

# **Smart Grid Advanced Metering Annual Implementation Progress Report**

**Submitted by:  
Commonwealth Edison Company**

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## I. Introduction and Overview

Commonwealth Edison Company (“ComEd”) presents this Annual Implementation Progress Report (“Report” or “AIPR”) of its Smart Grid Advanced Metering Infrastructure (“AMI”) Deployment Plan (“AMI Plan” or “Plan”) to the Illinois Commerce Commission (“Commission” or “ICC”). ComEd’s original proposed AMI Plan was filed on April 23, 2012 in ICC Docket No. 12-0298. The Commission entered an Order approving ComEd’s AMI Plan with certain modifications on June 22, 2012 in ICC Docket No. 12-0298 (“June 2012 Order”). ComEd filed a modified AMI Plan in compliance with the June 2012 Order in ICC Docket No. 12-0298 on July 13, 2012 (“Modified AMI Plan”). On October 3, 2012, ComEd submitted a revised Modified AMI Plan on rehearing in ICC Docket No. 12-0298 (“Revised AMI Plan”). The Revised AMI Plan was approved by the Commission in its Order on Rehearing in ICC Docket No. 12-0298 dated December 5, 2012 (“December 2012 Order”). On April 1, 2013, ComEd submitted the 2013 AIPR, which included certain updates to the Revised AMI Plan. On April 9, 2013, the ICC opened Docket No. 13-0285 to investigate the 2013 AIPR. After the passage of PA 98-0015, the ICC entered an Interim Order on June 5, 2013 approving an accelerated deployment schedule in conformance with the new law. The 2013 AIPR was approved in the final Order entered on June 26, 2013 in ICC Docket No. 13-0285 (“2013 AIPR Order”).

On March 13, 2014, ComEd filed a petition with the Commission seeking approval to accelerate the deployment of AMI meters (throughout this document, the terms “AMI meters” and “smart meters” will be used interchangeably) that was assigned ICC Docket No. 14-0212. The Commission, on its own motion, reopened Docket Nos. 12-0298 and 13-0285 and consolidated those dockets with the acceleration petition as ICC Docket Nos. 14-0212, 13-0285, 12-0298 (Cons.) (“Deployment Acceleration Proceeding”). On April 1, 2014, ComEd submitted the 2014 AIPR, with certain updates to the Revised AMI Plan as well as changes to the updated Revised AMI Plan to reflect the incremental updates to be made if the Commission approved the proposed accelerated meter deployment schedule in the Deployment Acceleration Proceeding. The Commission approved the proposed accelerated deployment schedule in its final Order dated June 11, 2014, in Docket Nos. 14-0212, 13-0285, 12-0298 (cons.), and required certain modifications to the Revised AMI Plan to reflect that ComEd’s consumer education budget will be maintained and that ComEd will devote the same level of resources for education and outreach that it had planned under the acceleration schedule approved in Docket No. 13-0285. On July 2, 2014, in compliance with the Commission’s June 11, 2014 final Order, ComEd filed a Revised AMI Plan (“July 2014 Revised AMI Plan”) reflecting the changes approved and required by the Commission in the Deployment Acceleration Proceeding.

This Report summarizes the activities and achievements accomplished in 2014 and the activities and goals planned for 2015 in the areas of AMI Operational Deployment, Customer Applications, Customer Outreach and Education, and Metrics and Milestones.<sup>1</sup> There are six

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<sup>1</sup> This Report refers to various systems, standards, groups, teams, organizations, and processes described in more detail in the current AMI Plan. While acronyms used in this Report are defined when

numerical attachments to this Report that are referenced in the Metrics and Milestones section. Additionally, there are four appendices to this Report. Appendix A addresses issues and topics beyond those specified for inclusion in this Report by Section 16-108.6(e) of the Public Utilities Act (“PUA”),<sup>2</sup> that the Commission originally directed ComEd to submit with its 2013 AIPR, and that ComEd has voluntarily chosen to update in this AIPR for informational purposes only. Appendix B is the third Biannual Report required by ComEd’s Rider NAM - Non AMI Metering (“Rider NAM”). Appendices C and D contain updates to the July 2014 Revised AMI Plan in legislative “redline” and “clean” forms, respectively, to reflect (i) an upward adjustment to the AMI meter deployment volume planned for 2015 to recognize and incorporate into the AMI Plan the increased meter installation efficiency achieved by the AMI team last year (with a corresponding downward adjustment to installation volumes planned for the 2018 ramp down period) and (ii) a housekeeping update to the description of Milestone and Metric No. 5 to match the information that has been and will be reported for this item per agreement with stakeholders.

### **Operational Deployment**

In 2014, the AMI team completed a number of operational objectives, including: (1) complete the technical architecture and Meter Data Management System (“MDMS”) replacement work; (2) design future-state business processes; (3) continue the planning and execution of field deployment and cross dock operations; (4) complete the implementation of system enhancements and processes to continue the improvement of system operations; (5) continue the use of data analytics tools and processes to improve the effectiveness of revenue protection and the system operations; and (6) continue to refine Rider NAM, approved by the ICC in Docket No. 13-0552 on February 5, 2014 (“Meter Refusal Docket”).

In 2015, the AMI team plans to expand on the successes achieved in 2014. ComEd will increase the deployment of meters from 500,000 (planned) in 2014 to 984,617 in 2015. The IT team will execute three main releases in 2015. The first release includes the enablement of remote connection and disconnection automation, the launch of a web portal to enable property managers to more efficiently manage move-ins and move-outs, and peak-time savings event management, each of which drives the business case benefits of the program. The second release will complete the enhancements required to fully leverage the new MDMS capabilities, which began in 2014, including the ability of the system to process, evaluate, and validate interval data used for customer billing. The third release will focus on the AMI-OMS integration. Some of the expanded functionality includes identification of transformer-level outages and automation of failed restoration notifications to the OMS, both of which will result in continued improvements to storm response restoration and overall system reliability.

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introduced, readers can refer to the current AMI Plan for more detailed information and background on such terms and acronyms.

<sup>2</sup> 220 ILCS 5/16-108.6(e)

The Business Transformation team plans to support the launch of a business process center of excellence within ComEd. The Change Management team will continue to focus on preparing and training impacted employees to properly utilize new tools and processes effectively in the context of their day-to-day jobs. The Change Management team will also continue to proactively communicate critical information and updates to the organization throughout 2015, including key program milestones achieved and the value to the customer and ComEd that result from the AMI program.

### **Customer Applications**

In 2014, the AMI team completed a number of Customer Applications goals, including: (1) the development of technology research on Direct Load Control (“DLC”) devices in preparation for a 2014 DLC pilot; (2) the commencement of design work on the web portal to provide customers with increased access; (3) the renewal of technology research; (4) the continuance of the partnership with Whirlpool; (5) the upgrade and replacement of systems to accommodate the lifting of the 15,000 customer cap under Rider RMUD – Residential Meter Usage Data (“Rider RMUD”) in 2015 and (6) the launch of the SmartGridExchange<sup>SM</sup>.

In 2015, ComEd will continue its efforts to deploy in-progress and planned new products and services, including the Smart Meter Connected Devices (“SMCD”) pilot which allows residential customers to connect and use wireless devices to receive immediate, detailed energy-usage information from their smart meter to help monitor and manage their electric bills. ComEd will further demonstrate the value of the smart grid in unlocking more choice and control for customers with initiatives such as Residential Metered Usage Data (“RMUD”), which enables residential electric suppliers to offer ComEd customers competitive demand response, Time of Use, and dynamic pricing offers. As ComEd delivers on the potential of the smart grid by continuing to launch programs and services under the “SmartGridExchange<sup>SM</sup>” initiative in 2015, ComEd will conduct further technology research in order to survey new opportunities in the market. As the AMI meter rollout continues to progress in 2015, more and more ComEd customers will benefit from the innovative programs, technology and cost savings enabled by the smart grid.

### **Customer Outreach and Education**

In 2014, the AMI team accomplished a number of goals related to the development of Customer Outreach and Education programs, including: (1) the continuing focus on general customer education and an effort to provide information on the use and benefits of AMI meters; (2) the refinement and use of the staged messaging system to provide information to customers related to the smart grid and AMI meters, CARE programs, energy efficiency, and alternative provider options; (3) the development of staged messaging to utilize direct mail and community events; (4) the on-going customization of education programs to fit specific customer segments as identified by demographic data; and (5) the on-going development of financial assistance programs designed to assist low-income customers.

The outreach and education efforts planned for 2015 include: (1) the continued focus on general education to provide customers with information on the use and benefits of smart meters; (2) the

continued use of messages that educate customers about energy-saving tips and energy-efficiency program offerings; (3) the continuation of research to enhance customer outreach efforts and messages; (4) the on-going staged-messaging communications to educate customers throughout the deployment process; (5) the on-going customization of education programs to fit specific customer segments as identified by demographic data; and (6) the enhancement of ongoing financial-assistance programs designed to assist low-income customers.

### **Consultation with Smart Grid Advisory Council (“SGAC”)**

As required by Section 16-108.6(e) of the PUA, 220 ILCS 5/16-108.6(e), ComEd consulted with the SGAC regarding this AIPR. ComEd provided a complete draft of the AIPR to the SGAC in advance of its March 11, 2015 meeting. ComEd also made a presentation on its AIPR at that meeting, and personnel were present that were knowledgeable on each relevant subject. ComEd also provided additional information to the SGAC in response to written questions received after the March 11, 2015 meeting.

### **AMI Plan Revisions**

The edits to implement the updates to the July 2014 Revised AMI Plan as discussed above are contained in Appendices C and D. The update to the planned deployment volumes for 2015 and 2018 is discussed above and explained in greater detail in Chapter 2 of this AIPR. The housekeeping update to the description of Milestone and Metric No. 5 changes the description from “Number of customers enrolled on Net Metering tariff and net load of each customer” to “Number of customers enrolled on Net Metering tariff and the total aggregate capacity of the group.” This change has been reviewed and accepted by stakeholders and is necessary because most Net Metering customers currently have kWh meters that run forward and backwards. Net load can be calculated only for those customers with meters that track in-flow and out-flow. ComEd will be able to track in flow and out flow once a Net Metering customer receives an AMI meter that is turned on.

## **II. AMI Operational Deployment**

### **A. 2014 Activities and Accomplishments**

2014 was a year of significant progress for the ComEd AMI program. As described in the 2013 AIPR, ComEd planned to accelerate the volume of AMI meter deployment to 500,000 meters in 2014 compared to the 160,000 meters in the previously approved plan. This volume increase is in alignment with ComEd’s updated plan to complete the entire deployment of over 4 million AMI meters throughout the ComEd service territory by the end of 2018, which is three years sooner than the originally planned completion of 2021. This meter acceleration plan was approved by the ICC in Docket No. 12-0298 (reopen)/13-0285 (reopen)/14-0212 (consol.) on June 11, 2014. On December 11, 2014, ComEd surpassed the 500,000 meter deployment goal nearly three weeks ahead of schedule and completed 540,744 meter installs through the end of the calendar year safely and efficiently.

Another significant accomplishment this year was the launch of two local facilities in Chicago (Figures 1 and 2) by ComEd's major AMI vendors, General Electric ("GE") and Silver Spring Networks ("SSN"). These facilities support the AMI Program while also providing a boost to the local economy. The opening of each facility, called for pursuant to the terms of the negotiated agreement entered into with each vendor, added numerous full-time, local, high-tech and manufacturing employment opportunities for Illinois residents.



Figure 1 – Illinois General Electric Plant Facility

Additional<sup>3</sup> jobs have also been created locally via ComEd's AMI program, including meter installers, Cross Dock<sup>4</sup> personnel, electricians, supervisors, project managers, IT analysts, and engineers. These new and dynamic employment opportunities have benefited both internal ComEd resources and external contractors. Not a single job loss for a ComEd employee was experienced as a result of the program, and each of the contractors selected by ComEd, including Quantum Crossings, MZI, Intren, and Live Wire, were in alignment with an ongoing commitment to working with minority, women, and veteran-owned business enterprises.



