

# **Commonwealth Edison Company's**

## **Infrastructure Investment Plan**

### **Attachment 2: 2014 Investment Plan**

**April 1, 2014**

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## **Executive Summary**

### **Plan Overview**

On November 8, 2011, Commonwealth Edison Company (“ComEd”) filed its proposed performance-based formula rate, Rate DSPP – Delivery Service Pricing and Performance (“Rate DSPP”), with the Illinois Commerce Commission (“Commission”) pursuant to Section 16-108.5 of the Public Utilities Act (“Act”). The Commission commenced Docket No. 11-0721 to review that filing. In making that filing, ComEd confirmed that it elected to become a “participating utility”, and committed to undertake the investments described in Section 16-108.5(b) of the Act. Section 16-108.5(b) also called on ComEd, within 60 days of such filing, to submit a plan for satisfying its infrastructure investment program commitments, which must include information regarding scope, schedule and staffing. ComEd submitted its Infrastructure Investment Plan (“Plan”) to the Commission on January 6, 2012. Section 16-108.5(b) further requires ComEd, no later than April 1 of each subsequent year, to submit to the Commission a report that includes any updates to the Plan, a schedule for the next calendar year, the expenditures made for the prior calendar year and cumulatively, and the number of full-time equivalent jobs created for the prior calendar year and cumulatively.

Accordingly, ComEd submits to the Commission together with its 2014 Annual Update to the Plan (“2014 Annual Update”), this 2014 Investment Plan (“2014 Plan”), for informational purposes, as prescribed by the Act. Consistent with ComEd’s Plan and

2014 Annual Update, this 2014 Plan organizes individual projects under two broad categories of investment:

*Reliability-Related Investments:* Investments in electric system upgrades, modernization projects, and training facilities; and

*Smart Grid-Related Investments:* Investments in Smart Grid electric system upgrades and transmission and distribution infrastructure upgrades and modernization.

This 2014 Plan includes an estimated total of \$207 million of capital investment and associated expense in electric system upgrades, modernization projects, and training facilities (“Reliability-Related Investments”). The 2014 Plan also includes an estimated total of \$159 million of capital investment and associated expense in Smart Grid-Related Investments.

In the event that Section 16-108.5 becomes inoperative or Rate DSPP is terminated, then the Plan, including but not limited to all programs and investments, will also become inoperative and terminate immediately.

### **Summary 2014 Plan Scope**

The 2014 Plan provides information on scope, schedule, budget, staffing, and units of work that are planned to be completed in 2014 in association with ComEd’s Plan and 2014 Annual Update.

***Reliability-Related Investments.*** These programs are described in detail in Section I of the 2014 Plan, and include, but are not limited to, the following specific programs briefly described below:

- **Underground Residential Cable (“URD”) injection and replacement.** This program is designed to remediate an estimated 586 miles of bare concentric cable in 2014, some of which was installed as early as 1966. This work will reduce long duration outages primarily experienced in residential subdivisions.
- **Mainline cable system refurbishment and replacement.** As noted in ComEd’s 2014 Annual Update, this is the most complex of all the Reliability-Related Investments. This program includes planned assessment of an estimated 6,400 manholes and performing refurbishment within the parameters of the Act, replacement of an estimated 114 miles of mainline underground cable, and testing of an estimated 133 sections of mainline cable over the course of 2014. This program is primarily targeted at the testing and replacement of lead cable in urban areas. Because remediation scope is based on inspection results, the complex nature of the underground system, interrelationship of multiple circuits within a manhole, and certain potential moratoriums on work, this program continues to contain the highest degree of scope uncertainty of all the Reliability-Related Investments. This 2014 Plan incorporates insights gained through implementation in 2013, as will future-year plans.
- **Ridgeland 69 kilovolt (“kV”) cable replacement.** This program involves planned replacement of an estimated 4.7 miles of high voltage (69kV) underground cable in 2014, a majority of which was installed in the early 1950’s, and some as early as 1927.
- **Construction of training facilities.** This program provides for planned construction of two new facilities – one in Chicago and one in Rockford (now completed) – to

provide electric and customer operations training. These facilities will provide the ability to offer year-round practical, hands-on training to ComEd's field employees and will enable them to practice classroom theory on real equipment and technology year-round. The construction of the Chicago training facility is planned to begin in 2014 and be completed during 2015.

- **Wood pole inspection, treatment, and replacement.** There are approximately 1.5 million wood poles on the ComEd system. This program entails planned inspection and treatment of an estimated 150,750 wood poles, and replacement or reinforcement of an estimated 4,000 poles over the course of 2014. This program will reduce customer interruptions due to wood pole failures by programmatically assessing the strength and integrity of ComEd's wood poles.
- **Storm hardening.** This program is designed to further reduce the susceptibility of circuits to storm-related damage, and will include deployment of a variety of engineered solutions including, but not limited to, overhead-to-underground conversion, installation of tree-resistant conductors, and additional vegetation management. In order to optimize customer benefits, circuits will be prioritized based on historical susceptibility to storm-related damage. Engineered solutions will be designed specifically for each circuit.

More detailed descriptions for each of these, including scope, schedule, capital budget, staffing and units of work are included in Section I of this document.

**Smart Grid-Related Investments.** These programs are described in detail in Section II of this 2014 Plan, and include, but are not limited to, the following specific programs briefly described below:

- **Distribution Automation (“DA”).** DA technology uses “sectionalizing” devices and remote communications to detect issues on the distribution system and automatically re-route power to minimize the number of customers impacted. This is commonly referred to as the self-healing nature of the Smart Grid. ComEd’s DA program includes installation of an estimated 638 DA devices over the course of 2014, as well as the necessary secure communications infrastructure.
- **Substation micro-processor relay upgrades.** This program is designed to modernize two ComEd substations in 2014, including the upgrade of electro-mechanical protective relays to modern microprocessor-based devices, replacement of aging circuit breakers, two-way communications between ComEd’s control center and each substation, and installation of technology to remotely monitor the health of ComEd’s largest assets, its transformers. This program provides for fault detection, remote asset monitoring and improved site security. Partial upgrades may be applied across the service territory. ComEd has over 250 transmission-fed substations, and over 800 substations in total.
- **Smart Meters.** At the completion of this program, all retail meters on the ComEd distribution system will have been replaced with Smart Meters, including deployment of an Advanced Metering Infrastructure (“AMI”), which provides a two-way communications infrastructure to support other customer services and Smart Grid applications. Expected benefits include reductions in the number of estimated bills, unaccounted for energy, consumption on inactive meters and uncollectible expense. Deployment of AMI will occur pursuant to the Advanced Metering Infrastructure Deployment Plan (“AMI Plan”) approved by the Commission in Docket No. 12-0298

and further modified in Docket No. 13-0285.<sup>1</sup> The AMI Annual Implementation Progress Report filed on April 1, 2014, provides further detail on the deployment results thus far and the remaining scope of the program.

- **Associated cyber-secure data communications network.** A cyber-secure data communications infrastructure will be incorporated into each functional area of the Smart Grid. It includes implementation of a robust security model that is aligned with industry best practices and existing security standards. This security model will address confidentiality, integrity, availability and non-repudiation of data transport through the network.

More detailed descriptions for each of these, including scope, schedule, capital budget, staffing and units of work are included in Section II of this 2014 Plan.

### **Summary 2014 Plan Schedule**

In order to establish a framework to plan for and schedule future work while efficiently addressing inherent change and uncertainty, ComEd is employing a proven iterative planning structure. Under this structure, work plans will be developed on a rolling basis for each quarter of the investment period. Each work plan will outline a series of tasks comprising: project and work planning, design, regulatory and public affairs functions where required (e.g., permitting), project implementation, and review.

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<sup>1</sup> Please note, however, that on March 13, 2014, ComEd filed a Verified Petition for Expedited Approval of Acceleration of Meter Deployment under ComEd's AMI Plan ("Petition"), which proposes to complete Smart Meter deployment three years earlier than the timeline set forth in the current AMI Plan. ComEd's Petition is pending in ICC Docket No. 14-0212.

This periodic quarterly cycle is illustrated throughout this 2014 Plan in a series of Gantt charts showing repeating cycles of work planning and management activity. Please note that while this work planning and management cycle repeats on a quarterly basis, the activities associated with each quarter's iteration may take longer than a quarter to complete. This structure allows ComEd to implement its multi-year Plan effectively and rigorously, while retaining the required flexibility.

The individual program schedules included in this 2014 Plan explain when each program is planned to start and end. Most include both rolling quarterly work plan process and a high-level task list. The Gantt charts that appear in this 2014 Plan are illustrative and are not intended to establish specific milestones. It is recognized that scope priorities will be adjusted over the course of the programs as new information is obtained. Detailed 2014 schedules for specific program areas are provided in the sections that follow.

### **Summary 2014 Plan Budget**

The program budget identifies the planned monthly capital cost for each program. The 2014 Plan budget total is estimated to be \$366 million in incremental capital investments plus associated expenses. Table A.1 in Appendix A presents a summary of the 2014 Plan's estimated total capital budget by program, and Figure A.2 in Appendix A presents the estimated total capital budget by month associated with the 2014 Plan.

## Summary 2014 Program Staffing

Program staffing identifies the 2014 full-time equivalents (“FTEs”) required for completion of program scope of work. FTEs have been calculated by taking the estimated Direct and Contractor worker-hours to execute the Plan and dividing by 2,080 hours. Estimated worker-hours for Direct jobs and Contractor positions are each composed of the following two sub-categories:

**Assigned:** Worker-hours assigned to specific work orders associated with Plan program scopes of work; and

**Support:** Worker-hours charged on timesheets in support of the Plan

Support FTEs are not allocated to specific Plan scopes of work, and are not presented in the FTE sections for individual programs in this 2014 Plan.<sup>2</sup> Rather, Figure A.3 in Appendix A presents the estimated Assigned FTEs and Support FTEs to execute the entire scheduled scope of work associated with the 2014 Plan. This format for presentation of Assigned FTEs and Support FTEs is consistent with ComEd’s timekeeping approach and represents a more accurate representation of how Support FTEs are allocated to Plan execution. Estimates for Support FTEs in the 2014 Plan are based, in part, on the 2012 and 2013 actual proportion of Assigned FTEs to Support FTEs.

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<sup>2</sup> While this format is consistent with that presented in ComEd’s 2013 Annual Update, please note that this is a change in format from ComEd’s Plan, in which Support FTEs were allocated to specific scopes of work proportionally, based on estimated investments for specific scopes of work.

Job classifications associated with Assigned FTEs and Support FTEs may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support and craft. FTEs are not defined as employee head counts, and should not be confused with employment levels and trends.

The estimated FTEs presented in this 2014 Plan include Direct and Contractor FTEs, however, they do not include any Induced FTEs.

### **Summary 2014 Plan Quantity of Units**

The program quantity of units describes the estimated number of work units, where applicable, that are planned to be completed in 2014 for each program area. Units of work for each program are discussed, as applicable, in that program's respective section of the 2014 Plan. All units of work associated with the identified work scopes are included in the estimated quantities in this document, and will be counted towards achievement of the 2014 Plan goals. However, this does not limit additional units from being performed as part of the baseline spend at ComEd's discretion. The monthly targets listed are not intended to be firm milestones, but rather to provide directional guidance towards accomplishment of the annual goals.

