by end of 2018 as outlined below.

Below is an overview of the releases followed by a description of the capabilities being enabled.



Release 4 – December 2017	Release 5 – May 2018	Release 6 – December 2018
<p><i>Functionality enhancements for Distribution Operations</i></p> <ul style="list-style-type: none"> ▪ Distribution Operations Functionality (OMS/DMS): <ul style="list-style-type: none"> – RF Outage Identification (Last Gasp alerts) – Voltage Sag/Swell – On demand voltage and load reads – Meter Ping from the Customer Call Center – OMS knowledge of meter switch position ▪ Service Delivery Point (“SDP”) to Electric Facilities Database (“EFD”) ▪ Automate daily upload of supplier settlement files to PJM 	<p><i>Support for a subset of enhanced RF functionality and operational efficiencies</i></p> <ul style="list-style-type: none"> ▪ Head End Upgrade ▪ Home Area Network (HAN) ▪ Automation of Work Order Management for the RF Network and Meters ▪ MDMS Estimates ▪ Dashboard Enhancements ▪ Time of Use (TOU) Rate Class ▪ Outage Management enhancements 	<p><i>Support for a subset of enhanced RF functionality and operational efficiencies</i></p> <ul style="list-style-type: none"> ▪ MDMS upgrade to latest version ▪ Net Metering enhancement - IN and OUT channels for customers with generation ▪ System Enhancements for: <ul style="list-style-type: none"> – AMO – MAM – MDMS – Head End ▪ Enable PPL Ownership of Network devices after system acceptance

Deployment

The Company’s approved deployment plan continues to be executed as part of the Commission-approved Smart Meter Plan. The full-scale deployment of RF meters began in December 2016 and continues at this time. The first meter was installed on December 13, 2016 with approximately 650 meters deployed in 2016. The deployment continues to move forward with the goal of achieving full deployment in late 2019.

Meter deployment is broken into three distinct phases:

- Meter inspections, or pre-sweeps, are performed prior to identify issues or barriers to be resolved prior to physical meter deployment. An example is the identification of meter bases that need repair or replacement for a successful meter exchange.

- Network deployment, which is the build-out of the AMI network infrastructure of collectors and routers to transmit data and information from the meter to the AMI head-end system.
- Meter deployment is the physical replacement of our existing power-line-carrier meters to new RF meters.

Meter deployment is planned based on PPL Electric's six major operating regions. Harrisburg region meter replacements started in December 2016; Lancaster region meter replacements started in July 2017; and Lehigh region replacements will start in November 2017. The Northeast region is planned to begin in April 2018 and the Susquehanna region is slated to begin in November 2018.

Meter Inspections

PPL Electric precedes physical meter deployment with a meter inspection phase. This work started in October 2015 and precedes meter installation by about nine to twelve months.

PPL Electric includes this effort since they have not visited most of their meters since 2003-2004 when installing the TWACS AMI system (power line carrier based system). These inspections identify Rules for Electric Meter Service Installation ("REMSI") violations so that customers can remediate them prior to our meter replacement. REMSI are specifically related to standards for meter installations. As stated earlier, PPL Electric is also able to anticipate meter base repairs that will be required in the course of meter deployment.

The Company has completed 555,319 meter inspections in the Harrisburg, Lancaster and Lehigh regions. Harrisburg and Lancaster meter inspections are complete, and Lehigh inspections are approximately 60% complete.

Network Deployment

Deployment of the radio network precedes meter installation by approximately four to six months. This provides cushion against risks in establishing reliable communications to meters that would disrupt mass deployment of smart meters. The network is fully built out in the Harrisburg and Lancaster regions and is currently being completed in the Lehigh region. Lehigh region network deployment is targeted to completed end of August 2017. Work will start in the Northeast region in September 2017. This puts the Company's network deployment approximately one month ahead of the scheduled plan.