Figure 2 – Opening of Illinois SilverSpring Networks Facility with ComEd CEO Anne Pramaggiore

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<sup>3</sup> Additional information can be found in the Energy Infrastructure Modernization Act Annual Jobs Creation Report

<sup>4</sup> Cross Dock refers to the meter deployment "hubs", termed Cross Docks that are geographically situated throughout the service territory near the planned areas for deployment. Cross Docks serve several functions for the AMI Deployment team, including acting as the receiving point for meters, vehicles, and other materials, as well as the meeting point for meter installers on a daily basis. Each day at the Cross Docks, the meters are loaded onto vehicles for next day's field installation, and the replaced legacy meters are returned at the end of the day prior to recycling.

ComEd also made significant strides in ensuring customer safety. In February 2014, Underwriters Laboratory (“UL”) product certification was achieved for the AMI meters to be deployed within the service territory. This marked a utility industry first and further demonstrated ComEd’s commitment to customer and installer safety.

In further demonstration of this commitment, throughout 2014 the ComEd AMI team proactively completed minor repairs, when prudent, to customer meter bases and associated meter base components to increase the safety of the customer premise. The three most common types of repairs were repairs to sockets and meter housings, repairs to older meter base styles (A-Base), and repairs to observed degraded condition of the electrical wiring within the meter base due to weather and foundation settlement (Frost Loops).

Initial AMI business case benefits were also realized by ComEd and its customers throughout 2014. These benefits included reduction in unaccounted for energy (“UFE”), consumption on inactive meters (“CIM”), and reduced bad debt, all of which represent savings that are socialized to all ComEd customers. A reduction in the number of estimated customer bills<sup>5</sup> was also achieved in 2014 due, in part, to an improved meter read rate resulting from the AMI system.

Additional operational benefits were also realized in 2014, including more efficient utilization of field resources. One of the main categories of improvement was a reduction in truck rolls for manual meter reading throughout the AMI-deployed areas (in the deployment footprint, meters are read wirelessly via the AMI system).

Throughout 2014 ComEd also continued to deliver on a commitment to engage and educate customers on the AMI program and the benefits available to them through smart meters, the supporting technology, and dynamic customer programs that can help them reduce their energy usage to save money. ComEd’s commitment to customer engagement and education was spread across the many diverse communities throughout the service territory. ComEd executed dozens of presentations to city councils and local elected officials (Figure 3), and participated in hundreds of community events and informational sessions throughout the year. ComEd also sponsored the organization of multiple field trips for students, the development of a Youth Ambassador program, launched a Student Innovation contest, and facilitated dozens of smart meter workshops and information sessions with external parties. Additional details regarding ComEd’s Outreach and Education activities are discussed in Chapter IV of this Report.

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<sup>5</sup> Actual performance related to these metrics is included in the multi-year performance metric report to be filed by June 1, 2015 per 220 ILCS5/16-108.5(f-5) (actual filing expected to occur mid-April).



Figure 3 – ComEd Management presenting and addressing questions at a Town Hall Meeting

The following sections provide more specific details and highlights of the progress made by the ComEd AMI Program in 2014. This includes key accomplishments within the Project Management Office (“PMO”), AMI Network and Meter Deployment, Customer Experience, Business Transformation (“BT”), Information Technology (“IT”), and Change Management areas. A summary of actual costs against the planned budget and the associated variance explanation is also included. Results for the established metrics and milestones are also included.

Please note that previous reports also included separate sections for Procurement and AMI Operations, as well as individual sections for Business Transformation and Information Technology. To more appropriately characterize the integrated and cross-functional nature of the AMI Program, Procurement and AMI Operations content has been blended throughout the report, and the BT and IT sections have been combined. These updates were made for both the 2014 summary and 2015 planned activities captured within the report. Future reports will continue in this new format described above and the previous report structure will be retired.

## 1. Project Management Office

Over the course of 2014 the PMO continued to execute the core functions of governance and oversight, program planning, and ongoing management of scope, schedule, budget, issues and risks across all work streams. In the early months of 2014 a focus of the PMO was to drive the re-planning efforts related to the approved meter acceleration plan.

The PMO led the development of requirements and design for improved project performance reporting via a new online dashboard built by the AMI IT team. This dashboard tool enables more timely and comprehensive sharing of deployment progress on a day-to-day basis across the project team and to impacted ComEd executives. The PMO also continued to facilitate the daily teleconference calls (Production Plan of the Day) that review the prior day’s deployment performance against the target, share safety and human performance messages, and discuss the details of completed outreach events, key upcoming project milestones and planned customer and stakeholder outreach events. These daily calls have proven to be an effective management

tool for addressing emergent issues, ensuring collaboration and alignment on the day’s activities, identifying areas for improvement, and celebrating project successes.

PMO has established a centralized contract management function to effectively oversee the field-related contractors that were hired to perform meter installations and electrical repairs to customer-owned metering equipment. This centralized function drove the procurement of contractors, lead the on-boarding of their personnel staff, and provided the daily oversight of their work. The PMO established processes to ensure that all contractors adhere to the same policies and similar procedures as ComEd’s internal workforce, resulting in the safe, quality installation of the smart meters and the meter-related equipment. Contractors participate in the core project administration and reporting requirements just as ComEd’s internal field deployment team does.

In 2014, ComEd had ten contractors perform various field-focused functions within the AMI project:

Contractor Name	Services Provided to ComEd in 2014	Number of Resources on Project in 2014
HBK Engineering	Network design	4
Pennoni Associates	Network design	4
MJ Electric	Network installation	9
PMI Energy Solutions	Network installation	14
Corix Utilities	Meter installation	73
MZI	A-Base style meter housing upgrades and meter installation	27
Quantum Crossings	Electrician repairs to customer meter-related equipment	6
Durkin Electric	Electrician repairs to customer meter-related equipment	7
Intren	Frost Loop repairs (detailed below)	9
Live Wire	Frost Loop repairs (detailed below)	2
Total		155

ComEd Executive Leadership has encouraged each of the program contractors to utilize Construct<sup>6</sup> to help fulfil staffing needs where possible to provide training and job opportunities to diverse candidates in Northern Illinois. In 2014, ComEd’s selected meter installation contractor, Corix Utilities (“Corix”), leveraged Construct when staffing the Glenbard Cross Dock.

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<sup>6</sup> Individuals join Construct from the Chicago Urban League, Besel New Life, YWCA, and the National Latino Education Institute. By being part of Construct, individuals are provided lessons on professionalism, life skills training, and on the job training.

## 2. AMI Network and Meter Deployment

In 2014 ComEd successfully executed the expansion of the AMI network and meter acceleration plan in a safe and efficient manner. As previously described, the realization of benefits associated with AMI meters requires the establishment of a supporting communication network. Therefore, the AMI program requires that the network be built-out prior to the deployment of meters in a given geographic area. Once the AMI network is deployed and operating, installed AMI meters will connect to the network and will certify as operational.

### Network Deployment

There are three main phases in the deployment of an AMI network, including the initial engineering design, work planning, and device installation. The ComEd team completes this work in a sequential fashion throughout the service territory with a combination of internal and external resources.

In 2014, ComEd continued the planning and installation of the AMI network in the Chicago South, Glenbard, Chicago North, and Mount Prospect Operating Areas. ComEd completed the AMI network designs in the Crestwood and Skokie Operating Areas.

ComEd contracted four firms to complete AMI network design and associated device installation activities. Each firm was selected by ComEd based on specific project requirements and an established track record of high performance through a competitively bid process.

The design of the AMI Network begins with SSN completing a radio frequency analysis and selection of the most appropriate Access Point<sup>7</sup> and Relay<sup>8</sup> locations based on the topography and expected radio frequency needs of each area in the ComEd deployment territory.

Starting in 2013 and March 2014, respectively, HBK Engineering, LLC and Pennoni Associates, Inc. were contracted by ComEd to utilize the high level SSN device designs to create more detailed field-level designs for device installation. These field-level designs take into account possible pole locations, pole type, and the amount of existing equipment on each pole, when determining final device locations. Maintenance of power for these devices during storm conditions is a key consideration in the choice of location. In 2014, HBK Engineering and Pennoni Associates performed field surveys and developed engineering designs for a total of 838 (522 and 316 respectively) SSN AMI Access Points and Relays. As planned, designs were completed several months ahead of AMI meter deployment in the Glenbard, Chicago South, Chicago North, Mt. Prospect, Crestwood and Skokie Operating Areas.

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<sup>7</sup> Access Points are field devices that serve as a collection point for smart meter data throughout the ComEd service territory. Each Access Point is designed to communicate with 5,000 smart meters and will transmit meter data to ComEd, via a cellular signal, periodically throughout the day.

<sup>8</sup> Relays are radios that serve to repeat signals and improve signal quality and data transfer in the AMI network.

The volume of Access Points and Relays required in each operating area is dependent upon the total number of meters, and their relative density across the whole operating area (Access Points) and within each neighborhood (Relays). Access Points are designed to communicate with up to 5,000 individual meters, meaning that in areas with dense housing (e.g., Chicago) the number of Access Points will be higher in order to provide coverage for the larger number of meters in that area. Pockets of lower meter densities will drive the requirement for Relays needed to transmit meter data to the nearest Access Point.

Starting in 2013 and April 2014, respectively, M.J. Electric and PMI Energy Solutions, LLC were contracted by ComEd to install SSN AMI network devices. In 2014, M.J. Electric and PMI Energy Solutions installed a total of 684 (144 and 540 respectively) SSN AMI Access Points and Relays. These Access Points and Relays were installed in advance of AMI meter deployment in the Glenbard, Chicago South, Chicago North, and Mount Prospect operating areas. In 2015, ComEd will execute the established strategy to develop network solutions for areas that are traditionally difficult from a radio frequency perspective, including downtown high-rise buildings and rural areas. The process of network design, build, and refinement will begin in the Chicago loop and within the Rockford Operating Area to establish a methodology and set of design and operational learnings to drive strong network connectivity in these areas.

The following table provides a summary of completed and in-progress network design and installation activities through the end of 2014. As noted below, the remaining AMI network coverage required to install AMI meters in the planned locations for 2015 will be completed in early 2015, well ahead of the meter deployment schedule.

<b>Operating Area Name</b>	<b>Network Design</b>	<b>Network Installation</b>	<b># of Access Points (total upon completion)</b>	<b># of Relays (total upon completion)</b>
Maywood	Complete	Complete	21	36
Chicago South	Complete	Complete	72	46
Glenbard	Complete	Complete	51	104
Mt. Prospect	Complete	Complete	43	207
Chicago North	In progress	In progress	169	5
Crestwood	Complete	Not started	107	0
Skokie	Complete	Not started	38	68
Rockford	In Progress	Not started	Design in progress	Design in progress
<b>Total</b>			501	466

Table 1 - Operating Area Network Design and Installation Progress

### **Meter Deployment**

ComEd continued the deployment of AMI meters in operating areas where the network had been installed via multiple Cross Docks. Depending on the size and scale of each Operating Area and the planned deployment levels, each Cross Dock requires approximately 4-8 supervisors, 2-4

planners, 40-60 technicians, and 6-8 Cross Dock workers to be run safely and efficiently. The repeatable modular structure of the Cross Dock allows for efficient expansion of installation capabilities to achieve the daily production levels required under the meter acceleration plan. Three such Cross Docks were opened in 2014, within the Crestwood, Glenbard (Bensenville), and Chicago North Operating Areas. The existing Cross Dock in Maywood was relocated to the ComEd West Tech facility at 3400 Pulaski Road.

This Cross Dock model will continue to be enhanced and leveraged over time to meet the deployment targets under the meter acceleration plan. Additionally, ComEd actively monitors progress and productivity to evaluate the potential need for additional Cross Docks based on business conditions and meter installation progress. If further meter deployment ramp-up or ramp-down is deemed appropriate, based on project experiences and learnings, the Cross Dock model may be leveraged to further accelerate the deployment and increase the annual capacity beyond the current plan.



Figure 4 - Crestwood Cross Dock Ribbon Cutting Ceremony

This expansion of deployment throughout 2014 required an increased labor force for execution. In March 2014, ComEd and Union Local 15 (“Union”) agreed to a landmark labor strategy to complete AMI installations and inventory management at ComEd Cross Docks. This significant agreement between ComEd and the Union allowed for the safe and efficient expansion of the meter deployment footprint via the addition of resources to support the Cross Dock structure. This labor agreement demonstrated a healthy and strong working relationship between ComEd and the Union which will remain a critical component of the success of the program moving forward.