## **SECTION I: Reliability-Related Investments**

### **SECTION I.A: Underground Residential Cable (“URD”) Injection and Replacement**

#### **I.A.1: 2014 Program Scope**

ComEd's URD system has approximately 8,700 miles of bare concentric neutral URD cable on its system that was installed between 1966 and 1985, which is primarily used to serve residential and commercial areas. The URD Injection and Replacement program excludes mainline direct buried cable, which is covered under the Mainline Cable System Refurbishment and Replacement program described in Section I.B below. URD cable failures mainly occur within the population of bare concentric neutral URD cable. As this cable ages, the number of annual failures in this type of cable has been trending up in recent years as this cable continues to age. ComEd anticipates that it will be necessary to inject or replace an estimated 4,370 miles of the problematic cable over the course of the program. ComEd anticipates that, by the end of the program, the number of annual failures in this type of cable will be significantly reduced. This reduction in faults will reduce long-duration outages primarily experienced in residential subdivisions. The program consists of two major components:

- URD Cable Injection
- URD Cable Replacement

Each of these components is described in more detail below.

### URD Cable Injection

Cable injection fills in cable insulation voids and avoids cable failures. In general, URD cables that are candidates for injection typically have intact concentric neutral conductors, are not solid cable or strand-filled cable, and have a low number of cable splices. Where it is practical, cable injection is typically a more cost beneficial way to avoid URD cable failures than cable replacement. Based on ComEd's past experience with URD cable injection, it is expected that during 2014 an estimated 97 miles of URD cable will be injected.

### URD Cable Replacement

URD cables that cannot practically or economically be injected will be replaced on a schedule prioritized to replace the worst-performing URD cables first. It is expected that during 2014 an estimated 489 miles of URD cable will be replaced.

#### **I.A.2: 2014 Program Schedule**

Figure I.A.2 presents the planned 2014 schedule to complete the URD Injection and Replacement program. Estimates of cost, units of work, and schedules for that work may evolve over time. The schedule consists of summary level tasks for the scope of work associated with the 2014 Plan, including the following key tasks:

- Mobilization and ramp-up
- Establish priority for the calendar year
- Perform scoping
- Perform design tasks, procure material, and identify required outages in schedule
- Planning (develop work packages and secure permits)

- Construction – Boring, injection or replacement
- Construction – Splicing where required
- Test and liven
- Landscaping restoration

**FIGURE I.A.2: URD INJECTION AND REPLACEMENT 2014 SCHEDULE**

Activity ID	Activity Name	Cal. Days	Start	Finish	2014				2015				2016				2017				
					Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
<b>CIIP - Underground Residential Cable (URD) Injection &amp; Replacement</b>																					
<b>Underground Residential Cable (URD) Injection &amp; Replacement</b>																					
URD2-13-2-0600	Construction - Splicing for 2013 4th Q	180	04-Jan-14 A	05-Jul-14																	
URD2-13-2-0610	Test & Liven 2013 4th Q	180	02-Feb-14*	02-Aug-14																	
URD2-13-2-0700	Landscaping Restoration for 2013 4th Q	180	02-Feb-14*	02-Aug-14																	
URD2-13-3-0100	Work Priority for 2014	0	02-Jan-14*																		
URD2-13-3-0400	Planning for 2014 1st Q	90	04-Jan-14 A	04-Apr-14																	
URD2-13-3-0500	Construction - Boring, Inject or Replace for 2014 1st Q	180	04-Mar-14*	02-Sep-14																	
URD2-13-3-0600	Construction - Splicing for 2014 1st Q	180	03-Apr-14*	02-Oct-14																	
URD2-13-3-0610	Test & Liven 2014 1st Q	180	01-May-14	30-Oct-14																	
URD2-13-3-0700	Landscaping Restoration for 2014 1st Q	180	01-May-14	30-Oct-14																	
URD2-13-4-0300	Design / Procure / Outage for 2014 2nd Q	90	02-Feb-14	02-May-14																	
URD2-13-4-0400	Planning for 2014 2nd Q	90	03-Apr-14	02-Jul-14																	
URD2-13-4-0500	Construction - Boring, Inject or Replace for 2014 2nd Q	180	02-Jun-14	02-Dec-14																	
URD2-13-4-0600	Construction - Splicing for 2014 2nd Q	180	02-Jul-14	04-Jan-15																	
URD2-13-4-0610	Test & Liven 2014 2nd Q	180	03-Aug-14	05-Feb-15																	
URD2-13-4-0700	Landscaping Restoration for 2014 2nd Q	180	03-Aug-14	05-Feb-15																	
URD3-14-1-0200	Scoping for 2014 3rd Q	90	04-Mar-14	02-Jun-14																	
URD3-14-1-0300	Design / Procure / Outage for 2014 3rd Q	90	01-May-14	31-Jul-14																	
URD3-14-1-0400	Planning for 2014 3rd Q	90	02-Jul-14	01-Oct-14																	
URD3-14-1-0500	Construction - Boring, Inject or Replace for 2014 3rd Q	180	03-Sep-14	07-Mar-15																	
URD3-14-1-0600	Construction - Splicing for 2014 3rd Q	180	04-Oct-14	07-Apr-15																	
URD3-14-1-0610	Test & Liven 2014 3rd Q	180	04-Nov-14	08-May-15																	
URD3-14-1-0700	Landscaping Restoration for 2014 3rd Q	180	04-Nov-14	08-May-15																	
URD3-14-2-0200	Scoping for 2014 4th Q	90	02-Jun-14	31-Aug-14																	
URD3-14-2-0300	Design / Procure / Outage for 2014 4th Q	90	03-Aug-14	01-Nov-14																	
URD3-14-2-0400	Planning for 2014 4th Q	90	04-Oct-14	06-Jan-15																	
URD3-14-2-0500	Construction - Boring, Inject or Replace for 2014 4th Q	180	06-Dec-14	08-Jun-15																	

**I.A.3: 2014 Program Budget**

Figure I.A.3 represents the estimated 2014 capital budget for the URD Injection and Replacement program. ComEd estimates the 2014 program cost to be capital investments of \$79 million plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

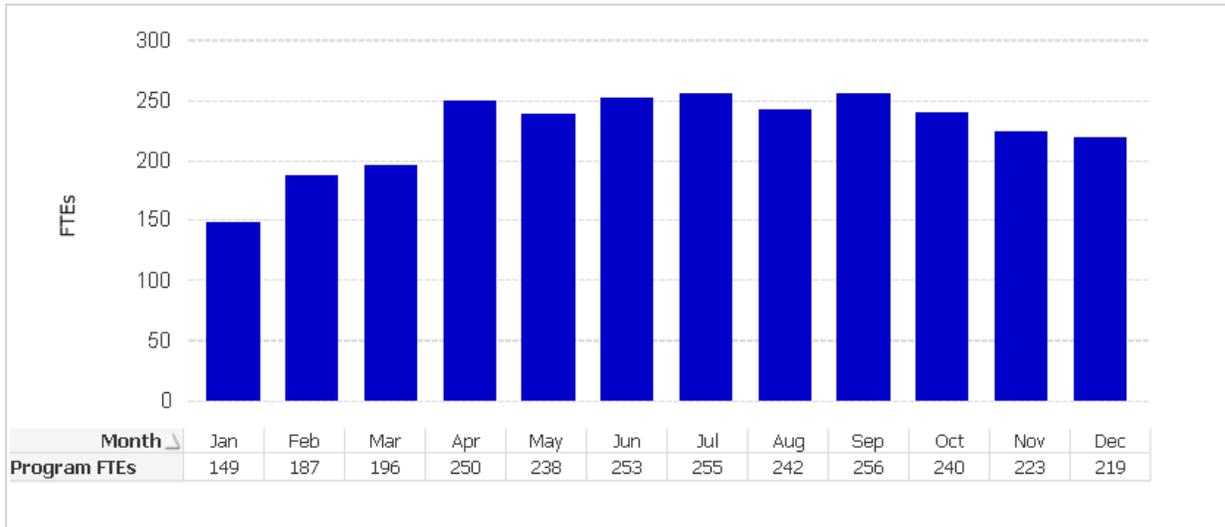
**FIGURE I.A.3: URD INJECTION AND REPLACEMENT 2014 CAPITAL BUDGET**



**I.A.4: 2014 Program FTEs**

Figure I.A.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure I.A.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

**FIGURE I.A.4: URD INJECTION AND REPLACEMENT 2014 ASSIGNED FTEs**



### I.A.5: 2014 Program Units

Figure I.A.5.A shows the miles of URD cable estimated to be injected in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. It is estimated that 97 miles will be injected in 2014. Estimates of cost, units of work, and schedules for that work may evolve over time.

**FIGURE 1.A.5.A: URD CABLE INJECTION 2014 UNITS (IN MILES)**

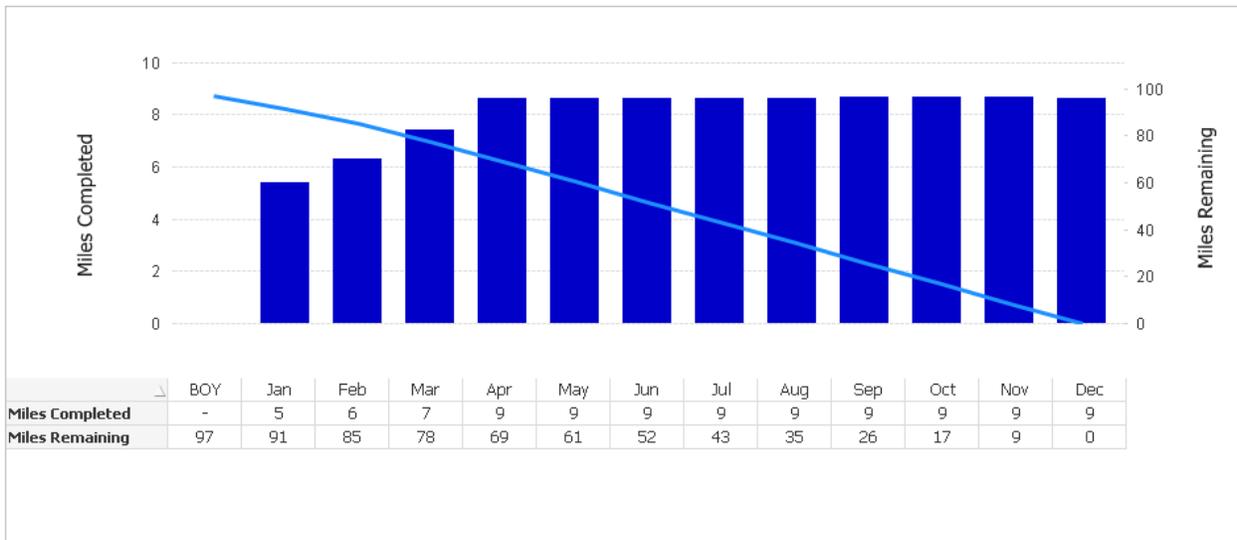
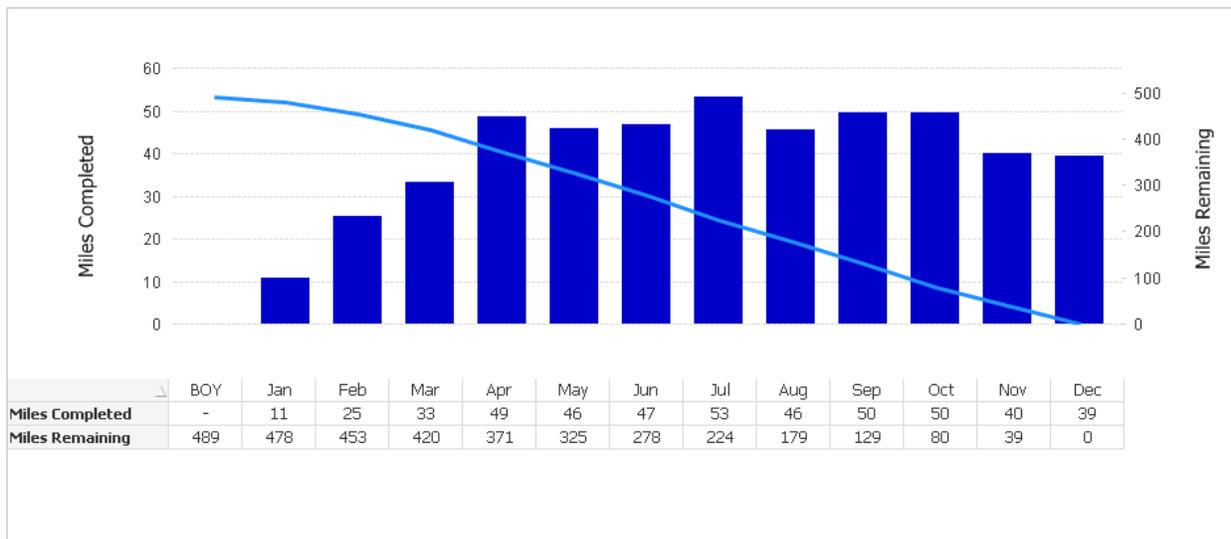


Figure I.A.5.B shows the miles of URD cable estimated to be replaced in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. It is estimated that 489 miles will be replaced during 2014. Estimates of cost, units of work, and schedules for that work may evolve over time.