The deployment plan has 173 collectors in total to be deployed forming the backbone of the radio frequency network. These collectors are the "take out points" for all network data and they communicate back to the AMI Head End via cellular communications or optical fiber.

The 173 collectors are planned to be supported by approximately 4,600 routers. Routers are radio frequency devices that intercede between meters and other routers to ensure a fully formed radio mesh network allowing for a variety of communication paths from meter to collector. Below is a chart showing the plan and progress for the network deployment.

Sector	Start	End	Complete
West Shore Sector 1	May-16	Jul-16	Jul-16
West Shore Sector 2	Aug-16	Aug-16	Sep-16
Harrisburg Sector 1	Sep-16	Sep-16	Sep-16
Harrisburg Sector 2	Oct-16	Oct-16	Feb-17
Newport-Elizabethville	Nov-16	Feb-17	Feb-17
Lancaster Section 1	Dec-16	Mar-17	Mar-17
Lancaster Section 2	Jan-17	Mar-17	Mar-17
Quarryville	Feb-17	Apr-17	Mar-17
Cocalico	Feb-17	Apr-17	Apr-17
Sinking Spring	Apr-17	May-17	Apr-17
Bethlehem Sector 1	Apr-17	May-17	Apr-17
Lehigh Sector 2	May-17	May-17	Jun-17
Lehigh Sector 1	Jun-17	Jun-17	Jul-17

Sector	Start	End	Complete
Bethlehem Sector 2	Jul-17	Aug-17	
Buxmont	Aug-17	Sep-17	
Pocono	Oct-17	Nov-17	
Honesdale	Nov-17	Jan-18	
Carbondale-Hamlin	Dec-17	Feb-18	
Scranton	Jan-18	Mar-18	
Wilkes-Barre	Mar-18	Apr-18	
Hazleton-White Haven	Apr-18	May-18	
Panther Valley-Orwingsburg	May-18	Jun-18	
Frackville-Marion Heights	Jun-18	Aug-18	
Bloomsburg	Jul-18	Oct-18	
Williamsport	Sep-18	Nov-18	
Lock Haven-Sunbury	Sep-18	Jan-19	

Meter Deployment

As of July 31, 2017, 312,511 meter exchanges have been completed. Of these, 255,786 (96% of meters) have occurred in Harrisburg region. The balance is underway in the Lancaster region which started meter deployments on July 1. Lehigh region meter deployment is expected to start in early November.

The deployment plan targets the installation of 528,000 meters by the end of 2017. The current meter installation pace is approximately 55,000 RF meters installed per month.

Meter Base Repairs

PPL Electric is repairing customer owned meter bases in instances where the meter base conditions may not be conducive to safe meter exchanges. To date, 2,618 major meter base repairs have been completed. Repairs are being done at about 0.9% of the premises where meters are being installed. With a deployment rate of about 55,000 meters per month, the Company expects to see about 500 repairs per month. The plan expected a 1.5% repair rate, which is slightly less than what has been occurring..

Progress on the End-to-End Solution

PPL Electric has delivered strong meter reading performance with its legacy Power Line Carrier (“PLC”) based AMI system. Meter read performance of the new RF based system is also performing at a very high level, exceeding the industry standard read rate of 99.5%.

System	Meter Read Performance (Year To Date)
RF	99.94%

Customer Interaction

Consistent with the approved communication plan, all customers are notified of pending meter replacements in several separate contact attempts. Each customer receives a letter six weeks prior to the meter exchange. This is followed by another letter three weeks prior to the exchange. An automated voice call goes out to all customers the day before their planned meter exchange. On the day of the installation, the installer knocks on the customer’s door prior to attempting the meter exchange. A door hanger is left at the premise at the conclusion of the visit.

PPL Electric has additional resources for customers who desire more information about the program. Online information is available at:

- www.pplelectric.com/newmeters
- Meter inspection information: <https://www.pplelectric.com/at-your-service/investing-in-your-service/new-electric-meters/meter-verification.aspx>

PPL Electric also has a tri-fold new meter brochure that is available through our employees and contractors when a customer requests mailed information.