Figure 5 - Chicago North Cross Dock Ribbon Cutting Ceremony

In addition to the expansion of the labor force installing meters in 2014, ComEd also selected a meter installation contractor, Corix, to supplement ComEd labor and meet the quantity of installations required under the meter acceleration plan. Corix will follow ComEd approved processes, procedures, staffing structure, and material tracking protocols to drive consistency in operations. Additional details regarding contractor processes can be found in the PMO section of this chapter as well as in the Employee and Customer Safety section below.

Corix began work in May 2014, and throughout the year installed approximately 196,000 of the 709,761 meters awarded as part of their multi-year contract. Per direction from ComEd, Corix leveraged best practices based on installation experience across the United States and worked collaboratively with ComEd to design and configure the ComEd Cross Dock operational structure. Additionally, Corix worked closely with ComEd to create installation training materials for impacted ComEd employees and contractor staff. Corix is responsible for managing the Glenbard Cross Dock and continues to refine best practices and procedures with ComEd.



Figure 6 - Corix Cross Dock

The following is a summary of the meters deployed throughout the ComEd service territory in 2014. As noted in the table, the deployment targets for all areas were exceeded in 2014, aside from Mount Prospect, which required additional ramp-up for Corix installations:

<b>Operating Areas deployed in 2014</b>	<b>Number of Meters Projected (2014)<sup>9</sup></b>	<b>Actual Number of Meters Installed</b>
Maywood	30,336	37,653
Chicago South	261,464	286,323
Glenbard	172,920	175,314
Mount Prospect	35,280	24,658
Chicago North	0	16,795
Crestwood	0	1
<b>Total</b>	<b>500,000</b>	<b>540,744</b>

Table 2 - Number of Meters Installed per Operating Area

In November 2014, to continue the favorable pace of meter deployment, ComEd opened the Chicago North Cross Dock and began meter installation in that Operating Area ahead of schedule. With additional field resources available, and to maintain the efficiency of already established Cross Docks, ComEd accelerated the opening of Chicago North as it was the next Cross Dock in the deployment plan. In the fourth quarter of 2014, the meter deployment team completed a high volume of installations in a safe and efficient manner. This volume exceeded the previous projections for peak meter deployment levels.

<sup>9</sup> Large Commercial and Industrial (“C&I”) meter installation will begin in 2015.

Including the AMI Pilot, as of December 31, 2014, the total number of AMI meters deployed in the ComEd service territory was 739,483, which is 5.8% more than the target of 699,000 AMI meters installed through December 31, 2014.

### **Unable to Complete (“UTC”) Locations**

A focus of the team throughout 2014 was minimizing the number of unable to complete (“UTC”) meter exchanges. A UTC meter exchange occurs when a meter installer is not able to successfully replace a meter at a customer premise primarily due to lack of access.

Based on AMI Pilot learnings ComEd estimated a life-of-project deployment UTC rate of 1%. However, early deployment experience has found a nearly 3% UTC rate through the end of 2014; this is equivalent to 21,582 unique locations where the meter was attempted to be exchanged, but the work could not be completed. Some typical reasons for UTCs are a locked gate preventing the meter installer from accessing the meter, an obstruction around the meter preventing the exchange, an animal in the customer’s yard preventing the meter installer from entering the customer premise, the meter is located indoors and the customer was not at the premise at the time of attempted exchange, or the customer missed their appointment. The UTCs negatively impact the productivity of the installation team as additional trips to the customer premise are required for completion and at times reflect an unsafe condition for ComEd meter installers.

The growing number of UTCs is a concern for ComEd and the team is making a concerted effort to determine and implement strategies aimed at reducing the number of UTC meters. In an effort to drive down the number of UTCs, the deployment team facilitated cross functional meetings with other field-facing organizations throughout ComEd to identify methods and lessons learned to successfully gain access to premises that have been historically difficult to access. The result of these “UTC Summits” was a series of tactics and process improvements that the team has worked to incorporate into the meter deployment processes and associated training.

For customer premises that have been marked as UTC on multiple occasions, ComEd has found that pairing Saturday calls to customers with same-day meter exchanges has led to a reduction in the overall number of outstanding UTCs. Additionally, ComEd has developed lessons learned and best practices when attempting to access hard to reach meters or customers.

ComEd observed that having trained meter readers from the impacted areas complete the exchange, especially in Chicago, helps to improve the efficiency and UTC rate of meter installations because of those resource’s existing customer relationships and familiarity with the geography. With meter deployment for 2014 operating ahead of schedule, in December 2014 ComEd took the opportunity to allocate more resources towards the resolution of outstanding UTC meters. This focused effort, termed a “UTC Blitz” was completed over a seven day period and resulted in a decrease of 2,511 UTCs. The UTC Blitz also led to the sharing of best practices and tactics that will be applied to ongoing operations to drive down future volume. Pending resource availability and meter deployment progress, the use of future UTC Blitzes will continue to be evaluated.

An additional tactic for reducing UTCs in 2014 was the use of direct mailings. Beginning in May, ComEd began sending a series of four letters to customers at locations where the installation had been attempted multiple times without success. These letters informed the customer that if they did not contact ComEd and either make their meter available for exchange, or set up a specific appointment, they would be entered into the meter refusal process under Rider NAM, making them subject to the associated fees. Through the end of 2014, ComEd experienced a 54% success rate for the reduction of UTCs that were eligible for the direct mailing process.

ComEd will continue to monitor the UTC rate going forward to determine if it increases, decreases, or stays the same; and will use 2019 to complete any remaining UTCs in the service territory.

### **Employee and Customer Safety**

Throughout 2014, ComEd continued to strive to achieve an excellent safety record through ongoing training and thorough safety messaging and reinforcement. The team experienced three Occupational Safety and Health Administration (“OSHA”) recordables in 2014. The incidents included a bee sting, a sprained shoulder from falling into a window well, and a car accident where a parked ComEd vehicle was struck by another vehicle.

ComEd continues to focus on the execution of safe and high quality meter installations for the benefit of customers, ComEd employees, and contractors. Throughout 2014, ComEd has completed a series of safety audits and unscheduled safety blitzes by the management team to ensure that all safety policies and procedures are being followed by employees and contractor staff. In daily calls with the management team, ComEd and contractor staff must discuss any safety and quality issues identified from the previous day’s work, as well as the actual or planned resolution to the identified issues. ComEd staff also shares safety alerts with the team on a regular basis.

To garner an environment of safety, ComEd and contractor field staff conduct daily tailgate sessions to review the meter installation locations being visited that day with a focus on safety of customer and staff as well as the quality of work to be performed. The tailgate sessions also provide an opportunity for field staff to share the past day’s experiences and learnings with their supervisors and other field staff members that could be impacted. This knowledge sharing helps to increase the safety and efficiency of the field staff overall.

In addition to adhering to strict safety standards and procedures, ComEd follows a quality control process for installations to verify successful meter exchanges. This was accomplished by ensuring meter installers receive adequate training, field supervisors completing audits of installation work to ensure all work practices are being followed, and having the management team monitoring the quality of the installations throughout the deployment. ComEd performed audits of 7% of the work performed in 2014 versus a planned target of 5%, further demonstrating a commitment to quality assurance.

## Repairs and Upgrades

ComEd has found that meter-related equipment that has degraded over time requires repair before a new meter can be safely installed. To improve customer and meter installer safety, as well as the overall customer experience, ComEd is proactively completing minor repairs of broken or damaged meter bases, without assessing direct charges to the individual retail customer, as meters are deployed across the service territory.

In 2014, ComEd took on this initiative to increase the safety of the customer premise and the safety of our installers. The customer premise repairs also improve the material condition for ongoing safe operation and advance the quality of the network's future state by avoiding future electrical issues that may have otherwise occurred.

ComEd is taking the opportunity to complete minor repairs to customer premises through the use of licensed electricians. As part of the daily meter deployment effort, meter installers inspect customer meter bases for degraded or hazardous conditions before, during, and after the meter exchange process is complete. When hazardous or degraded conditions are identified, the meter installer will contact a field supervisor who will assess the situation. If the required repair is more complex in nature, the field supervisor will contact a ComEd-contracted licensed electrician to complete the repair. The electricians are available throughout the areas where meters are being deployed to complete repairs as needed.



Figure 7 - Technician Removing Meter Cover Prior to Examining Socket and Exchanging Meter



Figure 8 - Technician Examining the Connection of the Existing Meter and Related Hardware

There are two different types of repairs that are often completed by electricians in the service territory. These include socket repairs and Frost Loop repairs. The following is a description of the types and number of repairs that have been made throughout 2014.

### *Socket repairs*

In 2014, meter installers encountered the following types of degraded socket conditions: broken base, broken block, and damage to the meter housing, among others.

Durkin Electric and Quantum Crossings were contracted by ComEd in August 2013 and June 2014, respectively, to complete repairs to customer meter bases within the deployment areas. In

2014 there were approximately 2,650 repairs completed by Durkin Electric and approximately 3,277 repairs completed by Quantum Crossings in the deployment territory.

The following table provides a count of the main types of repairs to sockets completed by ComEd and their contracted-electricians in 2014.

Type of Repair	Description	# of Repairs Completed
Repair / Refurbish	Modification of meter housing, cleaning of meter base jaws, rebuilding of meter block, modification of fitting cover	1,888
Replacement	Changing of jaws, block, fitting cover, fitting, riser	2,212
Tampering	Bypassing, diversion of power with insertion of jumper wires or objects in fitting, wire connected directly into house, line side tap	241
Other	Other minor repairs to jaws, riser pipe, loose wires, loose jumpers, etc.	1,586
<b>Total</b>		<b>5,927</b>

*Frost Loop repairs*

A “frost loop” refers to the operating condition of a lack of slack in the ComEd-owned entrance wires to the electric service that connects to a meter from an underground service. The lack of slack could cause damage to the meter socket by pulling the meter down or away from its pedestal. Ideally, the service will have sufficient slack to allow for expansion and contraction as the ground freezes and thaws. Over time, frost loops may develop primarily due to weather changes or ground settlement.

Intren was contracted by ComEd in November 2014 to complete Frost Loop repairs. Intren has access to a prioritized list of accounts in need of these repairs, and completed 170 in 2014.

The following table provides a count of the Frost Loop repairs completed by ComEd and their contracted-electrician in 2014.

Type of Repair	Description	# of Repairs Completed
Frost Loops	A frost loop refers to the operating condition of insufficient slack in the entrance wires to the electric service that connects to a meter	170

Aside from repairs to the meter base and related components, in 2014 ComEd began executing a plan to exchange A-Base meters within the service territory through the addition of an adapter. The A-Base meter is an older style of meter and enclosure that connects to the electrical service through the bottom of the meter.

MZI Group was engaged to perform A-Base exchanges along with the installation of the AMI meter. MZI Group was contracted by ComEd in June 2014, and through the end of 2014 completed the installation of 12,834 A-Base meters.