**FIGURE I.A.5.B: URD CABLE REPLACEMENT 2014 UNITS (IN MILES)**



## **SECTION I.B: Mainline Cable System Refurbishment and Replacement**

### **I.B.1: 2014 Program Scope**

The ComEd mainline underground system includes approximately 8,300 miles of cable installed in conduit systems or direct buried. Mainline cable system refurbishment and replacement has the most complex scope of work of all the programs. The scope is composed of three main work categories:

- Manhole assessment and cable system refurbishment
- Cable replacement
- Cable testing

The accomplishment of this scope is highly dependent on the ability to obtain necessary permits and to schedule equipment outages. Certain periods of time or certain work restrictions, such as summer moratoriums, may limit the types of work that can be performed due to the need to maintain system configuration. Such periods will be reflected in ComEd's annual or summer critical work plans. Because remediation scope is based on inspection results, the complex nature of the underground system, interrelationship of multiple circuits within a manhole, and certain potential moratoriums on work, this program continues to contain the highest degree of scope uncertainty of all the Reliability-Related Investments.

### Manhole Assessment and Cable System Refurbishment

ComEd has an estimated 32,026 manholes on its system. Over the course of 2014, ComEd plans to assess an estimated 6,400 manholes and perform refurbishment within the parameters of the Act.

Assessment includes the evaluation of the overall condition of the manhole, cables, and cable support systems. Refurbishment includes replacing or repairing cable systems in the manhole, and addressing other structural issues as required. Manhole structural work may range from minor refurbishment to replacement of an entire manhole.

Concurrent with manhole assessments, cable joint issues discovered within the manholes (e.g., bulging or leaking joints) will be addressed primarily with cable replacement. As assessments are performed, work plans will be generated to address the findings.

### Cable Replacement

Replacement criteria will be based, in part, on the method of original installation. Replacement of cable in conduit will be based on manhole assessment findings. Direct buried mainline cable will either be replaced without testing, or replaced after testing, based on cable length and prior fault history. It is estimated that 114 miles of mainline cable will be replaced in 2014. This estimate is based on assumptions concerning inspection results, which will be adjusted over time as actual data becomes available. Because of their inherent reliance on assumptions, estimates of cable replacement contain a high degree of uncertainty and are not intended to reflect firm scope.

## Cable Testing

Underground cable is divided into sections largely as a result of limits placed on cable lengths by the manufacturers and limits due to the physical configuration of the circuits.

An estimated 133 circuit sections will be selected in 2014 for Very Low Frequency (“VLF”) Testing per the Institute of Electric and Electronics Engineers (“IEEE”) standard 400.2 to validate the serviceability of the section of cable following manhole refurbishment and mainline cable replacement. The scope is focused on performing “proof tests” at the conclusion of repair activities to validate the serviceability of the section of cable, diagnostic testing for long direct buried sections, and some re-tests following a failure of proof tests or diagnostic tests. It is estimated that cable tests will result in replacement of cable sections, which are included in the estimate shown in the “Cable Replacement” section above. This estimate is based on assumptions concerning inspection results, which will be adjusted over time as actual data becomes available. Because of their inherent reliance on assumptions, early estimates of cable testing contain a high degree of uncertainty and are not intended to reflect firm scope.

### **I.B.2: 2014 Program Schedule**

Figure I.B.2.A presents the estimated 2014 schedule to complete the Manhole Assessment and Cable System Refurbishment program. Estimates of cost, units of work, and schedules for that work may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2014 Plan, including the following key tasks:

- Establish manhole inspection priority for the calendar year

- Perform scoping and configuration analysis; review sequence for capacity issues
- Perform design tasks, procure material, and identify required outages in schedule; include identified joint issues in evaluation
- Planning (develop work packages and secure permits)
- Construction - Manhole cleaning (environmental) if required
- Construction - Conduct manhole assessments and refurbish cable systems as necessary
- Evaluate results
- Develop cable replacement plans as necessary

Figure I.B.2.B presents the estimated 2014 schedule to complete the Mainline Cable Replacement program. The schedule consists of high level tasks for the scope of work associated with this 2014 Plan, including the following key tasks:

- Establish replacement priority for the calendar year
- Perform scoping and configuration analysis; review sequence for capacity issues
- Perform design tasks, procure material, and identify required outages in schedule; include identified joint issues in evaluation
- Planning (develop work packages and secure permits)
- Test cable and liven

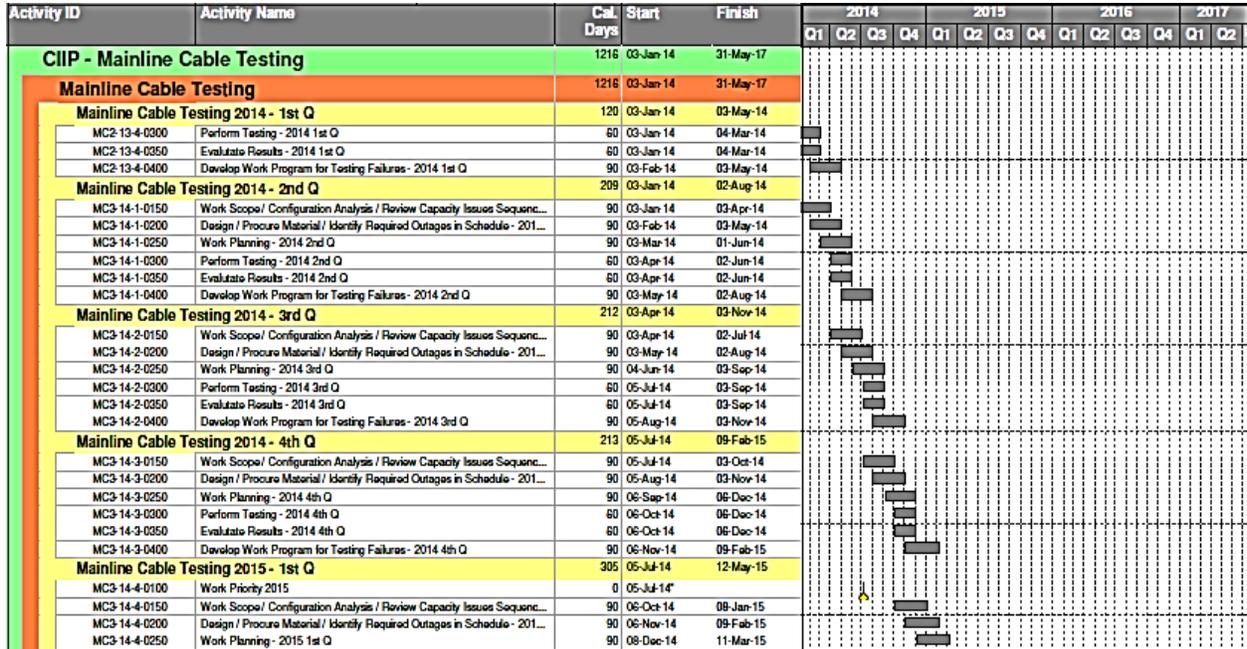
- Construction - Walkdown manhole
- Construction - Remove / Replace cable / Repair leakers
- Construction - Complete terminations

Figure I.B.2.C presents the estimated 2014 schedule to complete the Mainline Cable Testing program. The schedule consists of high level tasks for the scope of work associated with this 2014 Plan, including the following key tasks:

- Establish testing priority for the calendar year
- Perform scoping and configuration analysis; review sequence for capacity issues
- Perform design tasks, procure material, and identify required outages in schedule; include identified joint issues in evaluation
- Planning (develop work packages)
- Perform testing
- Evaluate results
- Develop work program for testing failures (*i.e.*, cable replacement) based on results



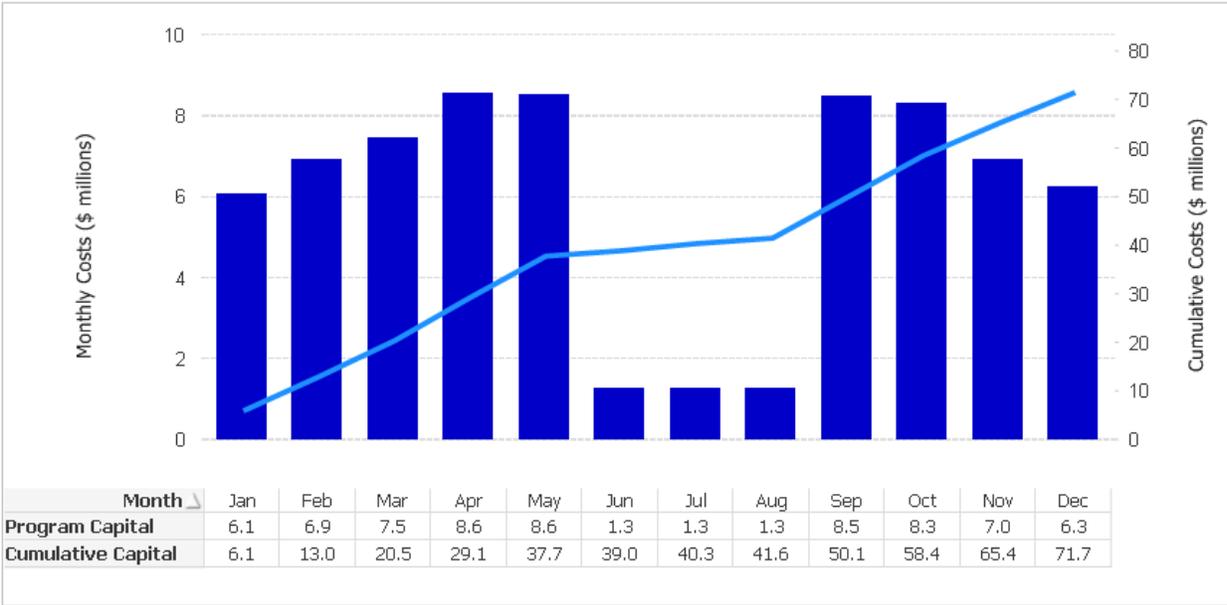
**FIGURE 1.B.2.C: MAINLINE CABLE TESTING 2014 SCHEDULE**



**I.B.3: 2014 Program Budget**

Figure I.B.3 presents the estimated 2014 capital budget for the Mainline Cable System Refurbishment and Replacement program. ComEd estimates the 2014 program cost to be capital investments of \$72 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