To date, PPL Electric has experienced 498 customer inquiries regarding the program out of 312,511 installations, or .16% of the installations. Some topics of these inquiries include:

- Work to be performed or completed work
- Appointment scheduling questions
- Statements regarding not wanting a new meter due to health and/or privacy concerns

The program currently has five PUC formal complaints regarding privacy and health concerns. The Company’s policy is to suspend meter exchanges on these accounts while the formal complaint is being reconciled.

Remote Connect / Disconnect (RCRD)

Full remote connect / disconnect (RCRD) functionality went live on April 1, 2017. Below are the performance metric results we have seen from the use of the remote connect / disconnect functionality.

RCRD Performance

		April	May	June	July	PTD	
RF SUMMARY	Cut-Ins	Total Cut-Ins Attempts - RF	249	698	902	808	2657
		Total # of Successful Cut-Ins - RF	248	697	886	788	2619
		% Successful Cut-Ins - RF	100%	100%	98%	97.50%	98.57%
	Cut-Outs	Total Cut-Outs Attempts - RF	366	1100	1091	1151	3708
		Total # of Successful Cut-Outs - RF	360	1095	1076	1117	3648
		% Successful Cut-Outs - RF	98%	100%	99%	97.00%	98.38%
	Move-In	Total Move-In Attempts - RF	84	271	907	993	2255
		Total # of Successful Move-Ins - RF	84	271	901	983	2239
		% Successful Move-Ins - RF	100%	100%	99%	99.00%	99.29%
	Move-Out	Total Move-Out Attempts - RF	151	427	1009	1033	2620
		Total # of Successful Move-Outs - RF	147	425	990	1007	2569
		% Successful Move-Outs - RF	99%	100%	98%	98.90%	98.05%
	TOTAL	TOTAL Transactions - RF	781	2496	3906	3939	11122
		TOTAL Successful Transactions - RF	773	2488	3851	3895	11007
		% Successful Total Transactions - RF	99%	100%	99%	98.90%	98.97%

Financial Analysis / Cost Recovery

The financial analysis below shows actual costs per year and split between capital and operational and maintenance costs. This view shows the actual costs since project inception along with projections for future costs.

Actuals	Capital	Expense	Total
12/31/2015	\$ 24,907,261	\$ 2,529,571	\$ 27,436,832
12/31/2016	\$ 70,874,632	\$ 2,426,328	\$ 73,300,960
7/31/2017	\$ 82,880,640	\$ 3,506,339	\$ 86,386,979
Total Project to date	<u>\$ 178,662,533</u>	<u>\$ 8,462,238</u>	<u>\$ 187,124,771</u>
Projected spend			
8/1/17-12/31/17	\$ 51,850,600	\$ 3,127,357	\$ 54,977,957
12/31/2018	\$ 118,250,321	\$ 6,922,100	\$ 125,172,421
12/31/2019	\$ 72,136,175	\$ 5,342,981	\$ 77,479,156
12/31/2020	\$ 22,032,169	\$ 699,250	\$ 22,731,419
	<u>\$ 264,269,265</u>	<u>\$ 16,091,688</u>	<u>\$ 280,360,953</u>
Total actual + projected	<u>\$ 442,931,798</u>	<u>\$ 24,553,926</u>	<u>\$ 467,485,724</u>

Look Ahead

With meter installations reaching approximately 22% of the Company's customers, PPL Electric has progressed to a steady state portion of the project. PPL Electric anticipates having approximately 1.1 million RF meters installed and releases 4, 5 and 6 completed by the end of 2018. PPL Electric envisions primary RF meter installs to complete August 2019 with clean-up activities ending in December 2019. In summary, PPL Electric is following the approved Smart Meter Implementation Plan without any material modifications. The number of RF meters installed to date, along with the scope, schedule and cost of the program, is in direct alignment with the approved plan.