### Meter Deployment and Meter Installer Efficiency Enhancements

Throughout 2014, to aid and enhance the safety, accuracy, and efficiency of the meter deployment effort, the deployment team, IT, and contractors have partnered to improve the tools and processes available to meter installers and project management staff. These enhancements include:

Meter Deployment Efficiency Enhancements	
Key Activity	Detailed Description
Moving from handheld devices to tablets	<p>Moving from handhelds to wireless tablets in 2014 has allowed ComEd to receive real-time updates of order completions from meter installer devices over a cellular network. Those updates previously had to wait until the end of the working day, as the handheld devices' batteries could not last the entire day when connected to a cellular network. The new tablets have replaceable and rechargeable batteries so meter installers can be online throughout the day and data can be shared accurately and in real-time. The tablets also have a larger, brighter, and anti-reflective screen as well as a larger display which makes the tablet easier to use in the field. This larger display allowed multiple screens on a handheld to be combined on the tablet, which increases meter installer efficiency. Lastly, the tablets take clearer and higher definition photos which allow the back-office employees to capture accurate final meter reads, report damage for electrician repair, theft, and meter exchange photos.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Figure 7 - Wireless Handheld</p>



Figure 8 - Wireless Tablet

<p>Upgrading the mobile work order management system and enhancing meter installation workflow</p>	<p>As part of ongoing improvements to the mobile work order management system, ComEd continues to enhance workflow and inventory tracking. A series of straightforward questions, as well as a step by step process, provide a standard workflow for meter installers to safely and efficiently complete a meter exchange. The mobile work order management system also allows for tracking of the ComEd or contractor technician that completed the installation, for future reference and review.</p>
<p>Optimization of field resources</p>	<p>ComEd leveraged unique and opportunistic learnings from the installations completed in 2013 to optimize meter installation resources by planning indoor and outdoor work based on anticipated weather conditions. This included holding-back indoor installation work scheduled in the Fall and pulling up indoor work scheduled to be performed in the Spring, instead completing the indoor work in the traditionally harsh Winter months of January and February. This practice has led to less exposure to extreme weather conditions that negatively impact productivity.</p> <p>Another improvement was realized through the staggering and optimization of shift times within the Cross Dock structure to ease resource congestion while loading and unloading meters at the start and end of meter deployment shifts. Additionally, the standardization of processes related to vehicles, inventory management, and installation procedures drove improvements in efficiency of operations. ComEd also increased the management and rigor of inventory control; in 2014, additional processes were created to allow for the safe and efficient</p>

	<p>deployment of meters.</p> <p>In 2014, ComEd meter installers were provided larger tools bags which allowed them to both carry additional materials as well as to organize and access the materials more efficiently. The addition of larger bags greatly reduced the need for meter installers to return to their truck to retrieve parts, which increased the technician’s efficiency while at the customer premise.</p> <p>ComEd also enhanced meter installer efficiencies by planning meter installation routes based on the location of transformers in the field. This type of planning accounts for the proximity of meters to one another instead of only using street addresses, which can be an inefficient planning technique. This change resulted in time savings for meter installers and work planners by more efficiently grouping meters by physical location.</p>
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Table 3 - 2014 Meter Deployment Efficiency Enhancements

Aside from meter deployment efficiency enhancements in 2014, the AMI Network and Meter Deployment teams worked closely to identify lessons learned between the groups, optimized work processes, and cross-leveraged the people and processes for the high volume of installation activities that took place in 2014. The AMI Network Deployment team participates in regularly scheduled Meter Deployment strategy meetings to ensure alignment exists between the groups. The AMI Network Deployment team will adjust plans accordingly to meet the needs of the meter installation effort. These teams leveraged similar management personnel as well as shared system and process overlaps that enabled both groups to improve planning and execution of work and to collaboratively identify and resolve comparable challenges efficiently.

Throughout 2014, ComEd also continued to focus on the importance and value in establishing a staff with both operating and technical capabilities. Through ongoing training and shared learnings, the resulting modernized workforce that has been established will further enable effective operations and benefit realization through the use of technology. ComEd staff has used automated system events, alarms, and notifications to identify and resolve issues by the AMI Operations team rather than through the use of less efficient field discovery and resolution activities.

Finally, ComEd was able to shorten the meter certification timeline<sup>10</sup> for meters communicating to the network after installation, resulting in benefits for both ComEd and customers. The certification timeline reduction allowed ComEd to be able to use the capabilities of the meter

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<sup>10</sup> The meter certification timeline is the number of days needed to verify the proper operation of a newly installed meter, before ComEd will use wirelessly communicated data to generate bills.

sooner, resulting in a reduction in the number of estimated bills and a reduction in manual meter reads.

### **3. Customer Experience**

#### **Call Center Operations**

In 2014, the Customer Experience team successfully expanded the AMI deployment call center launched in 2013. This group of dedicated customer service representatives focused on customer inquiries related to the deployment of AMI, including the appointment setting process for meter installation. The AMI call center will continue to expand into 2015, being fully staffed by mid-year.

Enhancements in 2014 have focused on improving the overall customer experience of having an AMI meter installed. ComEd adjusted the process of releasing a series of targeted blast calls notifying customers ahead of meter exchanges beginning in their service area. In 2014, the blast calls were made in small, targeted increments throughout the course of the day, as opposed to one or two large outbound calls made in a short period of time. This approach enabled the customer service representatives to more effectively respond to customer inquiries by leveling inbound call volume throughout the work day.

The call center implemented a new Queue Optimizer tool in 2014, which gives customers the option of receiving a call back during periods of extended hold times – reserving their place in line. The calls are automatically routed into the customer service representatives’ call queues during the customers elected call back time frame, limiting the time the customer spends waiting on-hold. This tool helps limit the number of abandoned calls into the call center, and improves the customer experience. After implementing the tool in October, and in combination with the incremental blast calls, the AMI Call Center has seen over a 3% reduction in the monthly abandon rate.

ComEd also completed customer-focused training of call center representatives and management personnel. In addition, members of the Customer Experience team reviewed key customer related topics with meter installers during their morning tailgate sessions prior to beginning installation activities for the day. Execution of this training and associated field focused communications has been found to improve the overall customer experience when interacting with ComEd employees. ComEd continues to improve and update processes based on interactions with customers and has implemented a total quality management program which requires the review of call center representatives’ customer interactions by management employees. These reviews are used to improve customer interaction at the call center and enhance the customer experience.

#### **Customer Experience**

In addition to improvements within the Call Center, on June 19, 2014 ComEd launched a newly designed YouTube channel: <https://www.youtube.com/user/CommonwealthEdison>. The channel houses a number of ComEd videos, including those applicable to AMI. This year, a series of 10 videos was launched on YouTube including ‘The Power of Smart Grid’, ‘The Power of Smart

Meters’, and ‘The Power of Smart Meters (Spanish)’, among others. ComEd uses advertisements on other YouTube channels to encourage customers to view the ComEd YouTube videos and learn more about the AMI program.

The ComEd Customer Experience team partners closely with the ComEd Marketing department responsible for Customer Outreach and Education, further detailed in Chapter IV of this Report. The Customer Experience team provides support to these outreach and education efforts through material creation and development of discussion points to drive customer and employee awareness and understanding of the smart meter deployment and related benefits.

To provide customers with supplemental information about the AMI program and the benefits available to them with the new technology, ComEd organized a series of community outreach events in 2014. The Customer Experience team participated in 35 such events to assist with the ongoing education of customers.

In 2014, the Customer Experience team executed an ongoing communication and education strategy to discuss smart meter refusals with concerned customers. In the event a customer would like to refuse a smart meter, the Customer Experience team works with the customer to understand their concerns and to provide factual information regarding the technology. Through this communication and education-focused strategy, the Customer Experience team has found that more than 30% of the customers whom initially refused a smart meter elected to accept it. The team continued to monitor the customers’ reasoning for refusing the smart meter, including cost, privacy, security, health and safety. This allowed ComEd to become aware and informed of customer concerns, address those concerns with customers, and to improve the overall customer experience. Through the results of these pro-active customer-focused efforts, ComEd has experienced a net refusal rate<sup>11</sup> of 0.15% as a percentage of meters installed from the start of the pilot program through the end of 2014. The figures below provide additional information on the nature of the customer refusals received and the rate of refusal throughout 2014. Additional information on customer refusals can be located in the Rider NAM appendix of this document.

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<sup>11</sup> Net Refusal Rate is reported as a percentage of meters installed. Additional information and statistics regarding Rider NAM can be located in an Appendix to this Report.

**Refusal Statistics:**

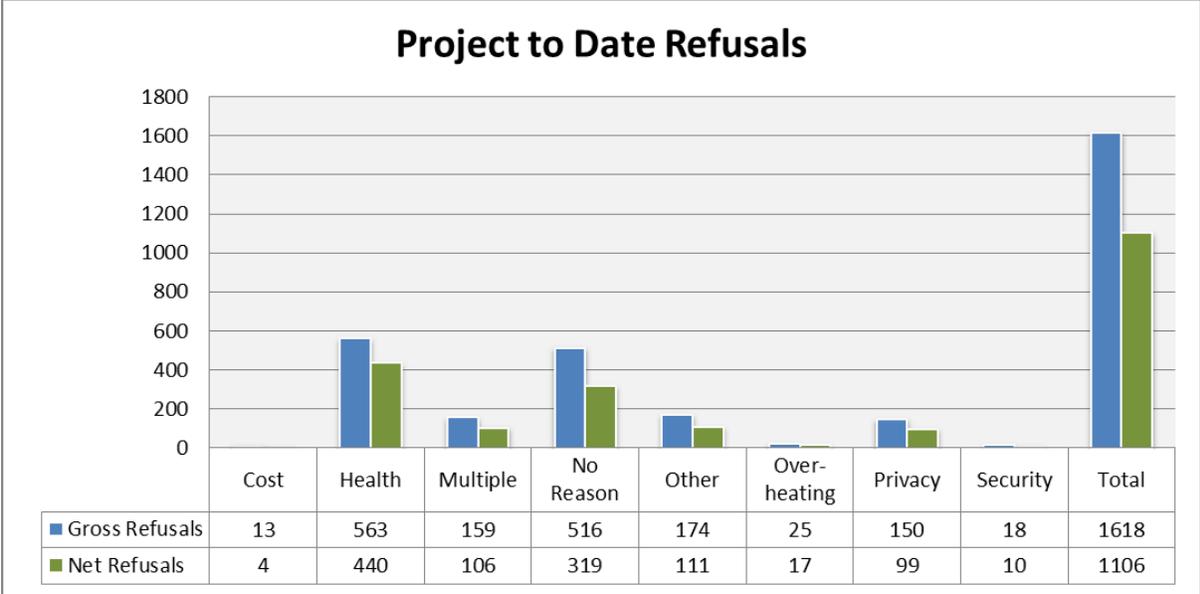


Figure 9 - Project to Date Refusal Types

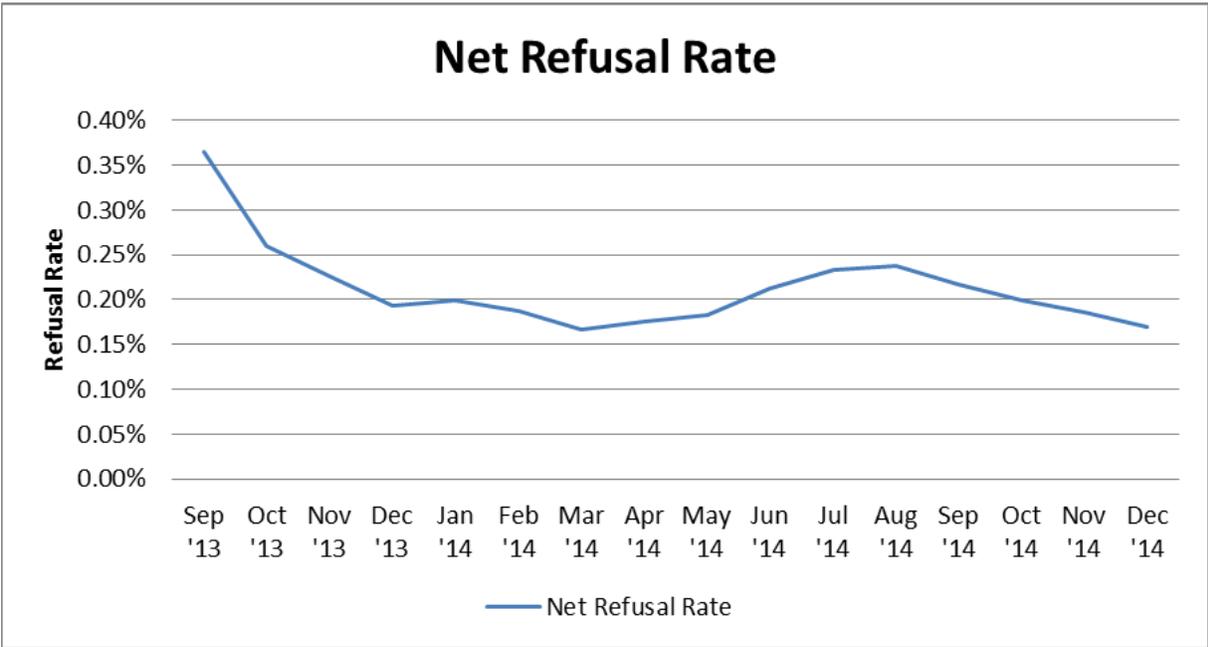


Figure 10 - Net Refusal Rate Over Project Lifetime

The Customer Experience team also refined their business processes in 2014 to align and comply with Rider NAM<sup>12</sup>. ComEd continued to demonstrate flexibility and the importance of driving positive customer interaction by working closely with customers to provide a refusal option that maintains the requirements of Rider NAM and allows customers to refuse a meter under the specified guidelines. A Customer Service Representative or Field Supervisor (when interacting with a customer who refuses the AMI meter in the field) will provide the customer with additional information about the AMI program, the new smart meter, and the costs associated with utilization of a non-standard meter. Depending on the response of the customer, the ComEd representative will either install a new communicating meter or will continue the process to have the customer utilize a non-standard and non-communicating meter, per the customer's instruction<sup>13</sup>.