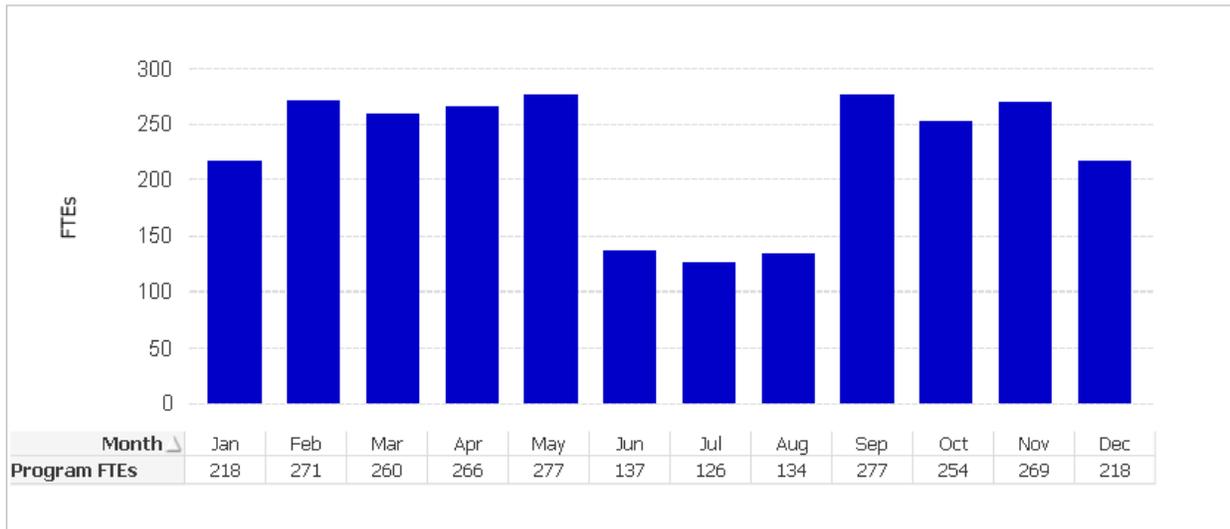
**FIGURE I.B.3: MAINLINE CABLE SYSTEM REFURBISHMENT AND REPLACEMENT 2014 CAPITAL BUDGET**



**I.B.4: 2014 Program FTEs**

Figure I.B.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure I.B.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

**FIGURE I.B.4: MAINLINE CABLE SYSTEM REFURBISHMENT AND REPLACEMENT 2014 ASSIGNED FTEs**

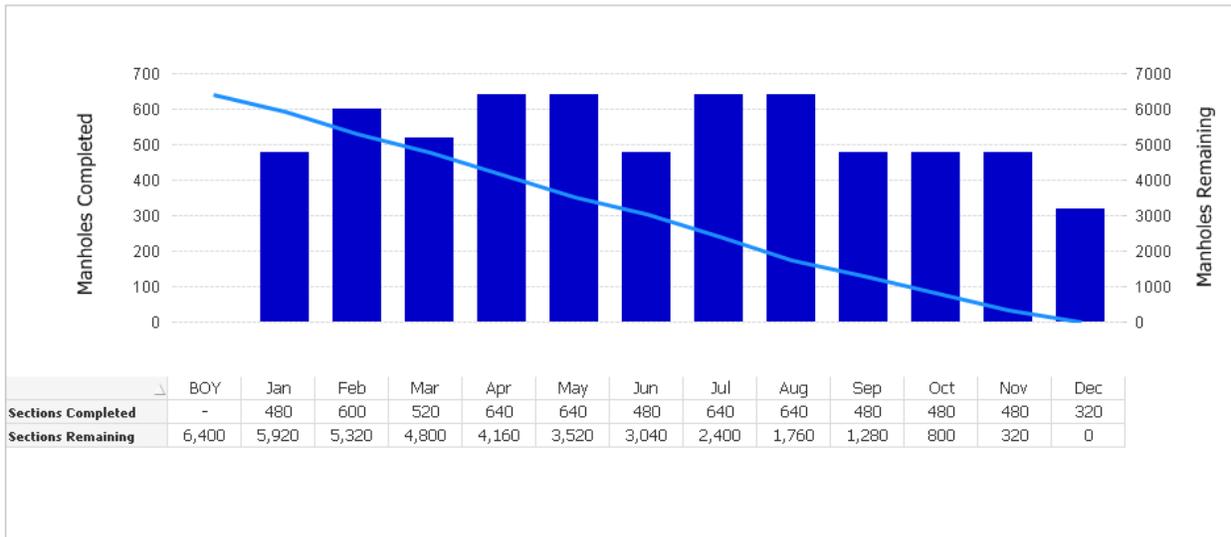


## I.B.5: 2014 Program Units

### Manhole Assessment

Figure I.B.5.A shows the estimated number of manhole assessments to take place over the course of 2014 at 6,400. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. Estimates of cost, units of work, and schedules for that work may evolve over time.

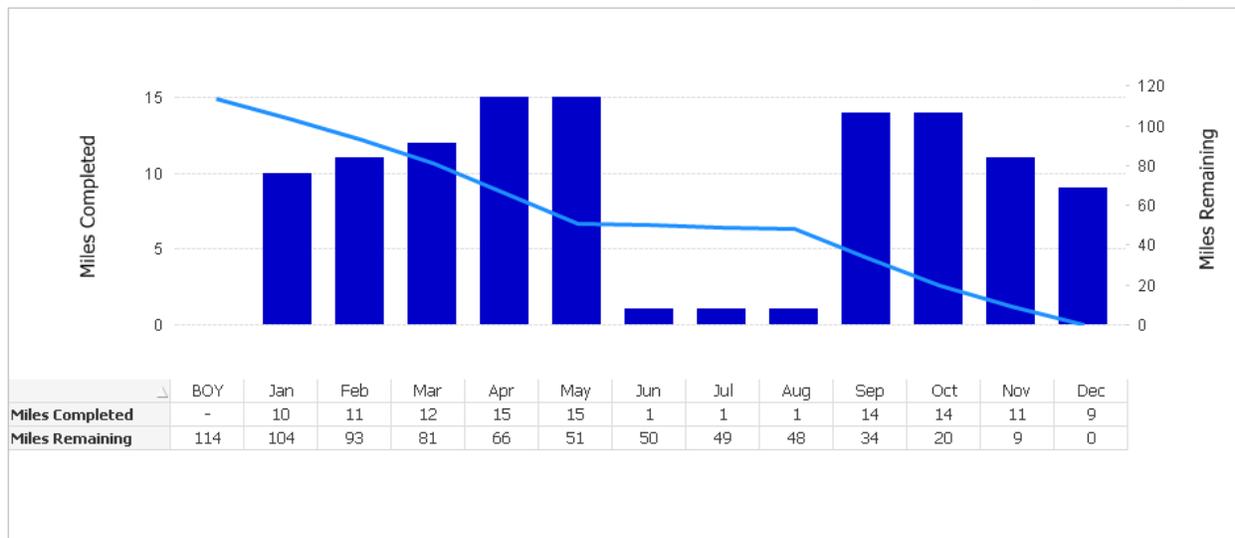
**FIGURE I.B.5.A: MANHOLE ASSESSMENT 2014 UNITS (IN MANHOLES)**



Cable Replacement

Figure I.B.5.B shows the estimated miles of mainline cable to be replaced in 2014. It is expected that some cables will be replaced based on historical performance of the cable, without the need for prior VLF testing. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. The current estimate for replacement in 2014 is 114 miles of mainline underground cable, which includes cables replaced and those that may fail VLF testing. Estimates of cost, units of work, and schedules for that work may evolve over time.

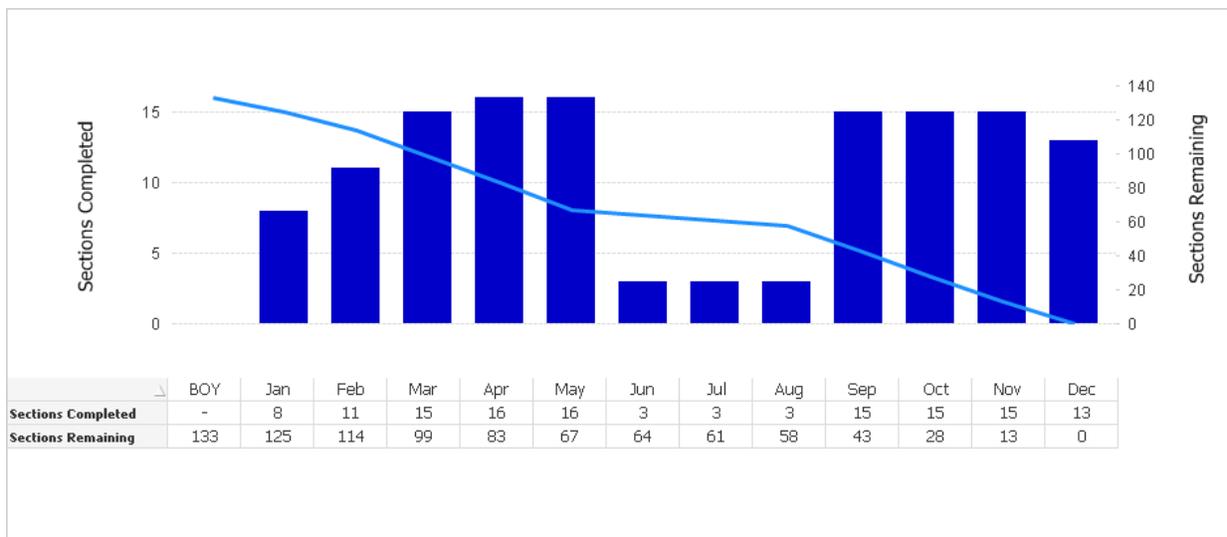
**FIGURE I.B.5.B: MAINLINE CABLE REPLACEMENT 2014 UNITS (IN MILES)**



Cable Testing

Figure I.B.5.C shows the estimated number of sections of mainline cable to be VLF tested in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. It is estimated that 133 sections of mainline cable will be VLF tested in 2014. Estimates of cost, units of work, and schedules for that work may evolve over time.

**FIGURE I.B.5.C: MAINLINE CABLE TESTING 2014 UNITS (IN SECTIONS)**



## **SECTION I.C: Ridgeland 69kV Cable Replacement**

### **I.C.1: 2014 Program Scope**

The Ridgeland 69kV cable system is approximately 40.5 circuit miles, composed of four cable subsystems: Solid Paper Lead (“PL”), Cross-Link Polyethylene (“XLPE”), Low Pressure Fluid Filled (“LPFF”), and High Pressure Fluid Filled (“HPFF”).

The cable replacement program for the Ridgeland area began in 1998, targeting poor-performing paper insulated lines. The majority of the paper insulated lines that are being replaced were installed in the early 1950’s, although some were installed as early as 1927. Replacement of circuits with the reliable XLPE cable systems will increase the long term reliability in the area. The focus of the 2014 program is to replace an estimated 4.7 circuit miles.