#### **4. AMI Information Technology and Business Transformation**

During 2014, the AMI IT and BT teams worked jointly to complete a number of activities that are critical to the ongoing success of the AMI program. These activities were structured in alignment with the over-arching system and business functionality delivery strategy, which continued to be refined by the IT and BT teams over the course of the year, focusing on minimizing risk and driving benefit realization in alignment with the established business case. The partnership between BT and IT enabled ComEd to reach and exceed the 500,000 meter deployment goal for 2014.

The functionality delivery strategy for the AMI program breaks down the work required into specific “releases”, or bundles, of system implementations, enhancements, and integrations that align with the desired AMI functionality and business processes that will be utilized by ComEd, as a result of the significant business process design efforts. Each release requires detailed planning, design, testing, deployment go-live delivery, and post-deployment support and validation.

The following figure provides a summary of the functional releases completed for 2014 and planned for 2015.

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<sup>12</sup> Rider NAM is the AMI customer refusal process. Additional information and statistics regarding Rider NAM can be located in an Appendix to this Report.

<sup>13</sup> Additional information can be located in the Rider NAM Appendix to this Report.

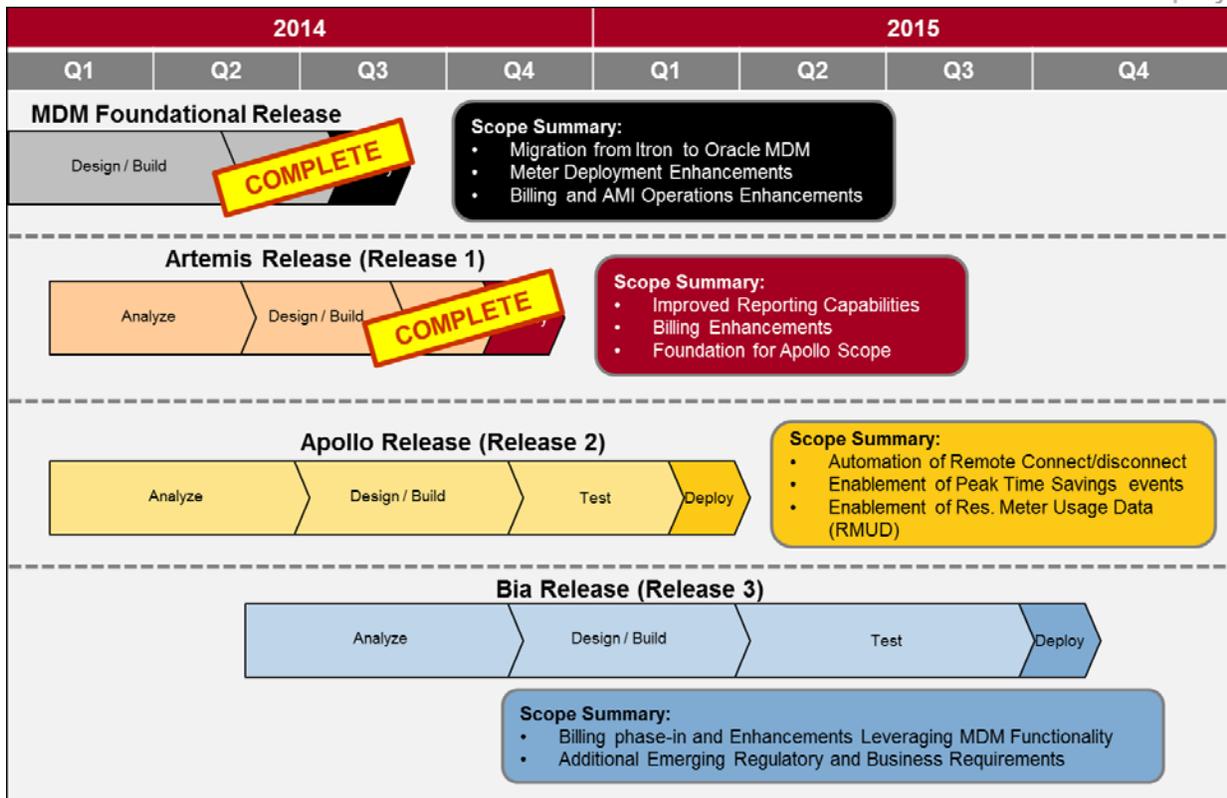


Figure 11 - AMI Functionality Release Schedule

The most impactful activities during 2014 were centered on the migration from the previous Itron MDMS utilized during the AMI Pilot, to a more robust Oracle MDMS, in an effort that began in 2013. These bundled activities, termed the “Foundational Release” (Release 0), enabled the required expansion of meter deployment and data processing capacity and capability for a steady-state AMI operating environment. The MDMS went live between August 15, 2014 and August 17, 2014 and converted 402,000 meters and over 2.4 billion meter reads. The release allowed for the billing of 214,808 registered accounts with a success rate of 99.9%.

The Foundational Release also provided system and process enhancements to the meter deployment, Billing, and AMI Operations teams, and replaced some of the aging AMI pilot system infrastructure. The goal of this release was to lay the foundation for the fully deployed AMI operating environment, and is critical to the future functionality that will drive the desired AMI benefit realization, as outlined in the AMI Business Case.

The delivery of this system conversion required a series of activities that were coordinated by the IT and BT teams, with close interaction and participation from the impacted business areas across ComEd. This included the completion of solution design and development for the delivery of the requirements, business processes, and functionality defined by the BT team during cross-functional working sessions with the impacted business groups. Once design was completed, the IT and BT teams, with support from ComEd users, designed and executed a rigorous test plan to ensure that the solution built met the desired technical and business

requirements, and that these changes would not adversely impact existing ComEd systems and processes.

In parallel to the MDMS conversion, the IT team also launched an online tool to manage the enrollment of ComEd customers in the Peak Time Savings<sup>14</sup> (“PTS”) program. This system enabled customers to sign-up for the program online starting on October 1, 2014, with the first PTS events scheduled to be executed in the summer of 2015. Additional details on the program can be found in Chapter III of this Report.

As the required testing was being completed the IT and BT teams launched a coordinated effort to ensure awareness and understanding of the functionality, tools, and processes to be delivered across the AMI project team and impacted areas throughout ComEd with a specific focus on business readiness. This consisted of a series of cross-functional working sessions where the planned schedule and critical path, including the specific set of identified tasks, were reviewed and approved. Once business readiness affirmation was received from the impacted groups across ComEd, the release go-live effort began, led by the IT team, and the migration to the new MDMS was completed. Subsequent to the completion of implementation, a series of tests and validations were completed to verify successful delivery.

<b>Foundational Release</b>	
<b>Key Activity / Workstream</b>	<b>Resulting Benefits</b>
MDMS Migration	<ul style="list-style-type: none"> <li>Improved operations via a scalable, flexible technology platform that better supports operations, and future business transformation</li> <li>Improved customer experience</li> </ul>
Meter Deployment Enhancements	<ul style="list-style-type: none"> <li>Improved tools and supporting processes driving more efficient field deployment and planning</li> <li>Improved tools and processes for the meter certification process</li> </ul>
Billing Enhancements	<ul style="list-style-type: none"> <li>Improvements to Billing focused on avoiding errors and exceptions that led to Estimated Bills</li> <li>Billing process automation to avoid timely manual work</li> </ul>
Peak Time Savings Enrollment	<ul style="list-style-type: none"> <li>Easy online enrollment for customers to take advantage of the bill savings associated with demand response events managed through the PTS program</li> </ul>

Table 4 - Key Activities for Foundational Release

<sup>14</sup> Additional information regarding the PTS program can be found in Chapter III of this Report.

After the Foundational Release was completed, the IT and BT teams continued with the delivery of a smaller release, in alignment with the established strategy, termed the “Artemis Release” (Release 1). The goal of the Artemis Release was to build upon the Foundational Release by delivering additional billing and meter deployment enhancements, improved reporting capabilities, and to provide additional foundational infrastructure for the future delivery of AMI functionality in subsequent releases planned for 2015. The IT and BT teams, with support from the business, led the successful execution of the plan, design, testing, and launch in Q4, utilizing a similar approach and structure to what was successfully executed for the Foundational Release as described above.

Artemis Release	
Key Activity / Workstream	Resulting Benefits
MDMS Enhancements	<ul style="list-style-type: none"> <li>• Technical enhancements to the MDMS to further enable data processing capabilities in alignment with plans for meter deployment acceleration</li> </ul>
Meter Deployment Enhancements	<ul style="list-style-type: none"> <li>• Improved functionality within the field work management tools to enable more efficient meter deployment</li> </ul>
Billing Enhancements	<ul style="list-style-type: none"> <li>• Enhancements to support the billing of the commercial AMI meters and accounts with unique preference selections</li> <li>• Additional automation and processing to avoid manual processes and estimated bills</li> </ul>
Reporting	<ul style="list-style-type: none"> <li>• Improved reporting capabilities to drive more effective deployment planning, billing exception management, and gathering of key data for internal and external progress reporting and tracking</li> </ul>

Table 5 - Key Activities for Artemis Release

The IT and BT teams also completed strategy, planning, and design for future work scheduled for delivery in 2015 in parallel to the activities described above. These future activities will focus on the delivery of additional AMI functionality and system enhancements to drive the benefits in the overall program business case, including reduction in CIM, UFE, and bad debt expense. These enhancements will draw from the requirements and future state AMI business processes that were identified by the BT team via working sessions with key ComEd process owners.

In addition to the support of the MDMS, the IT team led the development of an improved dashboard reporting tool to allow the PMO to more efficiently and transparently communicate the results of meter deployment on a day-to-day basis. Separate from the PMO, the IT and BT teams worked with the ComEd Regulatory and Customer Operations teams to identify the AMI-

related requirements for enabling customer benefits as well as the development of the third-party energy market. As a result, the IT team delivered increased system capacity and capabilities for third party supplier-billed time-of-use rates via the Rider RMUD<sup>15</sup> program.

Two separate software upgrades to Utility IQ (“UIQ”), the SSN AMI head-end system used for AMI network monitoring and operation, were executed by the IT team, with support from the AMI Operations department. These upgrades were planned refreshes to the software to more current versions offered by SSN. Additionally, the IT team worked with AMI Operations to complete firmware upgrades required to AMI meters throughout the year.

Another accomplishment of the IT and BT teams was the completion of a roadmap and initial launch of efforts for the integration of the AMI systems with ComEd’s Outage Management System (“OMS”). This included the development and rollout of advanced functionality for outage restoration for both the Smart Grid and AMI Programs, via the ongoing partnership with SSN, the selected AMI network vendor, and AMI Operations. The initial effort enables outage management dispatchers to identify locations that are without power, and verify when power is restored, both for storm situations and other outages (such as “blue sky”<sup>16</sup>). These benefits will be expanded upon as the cross-functional team continues to execute the roadmap for a fully optimized and integrated solution to efficiently manage customer outages. The AMI OMS Integration Roadmap is provided in the following figure.

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<sup>15</sup> The Rider RMUD program is further described in Chapter III of this Report.

<sup>16</sup> A “blue sky” outage is an outage which is not caused by a storm or poor weather conditions.

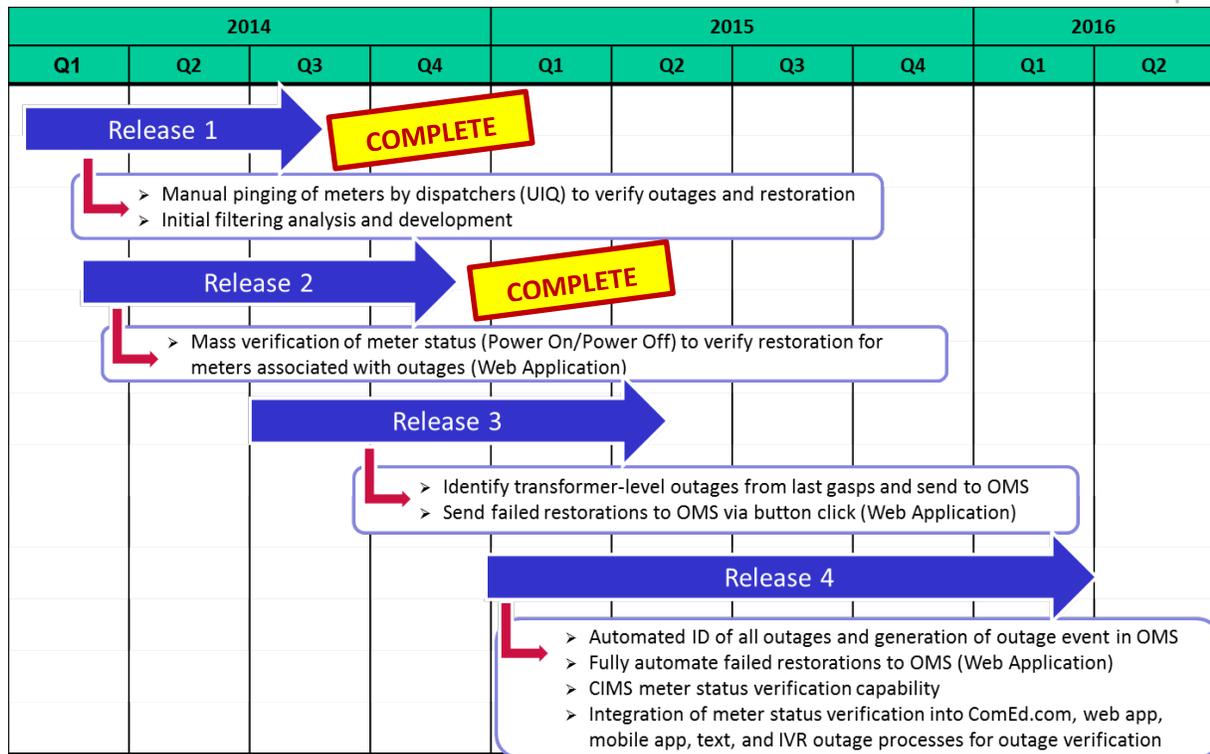


Figure 12 - AMI OMS Integration Roadmap

The IT team also worked closely with the AMI Deployment and AMI Operations teams to support their ongoing needs. This included working with SSN to further bolster and support the performance of the AMI network, and continuing the rollout and enhancement of the Detectent<sup>17</sup> solution for data analytics. ComEd is using Detectent software and algorithms to monitor the health and performance of the AMI network and related equipment, examine meter outage events and last gasp messages, meter alarms, meter voltage levels to ensure safe and regular levels at the customer premise, and to ensure the accuracy of billing data to prevent inaccurate bills to customers, among other analytics metrics.

The deployment team and IT worked collaboratively with Detectent to launch a meter analytics tool in 2014. IT and Detectent worked to configure the tool to enable ComEd to examine the health of the network by monitoring meter alarms, and identifying tampering of meters, allowing ComEd to deploy resources appropriately. An algorithm was created as part of the software release to limit the number of unnecessary truck rolls based on specific criteria for meter events and alarms through the AMI network. The software also helps to analyze meters that are not communicating properly, which contributes to the limitation of the number of estimated customer bills generated.

<sup>17</sup> Detectent is a business intelligence and data analytics company headquartered in California and was recently acquired by SSN (January 7, 2015).

Additionally, the IT team drove several technical efforts throughout the year, focused on ensuring redundancy and security of systems and networks. This included the development of a disaster recovery plan and tests for the continuous operations of the SSN network and supporting systems, as well as deploying continued improvements to system security in accordance with industry standards. An example of such an improvement in 2014 was the enablement of KeySafe, a tamper-resistant Hardware Security Module, which establishes secure communications with meters and other SSN devices within the utility network.

## **5. Change Management and Business Readiness**

Throughout 2014, the Change Management team remained active in development and delivery of internal project communications and training sessions to drive awareness of the AMI program and to prepare the ComEd employees for the changes to their existing business processes. To drive efficient and effective communications to the business, in June 2014 ComEd launched the internal Smart Meter-Enabled Transformation (“SET”) website. The website provides employees with a general understanding of the AMI program, describes how employee day-to-day responsibilities will be impacted by the program, and provides information on upcoming program activities. The SET website received more than 2,000 views from employees in 2014.

To drive mutual understanding across the organization, the team created field alerts and launched events for start of operating areas (what AMI means and what it will enable) and provided executive-level internal communications throughout ComEd. These events were focused on creating awareness for day-to-day impacts to employees as a result of AMI deployment, which were communicated via impactful and engaging Q&A sessions with a wide range of employees. This level of engagement will result in a more informed workforce to operate safely and efficiently within the newly deployed AMI environment. In these sessions, the Change Management team collected 500 surveys and distributed more than 5,000 informational documents (i.e. summary pamphlets and handouts, facts and information about the program, and suggested talking points for interactions with customers). The team also proactively communicated critical information and updates to the organization related to the value of AMI for customers and ComEd, as a result of key IT activities and system functionality delivered in 2014.



Figure 13 - Chicago North Operating Area event to educate employees on the benefits and changes that smart meters bring

The Change Management team held additional internal events and engaged 1,700 employees throughout 2014. The team was responsible for driving communications within the AMI Deployment program execution team, including field and project management personnel. These communications included executive status reports, general communications surrounding the completion of milestones or other program accomplishments, and key communications and updates surrounding the delivery of new AMI functionality and tools. These internal communications have helped to enable an effective cross-functional project team to plan and execute work in a collaborative fashion.



Figure 14 - Event in Mt. Prospect to educate employees about the benefits and changes that Smart Meters bring

Training sessions executed by the team in 2014 were aimed at adequately preparing the business for the impact of the continued execution of the AMI program. Along with effectively rolling out AMI-related communications across ComEd in 2014, the Change Management Team was also responsible for the design and delivery of the ongoing formal training program for the field and project management personnel impacted by the deployment of AMI. This included developing 5 curricula and 29 Instructor Lead Training Classes (ILTs) for the Customer Experience team, Billing, New Business and Customer Care Center business units. In addition to the training program, the Change Management team also developed and delivered 100 field-related communication alerts and developed 123 job aids focusing on specific actions, changes to process, or updates that directly impacted day-to-day operations of the AMI project team or other departments within ComEd. The result of this thorough and cross-cutting approach will be a ComEd workforce that is adequately trained, and continually engaged with the results and progress of the AMI deployment. This will drive safe, effective, and efficient work practices in the field and project management staff.

## **B. 2015 Activities and Goals**

In 2015 ComEd will expand on the successes achieved in 2014. This includes increasing the deployment of meters from 500,000 (planned) in 2014 to 984,617 in 2015 by maintaining the staffing levels in place during the highly productive fourth quarter of 2014. This represents an update and upward adjustment to the 833,000 meters previously planned for 2015 in the July 2014 Revised Deployment Plan.

The IT team will execute two main releases in 2015. The Apollo Release includes the enablement of remote connection and disconnection automation, the launch of a web portal to enable property managers to more efficiently manage move-ins and move-outs, and peak-time savings event management, each of which drives the business case benefits of the program.

The Bia Release will complete the enhancements required to fully leverage the new MDMS capabilities, which began in 2014. This includes the ability of the system to process, evaluate, and validate interval data used for customer billing. Emerging requirements associated with the secure sharing of interval data usage to third-parties as a component of the External Data Exchange initiative will also be delivered via the Bia Release.

Along with the Apollo and Bia Releases, IT will continue to work with a cross-functional team of vendors and ComEd departments to enable additional AMI OMS integration, in alignment with the functionality roadmap created in 2014. These efforts will result in continued improvements to storm response restoration and overall system reliability.

In addition to driving the effective delivery and acceptance of functionality, the Business Transformation team plans to support the launch of a business process center of excellence within ComEd. This group will be responsible for the management and maintenance of business process documentation that is core to day-to-day operations of ComEd. The Change Management team will continue to focus on preparing and training impacted employees to properly utilize new tools and processes effectively in the context of their day-to-day jobs. The Change Management team will also continue to proactively communicate critical information

and updates to the organization throughout 2015, including key program milestones achieved and the value to the customer and ComEd that result from the AMI program.

The following sections provide additional details on the project work that is planned to be completed by the AMI team in 2015.

## **1. Project Management Office**

In 2015, the PMO will be focused on the ongoing management of the program scope, schedule, budget, issues and risks. The PMO will also be responsible for overseeing contractor work and deliverables as well as the 2016 plan for AMI deployment, and will continue to support IT and the business in deploying safer and more efficient tools, processes, and procedures. In 2015 the team will continue the ongoing refinement of the meter deployment dashboard and supporting measurements, to continue to track program progress. The team will also evaluate potential additional uses for the AMI network (e.g., smart streetlights). ComEd will not allow any additional uses or enhancements that compromise the core functionality of the AMI network.

## **2. AMI Network and Meter Deployment**

ComEd's operational success in efficiently and safely deploying AMI meters has resulted in meter installations that have exceeded plan levels for 2013 and 2014. Moreover, the pace of installations reached by the end of 2014 is on track to exceed the previously planned levels in 2015 (833,000 meters). As part of ComEd's ongoing evaluation of the most appropriate ramp-up and ramp-down strategies, ComEd is updating the AMI Plan to adjust the meter deployment schedule to install a total of 984,617 meters in 2015. This includes a corresponding decrease to the planned deployment level in 2018.

This projected increase in deployment is modest and reflects the most accurate information ComEd now has about the rate at which it can safely and cost-effectively deploy meters, rather than any qualitative change in the deployment plan. Increasing the 2015 plan will allow ComEd to maintain the meter deployment and staffing levels achieved in the fourth quarter of 2014 and allows ComEd to retain knowledge gained and lessons learned by staff. The adjustment also provides an improved ramp-down strategy as the reduction of the deployment team can take place over a longer period of time which allows for a more efficient utilization of resources.

These estimates represent an evolving target as new information becomes available and as additional experience is gained. While ComEd is confident that the plan for 2015 is attainable, there are factors which introduce uncertainty. Factors that may affect the outcome of the plan include unfavorable weather conditions, unpredictable customer attitudes, material and labor availability, and premise access for meter installation. These impacts will be monitored and managed closely, with the highest priority remaining on the installation of AMI meters in a safe and quality manner.

The current 2015 Meter Installation Plan, subject to change based on evolving conditions and new information, utilizes a portion of December to address chronic access issues. This plan may continue to evolve, schedules may be accelerated or delayed, and implementation may require fewer or more units at lower or higher cost, even if the scope and timing of the planned work

over the entire project multi-year period does not change. Therefore the ongoing execution of the Plan will remain flexible and not confine progress based adherence to an outdated approach. Moreover, such changes do not imply any flaw in the Plan, or any imprudence or unreasonableness in its execution. To the contrary, planning without flexibility would be unwise and unreasonable.

From a deployment perspective, the AMI network required to support the increased volume of AMI meter installations in 2015 is already in place.

The planned meter and network deployment scope by Operating Area is in the figure below:

<b>Planned Operation Areas in 2015</b>	<b>Number of Meters Projected (2015)</b>	<b>Number of AP's Projected (2015)</b>	<b>Number of Relays Projected (2015)</b>
Maywood <sup>18</sup>	13,448	Complete	Complete
Chicago South	117,454	Complete	Complete
Glenbard	25,275	Complete	Complete
Mount Prospect	192,422	Complete	Complete
Chicago North	356,809	Planning and installation in progress	Planning and installation in progress
Crestwood	155,501	107	0
Skokie	90,200	38	68
Rockford	0	Planning in progress	Planning in progress
Other Areas (periodic meters)	33,508	N/A	N/A
<b>Total</b>	<b>984,617</b>		

ComEd plans to maintain an essentially flat level of deployment volume from the end of 2014 into 2015, and through the end of 2017. This adjustment eliminates field labor inefficiencies associated with ramping-up and ramping-down the deployment volume over those years. The

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<sup>18</sup> ComEd plans to complete meter deployment in Maywood in 2015.

plan also allows ComEd to more gradually and efficiently ramp-down the meter deployment effort in 2018, as the total number of remaining meters for installation in 2018 decreases when compared to the prior estimate. This steadier decline allows ComEd to effectively manage resource attrition and ramp-down the large-scale deployment operations.