### **I.C.2: 2014 Program Schedule**

Figure I.C.2 presents the estimated schedule to complete the Ridgeland 69kV Cable Replacement 2014 scope of work. Estimates of cost, units of work, and schedules for that work may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2014 Plan, including the following key tasks:

- Construction – Identify and cut cable
- Construction – Cable removal and splice removal
- Construction – Install cable
- Construction – Splice cable
- Construction – Build terminations

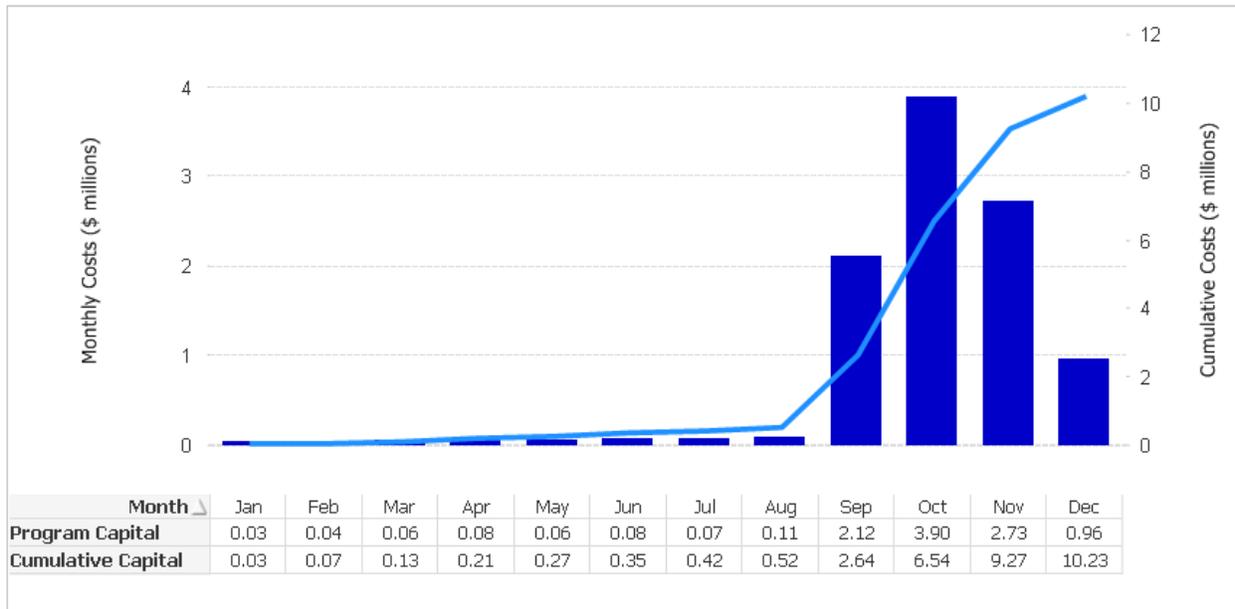
**FIGURE I.C.2: RIDGELAND 69KV CABLE REPLACEMENT 2014 SCHEDULE**

Activity ID	Activity Name	Cal. Days	Start	Finish	2014				2015				2016				2017				
					Q1	Q2	Q3	Q4													
<b>CIIP - Ridgeland 69kV Cable Replacement</b>																					
<b>Ridgeland 69kV Cable Replacement</b>																					
<b>69kV - 2014 [L.19204 Ridgeland TSS 192 to Hawthorne TSS 52]</b>																					
69K2-14-1-1020	Manhole Inspections	20	03-Jan-14	22-Jan-14																	
69K2-14-1-1025	Phase 2 Presentation	28	09-Feb-14	08-Mar-14																	
69K2-14-1-1030	Design Drawings	31	09-Mar-14	08-Apr-14																	
69K2-14-1-1040	Bid & Award Cable	30	09-Apr-14	08-May-14																	
69K2-14-1-1050	Bid & Award Install	30	09-Apr-14	08-May-14																	
69K2-14-1-1060	Outage	120	03-Sep-14	31-Dec-14																	
69K2-14-1-1070	Construction - ID & Cut Cable	5	03-Sep-14	07-Sep-14																	
69K2-14-1-1080	Construction - Cable Removal & Splice Removal	39	10-Sep-14	18-Oct-14																	
69K2-14-1-1090	Construction - Install Cable	40	19-Oct-14	27-Nov-14																	
69K2-14-1-1100	Construction - Splice Cable	13	18-Nov-14	30-Nov-14																	
69K2-14-1-1110	Construction - Build Terminations	5	01-Dec-14	05-Dec-14																	
69K2-14-1-1120	Final Jacket Test	2	10-Dec-14	11-Dec-14																	
69K2-14-1-1125	T&S Install leads @ SS	5	10-Dec-14	14-Dec-14																	
69K2-14-1-1130	Ready to Start Inspection	2	12-Dec-14	13-Dec-14																	
69K2-14-1-1140	24 Hour Soak	2	13-Dec-14	14-Dec-14																	
<b>69kV - 2015 [L.19204 Roosevelt &amp; Kenton Terminal to Columbus Park TSS 30]</b>																					
69K2-15-1-1010	Phase 1 Presentation	28	01-Dec-14*	28-Dec-14																	

### I.C.3: 2014 Program Budget

Figure I.C.3 presents the estimated 2014 capital budget for the Ridgeland 69kV Cable Replacement program. ComEd estimates the 2014 program cost to be capital investments of \$10 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

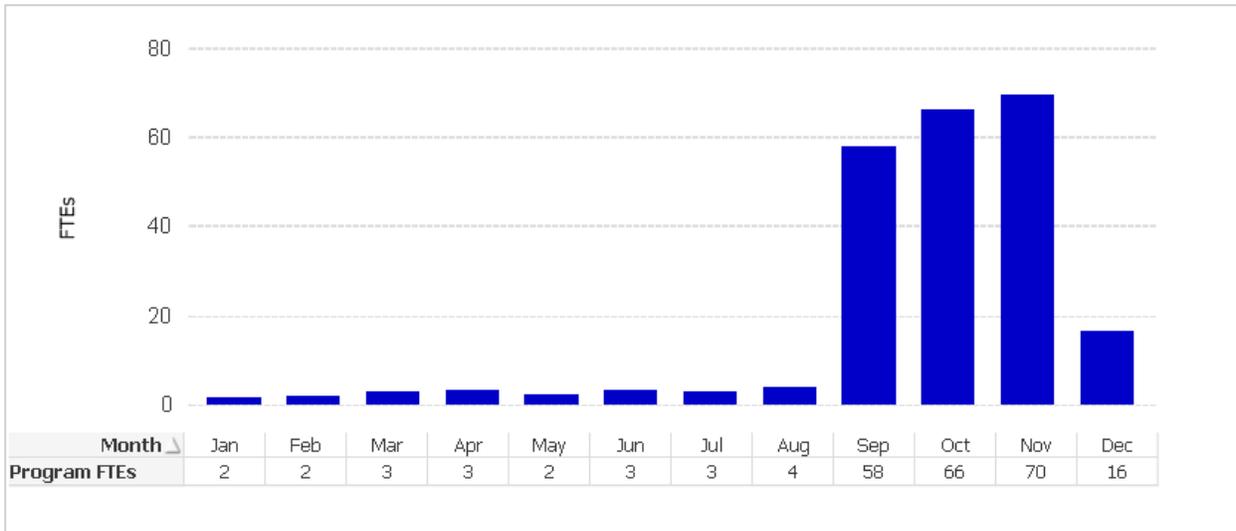
**FIGURE I.C.3: RIDGELAND 69KV REPLACEMENT CAPITAL BUDGET**



**I.C.4: 2014 Program FTEs**

Figure I.C.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure I.C.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

**FIGURE I.C.4: RIDGELAND 69KV CABLE REPLACEMENT 2014 ASSIGNED FTEs**



## **SECTION I.D: Construction of Training Facilities**

### **I.D.1: 2014 Program Scope**

ComEd currently provides electric and customer operations training at five locations within its service territory, with one location being leased and one location using trailers. Under Section 16-108.5(b)(1)(A)(ii), ComEd must undertake training facility construction or upgrade projects. The Section provides that, at a minimum, one facility must be located in a municipality having a population of more than 2 million residents and one facility must be located in a municipality having a population of between 150,000 and 170,000 residents. Accordingly, the Training Facilities program provides for construction or upgrade of two training facilities - one facility to be located in Chicago (approximately 2.7 million residents), and one facility to be located in Rockford (approximately 153,000 residents). ComEd's Rockford Training Center opened in 2012.

#### Chicago Facility

The Chicago facility will be designed for the purpose of obtaining certification under the United States Green Building Council's Leadership in Energy Efficiency Design (LEED) Green Building Rating System. The Chicago facility will be an overhead, underground, substation construction, transmission underground, area operating and distribution operations training facility planned to have the following characteristics:

- Indoor space consisting of classrooms, lecture hall, instructor office space, restroom and locker facilities, indoor equipment area, new technology area, storage, conference room, student break area, meter shop, 26 indoor

underground cable splicing bays, customer education area, and an indoor pole yard.

- Outdoor yard area consisting of approximately 60 poles and associated overhead primary and secondary conductors, overhead equipment, distribution automation equipment, URD distribution equipment, underground manholes and conduit, and substation equipment.

#### **I.D.2: 2014 Program Schedule**

The Training Facilities program is planned to be completed in two phases. The Rockford Facility was completed in 2012, and the Chicago Facility is currently planned for completion in 2015. Estimates of cost, units of work, and schedules for the Chicago Facility may evolve over time. Figure I.D.2 presents the estimated schedule to complete the Chicago Training Facilities program. The schedule consists of high level tasks for the scope of work associated with the 2014 Plan, including the following tasks:

- Mobilization and ramp-up
- Building requirement and location research
- Concept and schematic design
- Construction design
- Construction documents
- Permitting
- Bidding process
- Award contract
- Construction phase
- Grading and foundations

- Building construction
- Paving
- Punch list
- Ramp-down
- Demobilize
- Begin training

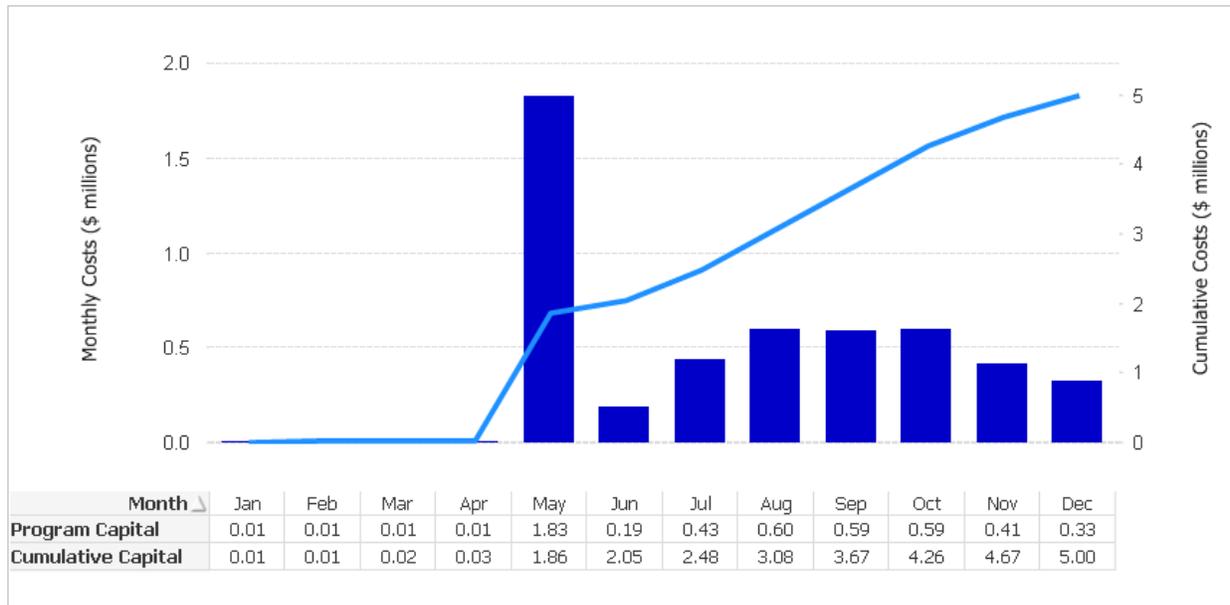
**FIGURE I.D.2: TRAINING FACILITIES 2014 SCHEDULE**