Additionally, by increasing the deployment target in 2015, ComEd will be deploying more meters sooner. Meters deployed sooner provide ComEd and customers with opportunities to utilize the functionality sooner, which in turn drives faster benefit realization. As a result of the increased meter deployment target in 2015, installations in the Skokie Operating Area will follow the previously approved Operating Area sequence but will begin in 2015 instead of 2016.

In addition to the deployment of AMI meters in the active deployment footprint, a total of approximately 28,785 AMI meters will be installed in other areas throughout the service territory. For meters subject to the periodic exchange program<sup>19</sup> throughout the service territory, ComEd will begin to install new AMI meters versus purchasing new non-AMI meters. This financially prudent decision eliminates the need to complete multiple meter purchases and meter exchanges in a short period of time. Once the AMI network is built-out in those areas, these meters will automatically connect to the network and, after proper communication and operation is verified, be read wirelessly eliminating the need for a manual read.

In 2015, ComEd will begin deployment of C&I meters in the Maywood, Chicago South, Mount Prospect, Glenbard, and Chicago North Operating Areas. In total, approximately 120,000 C&I meters, as part of the planned installation of 984,617 meters in 2015, will be installed beginning in February. To safely and efficiently install C&I meters, a set of adjusted installation processes for field and project management staff will be executed. The installation processes and people-resources needed to install the C&I meters are slightly different than the people and processes currently used to execute the Residential AMI deployment. To ensure the new people-resources are prepared to execute the C&I processes for installations, a series of training sessions will be held and a detailed set of job aids distributed. These sessions and materials have been developed in coordination with the Change Management and Business Transformation teams. Additionally, the Deployment and Marketing teams will coordinate to execute the customer outreach and education strategy for C&I customers.

ComEd and Corix meter installers will receive training in 2015 to complete A-Base upgrades and related meter exchanges. This training will provide ComEd staff with an opportunity to complete A-Base upgrades and meter exchanges in the future.

As part of the meter deployment, ComEd will continue to execute and refine the established UTC processes and leverage learnings to both limit UTC quantities and optimize their resolution in 2015. To aid the meter deployment activities, ComEd will also continue to complete proactive

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<sup>19</sup> Periodic meters are a specific subset of meters which are changed on a rotation every 8 years by ComEd to verify accurate consumption and data collection. Meters serving larger commercial and industrial customers make up the majority of these meters.

repairs to customer meter bases, to improve the safety of the customer premise and allow for safe installation of smart meters.

ComEd will continue to drive meter deployment efficiencies and improvements through lessons learned in 2014. ComEd will leverage the IT and BT teams to push improvements to tools and processes that drive safe and efficient installations.

As noted within the AMI Plan, the target final completion year for each Operating Area may shift over time based on actual completions and impacts and changes to planning and strategy. While the overall pace of deployment will increase as a result of the proposed deployment schedule adjustment, final completion years for some Operating Areas have shifted slightly into later calendar years based on operating realities such as UTC meters, meter refusals, C&I installation, and the completion of Periodic exchanges.

### 3. Customer Experience

The Customer Experience team will continue to support customer inquiries, schedule meter installation appointments, and handle escalated customer issues in 2015. The team will also continue to implement Rider NAM (i.e., the AMI meter refusal process).

The Customer Experience team will also develop and implement a refusal and outreach strategy that is specific to the C&I installations that begin in 2015. This will include potential changes to the current refusal process and customer communications.

By the end of the second quarter of 2015, the ComEd AMI call center will be fully staffed and will be operating in a steady state environment for the remainder of the deployment effort.

### 4. AMI Information Technology and Business Transformation

The AMI Functionality Release Schedule figure shown previously provides a summary of the functional releases completed for 2014 and planned for 2015. The following is a summary of the major enhancements planned for 2015.

The “Apollo Release” (Release 2) will focus on the delivery of functionality that will drive the business case benefits of AMI. This includes the enablement of remote connection and disconnection automation, the launch of a web portal to enable property managers to more efficiently manage move-ins and move-outs, peak-time savings event management, and support other AMI-enabled programs.

Apollo Release	
Key Activity / Workstream	Resulting Benefits
Remote Connect/Disconnect	<ul style="list-style-type: none"> <li>Automation of the remote switch</li> <li>Reduction of Unaccounted for Energy (UFE), Consumption on Inactive Meters (CIM), and Bad Debt</li> </ul>
Property Manager Portal	<ul style="list-style-type: none"> <li>Easy online enrollment and functionality for property</li> </ul>

	<p>managers to more effectively manage the move-in move-out process with a focus on avoiding unintended service interruption</p> <ul style="list-style-type: none"> <li>• Improved customer experience through replacing a previously manual and time-consuming process</li> <li>• Reduction in CIM</li> </ul>
Peak Time Savings	<ul style="list-style-type: none"> <li>• Enables the execution and ongoing management of Demand Response events within the PTS program that drive customer bill savings and improvement in energy load management</li> </ul>
AMI-enabled Program Support	<ul style="list-style-type: none"> <li>• Enhancements to the processing and capacity for the sharing of interval data with external groups</li> </ul>

Table 6 - Key Activities for Apollo Release

The main focus of the “Bia Release” (Release 3) will be to complete the enhancements required to fully leverage the new MDMS capabilities. This includes the ability of the system to process, evaluate, and validate interval data used for customer billing. Additionally, the Bia Release will support AMI-enabled program development, including the External Data Exchange initiative and the Residential Meter Usage Data (RMUD) program.

<b>Bia Release</b>	
<b>Key Activity / Workstream</b>	<b>Resulting Benefits</b>
Billing Enhancements	<ul style="list-style-type: none"> <li>• Fully leverage the MDMS capabilities to optimize billing process and further minimize estimated bills</li> <li>• Increased capabilities to process, evaluate, validate, and edit interval usage values in an automated fashion</li> <li>• Elimination of costs associated with legacy billing system support</li> </ul>
AMI-enabled Program Support	<ul style="list-style-type: none"> <li>• Improved capacity for processing and sharing of interval data with external groups</li> <li>• Processing and securely sharing interval data with third-parties through the External Data Exchange initiative</li> <li>• Ongoing development and expansion of the RMUD program</li> </ul>

Table 7 - Key Activities for Bia Release

In preparation for and after the delivery of this new functionality, the business transformation team will continue to work with the AMI project team and other impacted users across ComEd to ensure awareness and understanding of the functionality, tools, and processes delivered.

As part of the overall business transformation effort, the team will continue to support the testing and acceptance of tools and functionality tied to the AMI functionality delivery. The team will also continue to work closely with the AMI IT team in the identification of business and technical requirements that will be incorporated into future system and process design. In preparation for and after the completion of software releases, the business transformation team will continue to work with the AMI project team and other impacted users across ComEd to ensure awareness and understanding of the functionality, tools, and processes delivered.

Along with driving the effective delivery and acceptance of functionality, the BT team plans to support the launch of a business process center of excellence within ComEd. This group will be responsible for the management and maintenance of business process documentation that is core to day-to-day operations of ComEd. They will also be responsible for establishing business process standards and guidelines to ensure that future process design efforts are completed in a consistent and repeatable fashion. As AMI deployment continues throughout the service territory, the business process documents that were generated via workshops facilitated by the BT team will be of an increased importance and relevance to the organization, and will serve as examples for how such work efforts should be completed in the future.

In 2015 the IT team also plans to release additional functionality through enhanced integration between the AMI and OMS systems. This functionality will drive enhanced outage detection by capturing and diagnosing last-gasp<sup>20</sup> meter events, identifying likely transformer outages within the outage management system, and the delivery of nested outage management. This improved functionality will drive faster and more efficient ComEd responses to storms and power outages, and improve overall system reliability.

## **5. Change Management and Business Readiness**

In 2015, the Change Management and Business Readiness team will continue to support the AMI program through the changes that result from shifting to an AMI operating environment. The team will focus on preparing and training impacted employees to properly utilize new tools and processes effectively in the context of their day-to-day jobs. The Change Management team will also continue to proactively communicate critical information and updates to the organization throughout 2015, including key program milestones achieved and the value to the customer and ComEd that result from the AMI program. Additional outreach to ComEd employees will also continue, along with the creation of job aids and field alerts, and executive-level communication throughout the organization.

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<sup>20</sup> A last-gasp message is the final message sent from an AMI meter in a power outage event before power loss. The message sent from the meter is passed through the AMI network and provides ComEd with notification that the customer is out of power.

### C. Budget

The following tables compare the updated AMI Plan (2015 AIPR Budget), including an increase in projected 2015 deployment volume, with the previously approved AMI Plan.<sup>21</sup> The tables contain budget values and the associated variances for Capital (“Capital”) and Operation and Maintenance (“O&M”) projections by year and in total. The projected increase in deployment volume to 984,617 meters in 2015 requires a shift in the Capital and O&M spend profile. The adjustments in meter deployment volumes for 2015 and 2018 are a contributing factor to the shifting of projected Capital spend from one year to another, but do not contribute to the increase in total capital spend described below. Other increases in 2015 Capital spend to support the program (aside from the meter deployment spend shift) are balanced with spend reductions in future years and do not impact the total capital spend of the program.

The increase in Capital costs for the lifetime of the project is related to two items:

1. Reallocation of budgeted IT costs for the PTS program to the overall IT costs reflected in the operational budget set forth below.<sup>22</sup>
2. Inclusion of meter purchases to support the growth of new customers on the ComEd system following the completion of the AMI program. Capital spend associated with the purchase of these meters in 2019, 2020, and 2021<sup>23</sup> was not included in the prior AMI Plan and AIPRs, but rather was included in the Company’s long range plan. These costs are now included to more accurately reflect AMI meter purchases throughout the 10-year statutory investment period under EIMA. The updated value for new business AMI meter spend in 2019 is in addition to spend associated with completing the outstanding installations of AMI meters associated with UTC and Rider NAM locations.

The increase in O&M for the lifetime of the program is driven by the costs associated with a higher volume of planned minor repairs to ensure the safety of customers and the safe, quality installations of the meters. These minor repairs will be completed throughout the deployment period.

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<sup>21</sup> See July 2014 Revised AMI Plan filed in in Docket Nos. 14-0212, 13-0285, 12-0298 (cons.).

<sup>22</sup> The reallocation does not affect the total capital costs budgeted for the AMI Plan reflected in ComEd’s Infrastructure Investment Plan.

<sup>23</sup> New business meters for 2015-2018 were accounted for within the program

Capital (\$M)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Approved AMI Plan	0.3	42.6	154.8	195.8	196.1	187.4	149.9	2.9	3.5	3.6	936.9
(Updated AMI Plan) - 2015 AIPR Budget	0.3	42.6	151.6	242.5	191.7	172.9	126.9	16.4	4.1	4.2	953.2
Variance (Increase Spend) Decrease Spend	-	-	3.2	(46.7)	4.4	14.5	23.0	(13.5)	(0.6)	(0.6)	(16.3)

O&M (\$M)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Approved AMI Plan	18.4	29.3	48.9	50.9	56.1	58.8	67.1	44.6	46.4	47.3	467.8
(Updated AMI Plan) 2015 AIPR Budget	18.4	29.3	45.1	62.0	63.2	64.5	70.9	46.9	46.4	47.3	494.0
Variance (Increase Spend) Decrease Spend	-	-	3.8	(11.1)	(7.1)	(5.7)	(3.8)	(2.3)	0.0	0.0	(26.2)

Table 8 - Capital and O&M Spend Profile AMI Deployment

**D. Appendix G (List of AMI Investments)**

The AMI investments undertaken in 2014 and scheduled under the Current Plan for 2015 are set forth in the table below:

(\$ in 000's)	2014 (Actual)			2015 (Projected)		
	Capital	O&M	Total	Capital	O&M	Total
Meters	\$101,129	\$8,822	\$109,951	\$196,859	\$17,099	\$213,958
Communication System	\$7,996	\$5,723	\$13,719	\$12,762	\$6,816	\$19,578
IT Applications and Operations	\$39,504	\$14,648	\$54,152	\$27,635	\$19,037	\$46,672
Project Management and Other Costs	\$2,999	\$15,927	\$18,926	\$5,250	\$19,073	\$24,323
<b>Total</b>	<b>\$151,628</b>	<b>\$45,120</b>	<b>\$196,748</b>	<b>\$242,506</b>	<b>\$ 62,025</b>	<b>\$304,531</b>

**2014 – Actual Spend**

*Meters*

The meter costs for 2014 were primarily related to the purchase and installation of meters. Other costs include tools and other materials associated with meter installation, meter inventory management, and electrician repairs to customer-owned meter-related equipment.

#### *Communication System*

The Communication System costs for 2014 were primarily associated with the purchase and installation of field network equipment for the deployment of the AMI communication system. This category also contains charges for the AMI technology provider SSN, including materials, maintenance of the required SSN IT hosting environment, professional services support, software fees, and server costs.

#### *IT Applications and Operations*

IT Applications and Operations costs for 2014 included the planning, technical architecture design and initiation of the Meter Data Management System replacement and associated systems integration work to support full deployment of AMI. Additionally, costs were incurred for the ongoing IT maintenance of the hardware and software used to support the operation of the AMI meters installed and the associated data analytics.

#### *Project Management and Other Costs*

The Project Management and Other Costs for 2014 were related to project management activities, operations of the meters installed, meter deployment planning, ongoing planning and execution of customer experience activities, and business process redesign and change management activities. Additional cost components included ongoing planning and rollout of customer outreach and education activities and labor costs for revenue protection work.

### **2015 – Projected Spend**

The cost categories described below contain costs that vary with the volume of meters installed. The types of labor and material projected in 2015 will include, but are not limited to, meters, labor, hardware, software, and communications equipment.

#### *Meters*

The meter costs for 2015 primarily relate to the purchase and installation of meters. Other costs include tools and other materials associated with meter installation and meter inventory management along with electrician repairs to customer-owned meter-related equipment.

#### *Communication System*

The Communication System costs projected for 2015 relate primarily to the purchase and installation of field network equipment for the deployment of the AMI communication system.

This will also include charges for SSN, including materials, maintenance of required SSN IT hosting environment, professional services support, software fees, and server costs.

### *IT Applications and Operations*

Projected IT Applications and Operations costs for 2015 are for the automation of the remote connect/disconnect switch and enhancements to the Peak Time Savings program for execution and ongoing management of Demand Response events. Additionally, costs are for the completion of the Meter Data Management System enhancements to support full deployment of AMI, including the ongoing enhancement of the AMI systems and functionality.

### *Project Management and Other Costs*

The Project Management and Other Costs for 2014 are for project management activities, operations of the meters installed, meter deployment planning, ongoing planning and execution of customer experience including the call center and customer relations, and business process redesign and change management activities. Additional cost components are related to ongoing rollout of customer outreach and education activities.

## **III. Customer Applications**

### **A. Introduction**

ComEd is working to bring forth new products and services that will help customers realize and increase the tangible value they can get from a smart meter. As the rollout of more than four million smart meters throughout ComEd's service territory progresses, more and more ComEd customers benefit from the innovative programs, technology and cost savings enabled by the smart grid.

In 2014, ComEd created, evaluated, and implemented a number of programs to bring the functionality and value of the smart grid to our customers. To further support the effort to identify new innovative tech solutions that could leverage AMI and AMI-related technology, ComEd launched the "SmartGridExchange<sup>SM</sup>" initiative (SGE), which focuses on developing collaborations with manufacturers, developers, entrepreneurs, technology start-ups, universities, and students in order to continually search for additional ways to deliver smart grid and smart meter-enabled benefits to our customers. The collaborations and initiatives under the SmartGridExchange<sup>SM</sup> aim to explore, design, and shape the development of products and services that take smart grid and smart meter-enabled technology into the home in innovative ways that give customers more control and additional saving opportunities.

Specifically, ComEd has worked to:

- **Deliver** – Where possible, work to provide products and services directly to interested customers, including PTS and Residential Real Time Pricing ("RRTP")

- **Enable** – Support third party development of new applications, products, and services that could run on ComEd’s platform, as well as on vendor and contracted third party platforms. One such initiative ComEd has launched is Residential Data Access, which provides personalized insights for customers with smart meters, available online and through a Customer Service Representative (CSR).
- **Collaborate** – Collaborate with developers who have technologies or concepts that could bring value to customers; under the Grid Enhancement Retailer Collaboration initiative, ComEd has collaborated with major home appliance retailers to educate and promote connected home products and smart home platforms to ComEd customers.
- **Facilitate** – Facilitate customers’ ability to access new cutting-edge products, tools, and services on the marketplace that could yield energy savings and/or more control over their energy use or convenience. In 2014, ComEd launched a pilot with Nest to offer select customers the Nest Learning Thermostat™ and its innovative demand response and energy-saving features.
- **Inform** – Increasingly serve as a hub for information that offers our customers and the marketplace a convenient portal where they can learn about and share information regarding new and developing energy products and services; ComEd seeks to serve as an online clearinghouse for information as well as provide information to stakeholders, industry, and customers through initiatives such as the SmartGridExchange<sup>SM</sup> Forum.

In 2015, ComEd will continue its efforts in deployment in-progress and planned new products and services. For example, in late 2014 ComEd launched the Smart Meter Connected Devices (“SMCD”) pilot which allows residential customers to connect and use wireless devices to receive immediate, detailed energy-usage information from their smart meter to help monitor and manage their electric bills. This initiative will help translate smart grid and smart meter-enabled benefits to customers via a platform of meter-connected devices. ComEd will further demonstrate the value of the smart grid unlocking more choice and control for customers with initiatives such as Residential Metered Usage Data (RMUD), which enables residential electric suppliers to offer ComEd customers competitive demand response, Time of Use, and dynamic pricing offers.

As ComEd delivers on the potential of the smart grid by continuing to launch programs and services under SGE in 2015, ComEd will conduct further technology research in order to survey new opportunities in the market and continuously review and evaluate new concepts and initiatives. As the smart meter rollout continues to progress in 2015, more and more ComEd customers will benefit from the innovative programs, technology and cost savings enabled by the smart grid.

## B. 2014 Activities and Accomplishments

ComEd has undertaken a series of efforts targeted towards delivering value to our customers through the SmartGridExchange<sup>SM</sup> initiative and other important AMI, energy efficiency, and smart grid-related pilots and projects below.

2014 Activities			
Enabling Customer Choice and Control	Peak Time Savings (“PTS”)	Opt-in demand response program offered to residential customers with smart meters that pays enrolled customers for using less electricity on select summer Peak Time Savings Hours when electricity demand is typically high.	
	Residential Real Time Pricing (“RRTP”)	AMI enabled enhancements to a dynamic pricing option lets residential customers pay a rate based on the hourly market prices for electricity.	
	Residential Data Access	Personalized insights for customers with smart meters made available online and through a CSR.	
	Rider Residential Meter Usage Data	Enables Residential Electric Suppliers to offer Time of Use, demand response, and dynamic pricing products to customers.	
	C&I Engagement Platform	Providing C&I customers with a platform to gain energy insights and take advantage of Time of Use pricing.	
	Electric Vehicles	Deploying EV charging infrastructure and expanding ComEd EV fleet.	
Energy Efficiency Through Innovation	Nest Pilot	ComEd partnered with Nest to offer demand response and energy-saving features.	
	Smart Meter Connected Devices	A platform allowing customers to connect devices to their smart meter to view real-time energy consumption.	
	Smart Streetlights	Deploying a smart LED streetlight solution leveraging ComEd’s smart meter communications network.	
	DETech Enterprise Plug Load Management Research Project	Evaluating the customer benefits of plug-load appliance energy management for commercial use.	
	Bigdely Pilot	Opt-in program deploying Bigdely’s platform to provide customers with a breakdown of energy cost associated their appliances.	
Grid Enhancement Retailer Program	Collaborations with several retailers to co-promote AMI-enabled programs, products while educating customers on smart meters.		

<b>Collaboration</b>	Student Innovation Contest	Challenged local colleges and universities to create innovative smart meter-related products to empower low-income customers.	
	Local Developer Collaboration	Continues to collaborate with the Illinois Energy Foundry, a nonprofit venture fund fostering the development of innovative Smart grid-related businesses in Illinois	

## 1. Enabling Customer Choice and Control

In 2014 ComEd introduced a suit of programs, tools and products that leverage AMI technology to deliver greater choice and control.

### a. Peak Time Savings (“PTS”)

In the fall of 2014, ComEd launched enrollment for Peak Time Savings (PTS)<sup>24</sup> – an opt-in demand response program offered to all residential customers who have smart meters, regardless of their electric supplier. There is no cost to enroll and no penalty or payment if customers enroll and choose not to reduce usage during an event. The program, a first-of-its-kind program to be offered to customers in the Midwest, pays enrolled customers for using less electricity on select summer Peak Time Savings Hours when electricity demand is typically high. PTS launched enrollment in the fall of 2014 and approximately 20,000 customers enrolled in the first 90 days. PTS events will start in the summer of 2015.

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<sup>24</sup> The Commission approved ComEd’s proposed Rider PTR – Peak Time Rebate (“Rider PTR”), marketed to customers as the “Peak Time Savings” or “PTS” program, in ICC Docket No. 12-0484.

## How Customers with a Smart Meter participate in Peak Time Savings:



### Welcome to PEAK TIME SAVINGS

Peak Time Savings is a program from ComEd that pays you back for using less electricity when it is most in demand. Earn a credit on your electric bill when you participate voluntarily on days with Peak Time Savings Hours.

Peak Time Savings Hours will typically occur for a few hours between 11 a.m. and 7 p.m. during the summer—when most air conditioners are on, stores are open and factories are running.



ComEd will announce **three to five** days with Peak Time Savings Hours during the summer of 2015.

Reduce your use and save!

### HOW IT WORKS:

#### NO RISK, NO PENALTY, NO WORRIES

There is no cost to enroll in the Peak Time Savings program. And there is no penalty if you enroll and don't participate. You just won't earn a credit on your electric bill for that day and you can still participate in future Peak Time Savings Hours.

#### ENROLL



Enrollment is now open to participate in the 2015 summer season. You can remain in the program for as long as you like. Visit [ComEd.com/PTS](http://ComEd.com/PTS) or call 844-852-0347.

#### GET NOTIFIED



ComEd will notify you on the day when Peak Time Savings Hours will occur. Choose your preferred method of notification when you enroll—phone call, text message or email. We'll notify you that morning as early as 9 a.m. or at least 30 minutes prior to the start.

#### REDUCE & SAVE



During Peak Time Savings Hours, use less electricity and earn a credit on your electric bill. The amount you earn will be based on your current electricity usage. See chart for examples of what you can do during Peak Time Savings Hours and how much you can potentially earn.\*

ACTIONS What can your household do during Peak Time Savings Hours?	POTENTIAL EARNINGS How much can you earn?
Delay using your dishwasher, vacuum, clothes dryer, lighting or electronics	EARN \$1-\$3 credit on your bill
Take the actions above, plus set the thermostat 4 degrees higher	EARN \$4-\$12 credit on your bill



When you participate, ComEd will credit your monthly bill for reducing your electricity use during Peak Time Savings Hours. A credit will appear as actual dollars off the total amount due on your next electric bill or the following bill. And you'll help reduce the need for fossil-fuel power plants which helps the environment.

Smart meters are a key part of ComEd's effort to show customers the value of a smart grid-enabled future, and PTS offers a tangible benefit to the consumer from ComEd's AMI investment. ComEd is offering PTS to encourage customers to use less electricity during high-demand times, when most air conditioners are on, stores are open, and factories are running. Managing high-demand periods can help reduce the need for additional generation capacity as well as potentially lower emissions due to reduced loads, help reduce the overall cost of electricity supply, and lessen the burden on the electricity delivery system, all while saving customers money.

ComEd continues to participate in the PJM Capacity Market to raise revenue for the credits customers receive through PTS. For the 2017/2018 delivery year, ComEd cleared approximately 50 megawatts ("MW") of capacity for PTS in this auction, which at the auction price of \$106.02 MW/Day will enable ComEd to call approximately ten to forty hours of events in the summer of 2017 depending on participation levels.

PTS also complements the various smart grid and smart meter-enabled programs ComEd is offering under the SmartGridExchange™ initiative. From the Nest and Smart Meter Connected Devices pilots, the Grid Enhancement Retailer Collaboration, the home energy management platforms and devices, appliances and mobile applications ("apps") promoted by SGE initiatives will help customers take full advantage of PTS.

The PTS program is a valuable opportunity for customers with a smart meter to take control and save money on their electric bill. Offering customers technology that automatically responds to