Activity ID	Activity Name	Cal. Days	Start	Finish	2014				2015				2016				2017				
					Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	
<b>CIIP - Training Facilities</b>																					
<b>Training Facilities</b>																					
FR-12-1010	Confirmation of project use and building square footage space program	360	21-Jan-14*	24-Jan-15	■																
FR-12-1020	Confirmation of site needs and area	6	25-Jan-14*	30-Jan-14	■																
FR-12-1030	Property search (size based on building at site needs determined previously)	20	31-Jan-14*	19-Feb-14	■																
FR-12-1040	Initial property selection	10	19-Feb-14	28-Feb-14	■																
FR-12-1110	Zoning analysis	40	19-Feb-14	30-Mar-14	■																
FR-12-1120	Geotechnical investigation	40	19-Feb-14	30-Mar-14	■																
FR-12-1130	Survey & title commitment analysis	40	19-Feb-14	30-Mar-14	■																
FR-12-1140	Easement and encumbrance analysis	40	19-Feb-14	30-Mar-14	■																
FR-12-1150	Site concept plan evaluation	30	19-Feb-14	20-Mar-14	■																
FR-12-1160	Property procurement & closing (based on favorable due diligence analysis)	61	22-Mar-14*	21-May-14	■																
FR-12-1330	Schematic Design: Preliminary meetings with City & other permit authorities	30	17-Mar-14*	15-Apr-14	■																
FR-12-1360	Issue Construction Documents for Bidding	0		09-Jun-14*																	
FR-12-1370	Submit for Building Permit	30	21-May-14*	20-Jun-14	■																
FR-12-1380	Bidding & scope reviews	68	12-May-14*	20-Jul-14	■																
FR-12-1385	Award Construction Contracts	0		21-Jul-14																	
FR-12-1390	Contractor submittals and reviews by design professional	50	21-Jul-14	09-Sep-14	■																
FR-12-1410	Mobilization	2	31-Jul-14	01-Aug-14	■																
FR-12-1420	Property clearing and grubbing	8	24-Jun-14*	01-Jul-14	■																
FR-12-1430	Site work and mass grading	30	02-Jul-14*	01-Aug-14	■																
FR-12-1440	Site Utilities	27	22-Jul-14	17-Aug-14	■																
FR-12-1450	Foundation excavation, forming, pouring and backfill	35	18-Aug-14*	22-Sep-14	■																
FR-12-1460	Building structure erection	115	23-Sep-14*	21-Jan-15	■																
FR-12-1465	Site Work (Pavin etc...)	31	06-Sep-14*	06-Oct-14	■																
FR-12-1470	Building exterior enclosure	21	20-Oct-14	09-Nov-14	■																
FR-12-1480	Mechanical, Electrical, Plumbing & Fire Protection (MEP/FP) rough-in	56	15-Nov-14*	14-Jan-15	■																
FR-12-1490	Interior framing	57	06-Dec-14*	04-Feb-15	■																

**I.D.3: 2014 Program Budget**

Figure I.D.3 presents the estimated 2014 capital budget for the Chicago Training Facilities program. ComEd estimates the 2014 program cost to be capital investments of \$5 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

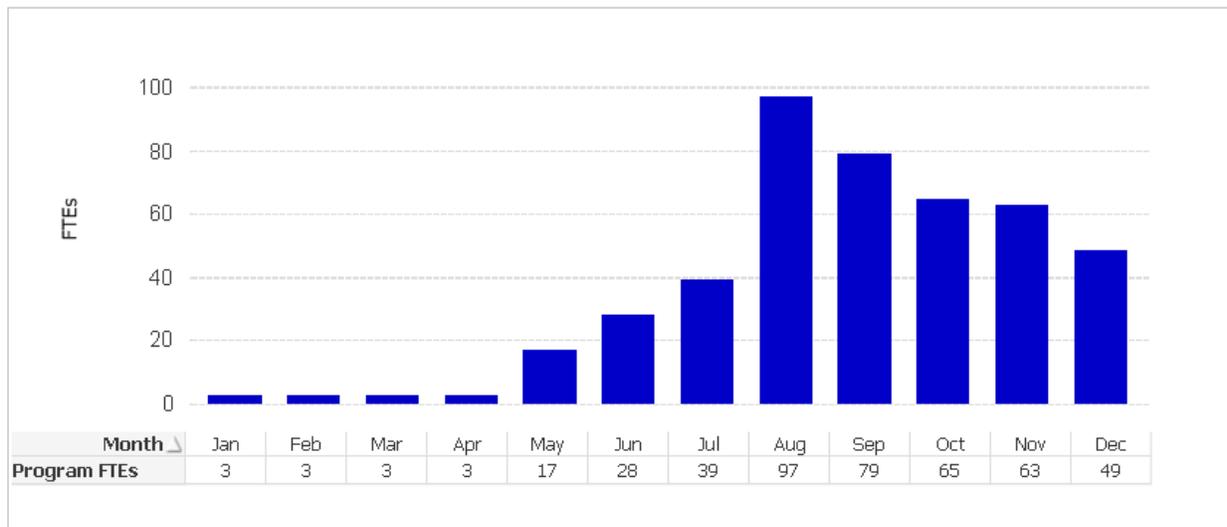
**FIGURE I.D.3: TRAINING FACILITIES 2014 CAPITAL BUDGET**



### I.D.4: 2014 Program FTEs

Figure I.D.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure I.D.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

**FIGURE I.D.4: TRAINING FACILITIES 2014 ASSIGNED FTEs**



## **SECTION I.E: Wood Pole Inspection, Treatment and Replacement**

### **I.E.1: 2014 Program Scope**

The 2014 Wood Pole Inspection, Treatment and Replacement program entails inspection and required treatment of an estimated 150,750 poles. Wood pole replacements and reinforcements generally lag inspections by one year. Based on ComEd's past inspection experience, 4,000 pole replacements or reinforcements are estimated to be identified from the inspections, including those conducted prior to 2014.

### **I.E.2: 2014 Program Schedule**

Figure I.E.2 presents the estimated 2014 schedule to complete the Wood Pole Inspection, Treatment and Replacement program. Estimates of cost, units of work, and schedules for that work may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2014 Plan, including the following tasks:

- Ramp-up period
- Establish work priority for the calendar year
- Perform inspections
- Perform scoping and configuration analysis for pole treatments or replacements
- Perform design tasks, procure material, and identify required outages in schedule
- Planning (develop work packages and secure permits)
- Construction – replace, treat or reinforce poles

- Liven circuits

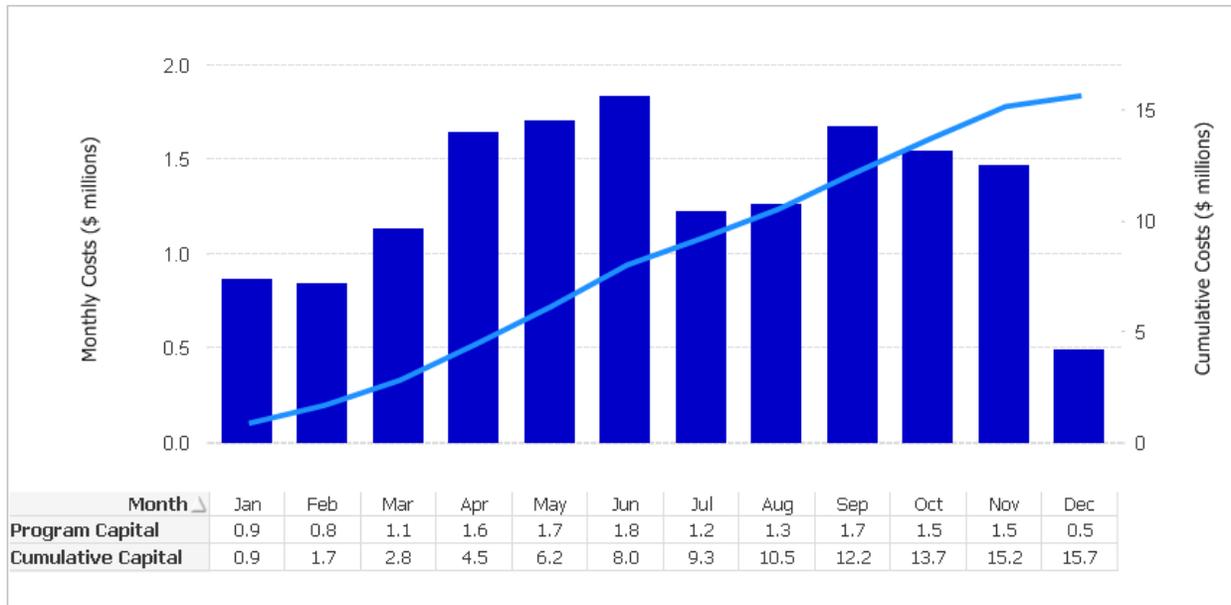
**FIGURE I.E.2: WOOD POLE INSPECTION, TREATMENT AND REPLACEMENT 2014 SCHEDULE**

Activity ID	Activity Name	Cul Days	Start	Finish	2014				2015				2016				2017	
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	
<b>CIIP - Wood Pole Inspection, Treatment, &amp; Replacement</b>																		
<b>Wood Pole Inspection, Treatment, &amp; Replacement</b>																		
WP2-13-3-0600	Construction - Replacement for 2014 - 1st Q	180	04-Jan-14	05-Jul-14														
WP2-13-4-0200	Inspect Poles for 2014 - 2nd Q	90	04-Jan-14	04-Apr-14														
WP2-13-4-0300	Scope for 2014 - 2nd Q	90	02-Feb-14	02-May-14														
WP2-13-4-0400	Construction - Reinforcing for 2014 - 2nd Q	180	02-Feb-14	02-Aug-14														
WP2-13-4-0500	Design / Procura / Planning - Replacement for 2014 - 2nd Q	90	04-Mar-14	02-Jun-14														
WP2-13-4-0600	Construction - Replacement for 2014 - 2nd Q	180	01-Apr-14	30-Sep-14														
WP3-14-1-0200	Inspect Poles for 2014 - 3rd Q	90	03-Apr-14	02-Jul-14														
WP3-14-1-0300	Scope for 2014 - 3rd Q	90	02-May-14	01-Aug-14														
WP3-14-1-0400	Construction - Reinforcing for 2014 - 3rd Q	180	02-May-14	31-Oct-14														
WP3-14-1-0500	Design / Procura / Planning - Replacement for 2014 - 3rd Q	90	03-Jun-14	02-Sep-14														
WP3-14-1-0600	Construction - Replacement for 2014 - 3rd Q	180	01-Jul-14	03-Jan-15														
WP3-14-2-0200	Inspect Poles for 2014 - 4th Q	90	03-Jul-14	02-Oct-14														
WP3-14-2-0300	Scope for 2014 - 4th Q	90	03-Aug-14	01-Nov-14														
WP3-14-2-0400	Construction - Reinforcing for 2014 - 4th Q	180	03-Aug-14	05-Feb-15														
WP3-14-2-0500	Design / Procura / Planning - Replacement for 2014 - 4th Q	90	03-Sep-14	03-Dec-14														
WP3-14-2-0600	Construction - Replacement for 2014 - 4th Q	180	03-Oct-14	06-Apr-15														
WP3-14-3-0200	Inspect Poles for 2015 - 1st Q	90	02-Oct-14	04-Jan-15														
WP3-14-3-0300	Scope for 2015 - 1st Q	90	02-Nov-14	05-Feb-15														
WP3-14-3-0400	Construction - Reinforcing for 2015 - 1st Q	180	02-Nov-14	06-May-15														
WP3-14-3-0500	Design / Procura / Planning - Replacement for 2015 - 1st Q	90	03-Dec-14	06-Mar-15														

### I.E.3: 2014 Program Budget

Figure I.E.3 presents the estimated 2014 capital budget for the Wood Pole Inspection, Treatment and Replacement program. ComEd estimates the 2014 program cost to be capital investments of \$16 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

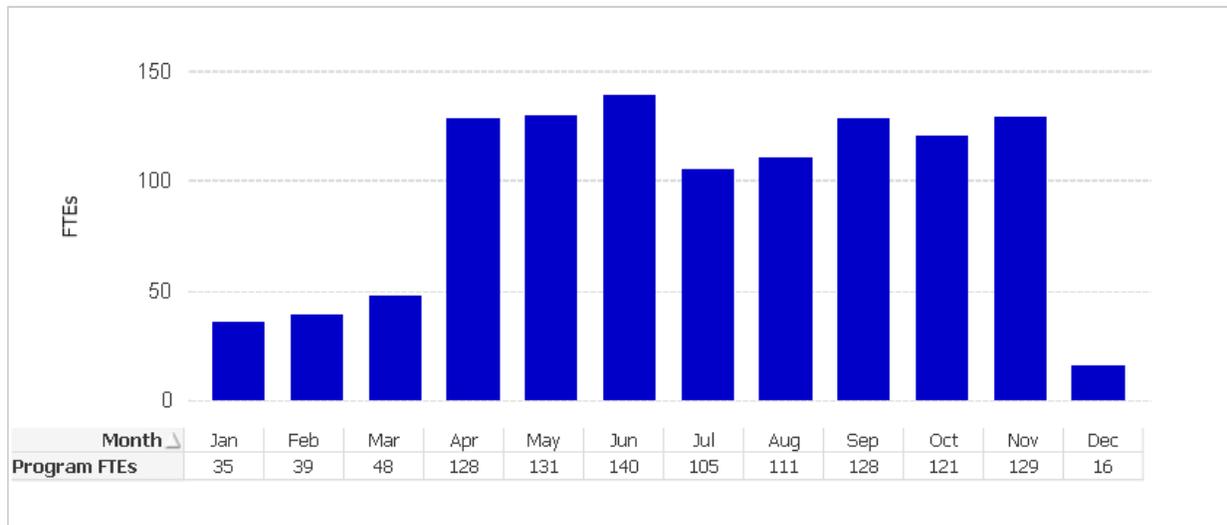
**FIGURE I.E.3: WOOD POLE INSPECTION, TREATMENT AND REPLACEMENT 2014 CAPITAL BUDGET**



#### I.E.4: 2014 Program FTEs

Figure I.E.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure I.E.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

**FIGURE I.E.4: WOOD POLE INSPECTION, TREATMENT AND REPLACEMENT 2014 ASSIGNED FTEs**

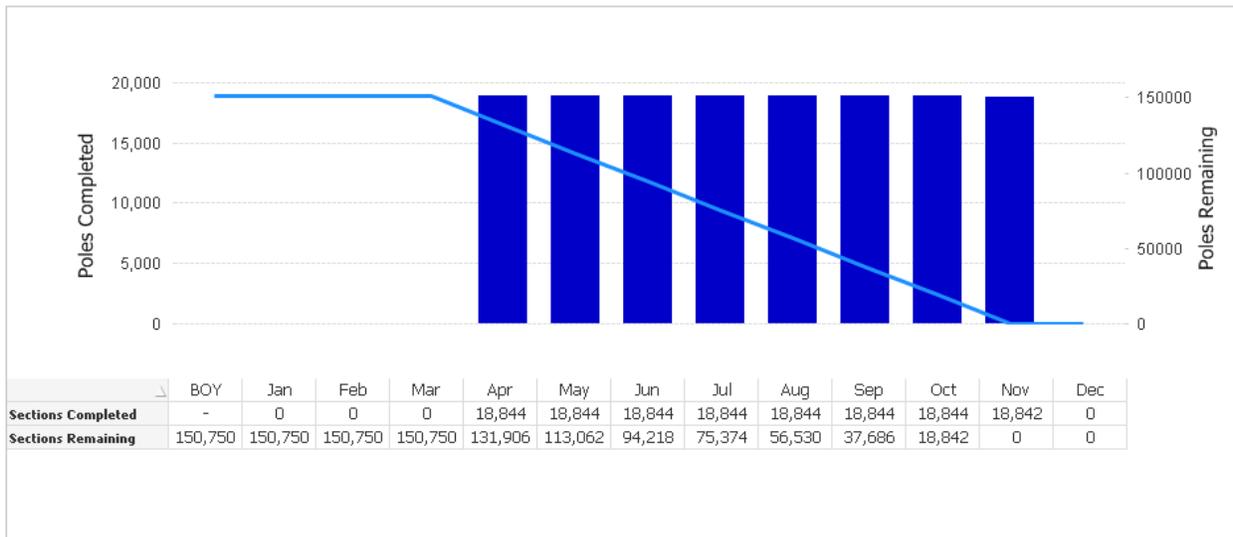


## I.E.5: 2014 Program Units

### Wood Pole Inspection

Figure I.E.5.A shows the estimated quantity of wood poles to be inspected in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. It is estimated that 150,750 wood poles will be inspected in 2014. Estimates of cost, units of work, and schedules for that work may evolve over time.

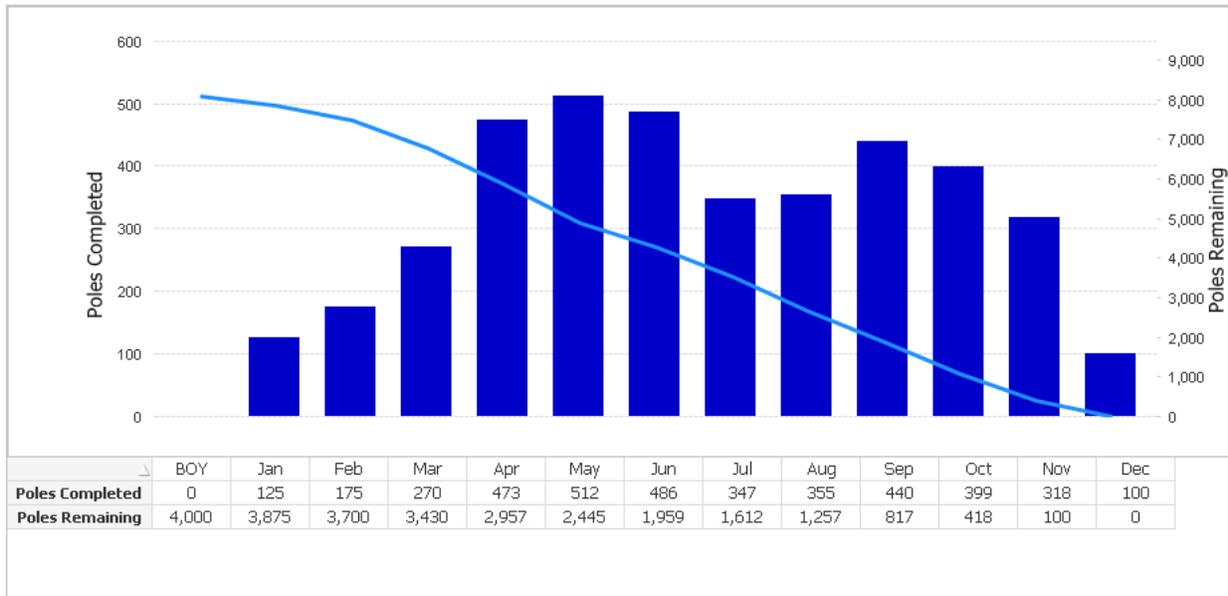
**FIGURE I.E.5.A: WOOD POLE INSPECTION UNITS (IN POLES)**



Wood Pole Replacement/Reinforcement

Figure I.E.5.B shows the estimated quantity of wood poles to be replaced/reinforced in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. It is estimated that 4,000 wood poles will be replaced/reinforced in 2014. Estimates of cost, units of work, and schedules for that work may evolve over time. This estimate is based on assumptions concerning inspection results, which will be adjusted over time as actual data become available. Estimates of wood pole replacement/reinforcements contain a high degree of uncertainty and are not intended to reflect firm scope.

**FIGURE I.E.5.B: WOOD POLE REPLACEMENT/REINFORCEMENT UNITS (IN POLES)**



## **SECTION I.F: Storm Hardening**

### **I.F.1: 2014 Program Scope**

Storm hardening is designed to further reduce the susceptibility of certain circuits to storm-related damage, including but not limited to high winds, thunderstorms, and ice storms. Improvements may include, but are not limited to, overhead to underground conversion, installation of tree-resistant cable, additional vegetation management and other engineered solutions. This program is aimed at hardening facilities in accordance with the directives of Section 16-108.5(b)(1)(A)(iv) of the Act, and is not directed at any defect or failure to properly design, engineer, construct, or maintain the existing system. Additionally, while storm hardening is designed to further reduce the susceptibility of circuits to storm-related damage, it does not make circuits immune to damage from storms or other sources.

Circuits will be prioritized based on each circuit's historical susceptibility to storm-related damage and the ability to provide the greatest customer benefit upon completion of the improvement.

For a circuit to be eligible for improvement, ComEd's ability to maintain proper tree clearances surrounding the overhead circuit must not have been impeded by third parties.

Considerations for storm hardening of circuits include, but are not limited to:

- Mainline Circuits (Focus on circuits with the highest customer storm impact)
- 4 kV and 12kV overhead circuits

- Prioritized by weighted reliability (SAIFI, Customers Served) and vegetation scores from 2008 to 2013
- Circuits with fewer than 500 customers
- Engineering review for determining targeted mainline portions and hardening solution
- Circuit Taps (Focus on circuits with pocket area storm duration impact)
- 4kV and 12kV overhead circuits
- Prioritized by weighted reliability (SAIFI, customer Interruptions) and vegetation scores from 2008 to 2013
- Circuit tap must meet vegetation outage and CAIDI gates
- Engineering review for determining tap portions and hardening solutions (e.g., URD, spacer cable, and enhanced trimming)

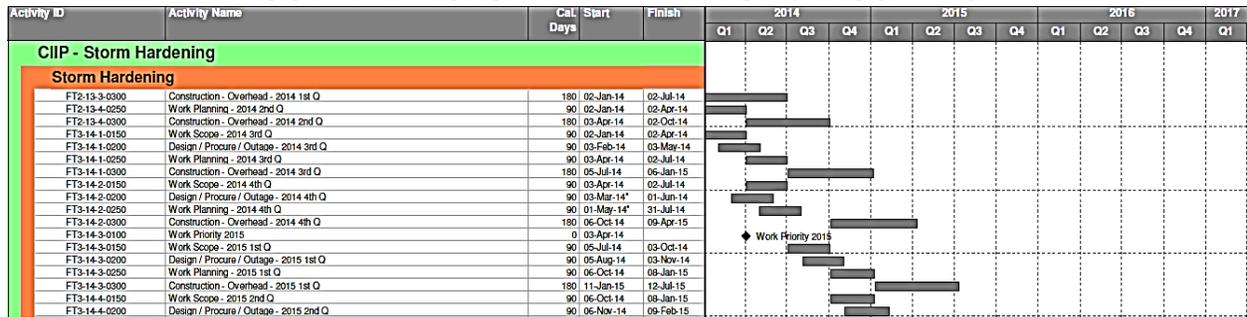
The 2014 scope for this program will consist of prioritizing circuits and identification of appropriate hardening solutions for each, and addressing 2014 priority circuits.

#### **I.F.2: 2014 Program Schedule**

Figure I.F.2 presents the estimated schedule to complete the Storm Hardening program. Estimates of cost, units of work, and schedules for that work may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2014 Plan, including the following key tasks:

- Perform design tasks, procure material, and identify required outages in schedule
- Work planning
- Construction

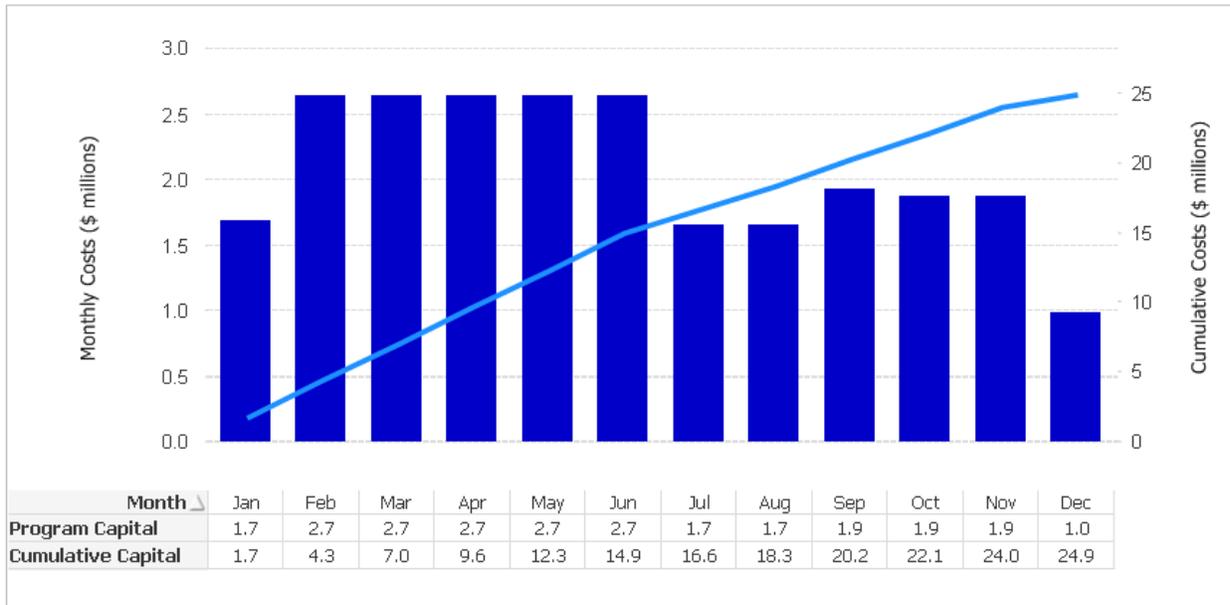
**FIGURE I.F.2: STORM HARDENING 2014 SCHEDULE**



### I.F.3: 2014 Program Budget

Figure I.F.3 presents the estimated 2014 capital budget for the Storm Hardening program. ComEd estimates the 2014 program cost to be capital investments of \$25 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

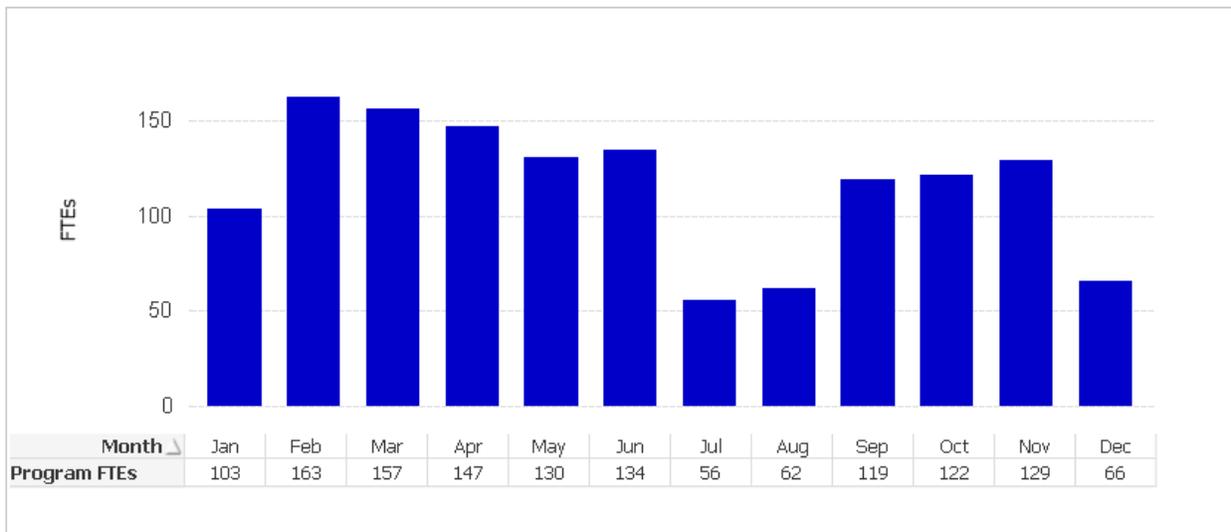
**FIGURE I.F.3: STORM HARDENING 2014 CAPITAL BUDGET**



#### I.F.4: 2014 Program FTEs

Figure I.F.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure I.F.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

**FIGURE I.F.4: STORM HARDENING 2014 ASSIGNED FTEs**



## **SECTION II: Smart Grid-Related Investments**

### **SECTION II.A: Distribution Automation**

#### **II.A.1: 2014 Program Scope**

Distribution Automation (“DA”) technology uses “sectionalizing” devices and remote communications to detect issues on the distribution system and automatically re-route power, accordingly, to minimize the number of customers impacted. This is commonly referred to as the self-healing nature of the Smart Grid.

The ComEd DA technologies include:

- Field sectionalizing devices to detect and isolate faults at various segments of the distribution system;
- A radio system to remotely transmit and relay control functions and indicate the status of various system parameters; and
- The computer systems that control, operate, monitor and store the data for the DA system.

The DA program targets installing DA field devices, and also encompasses the replacement of the older 900 megahertz (“MHZ”) radio system with a new higher security system that meets newly-established government regulations. In addition, the older 34kV field devices will be upgraded to the newer Intelli-team (“IT-2”) software to allow for better flexibility with fault isolation and operation with the new radio system.

The DA program includes the planned installation of an estimated 638 new DA devices in 2014.

## **II.A.2: 2014 Program Schedule**

Figure II.A.2 presents the estimated schedule to complete the DA 2014 scope. Estimates of cost, units of work, and schedules for that work, may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2014 Plan, including the following key tasks:

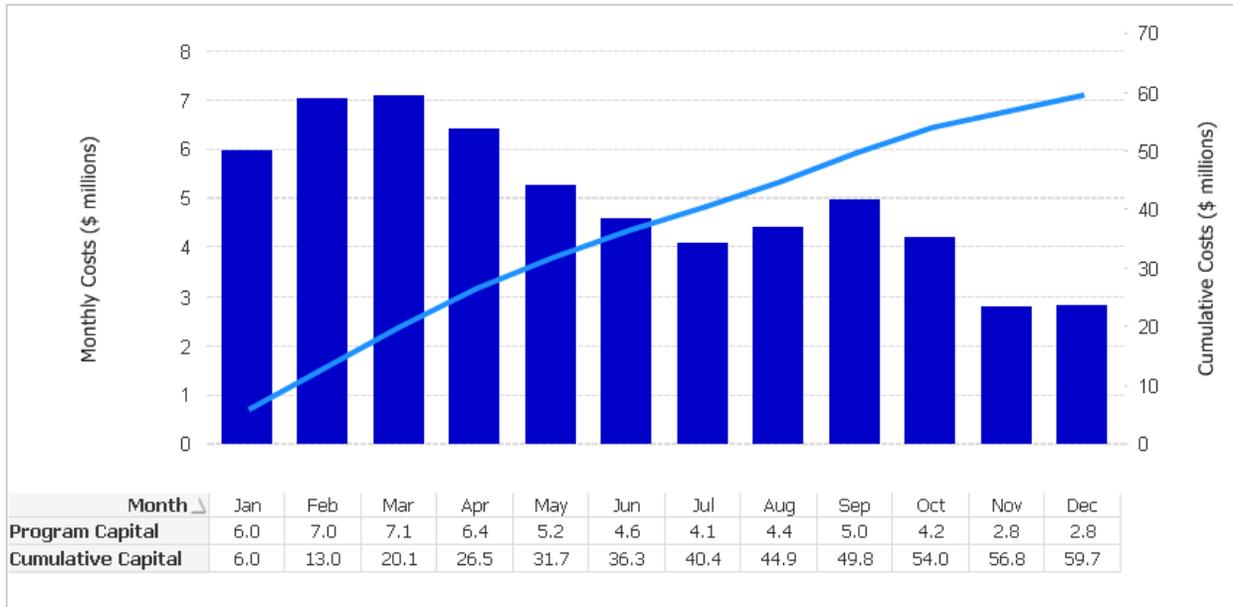
- Ramp-up period
- Establish priority for the calendar year
- Perform scoping
- Perform design tasks, procure material, and identify required outages in schedule
- Planning (develop work packages and secure permits)
- Construction – install reclosers
- Construction – install radios, repeaters
- Test and liven



### II.A.3: 2014 Program Budget

Figure II.A.3 presents the estimated 2014 capital budget for the DA program. ComEd estimates the program cost to be capital investments of \$60 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

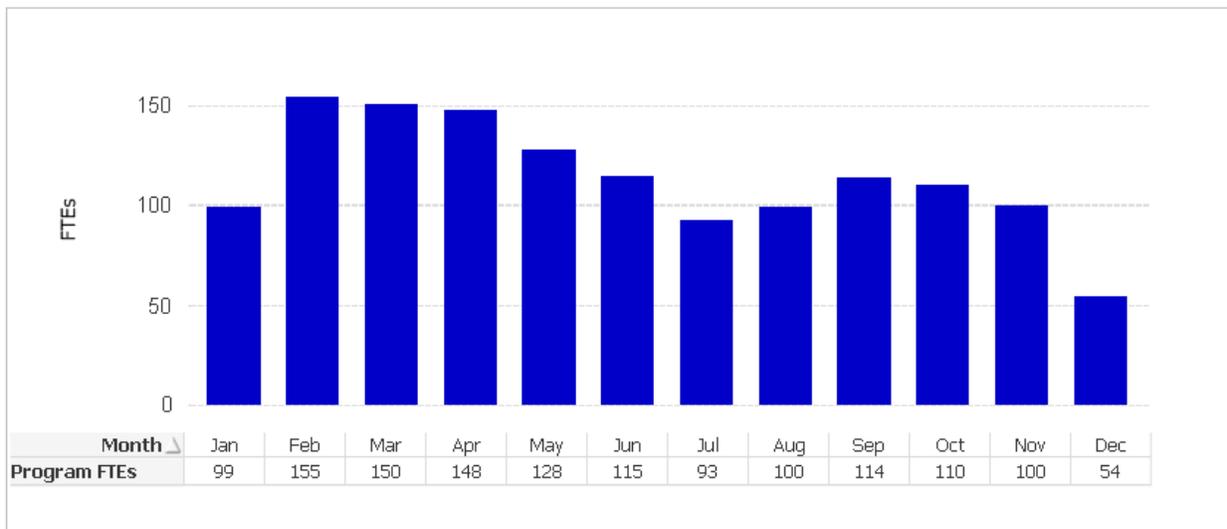
**FIGURE II.A.3: DISTRIBUTION AUTOMATION 2014 CAPITAL BUDGET**



## II.A.4: 2014 Program FTEs

Figure II.A.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure II.A.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

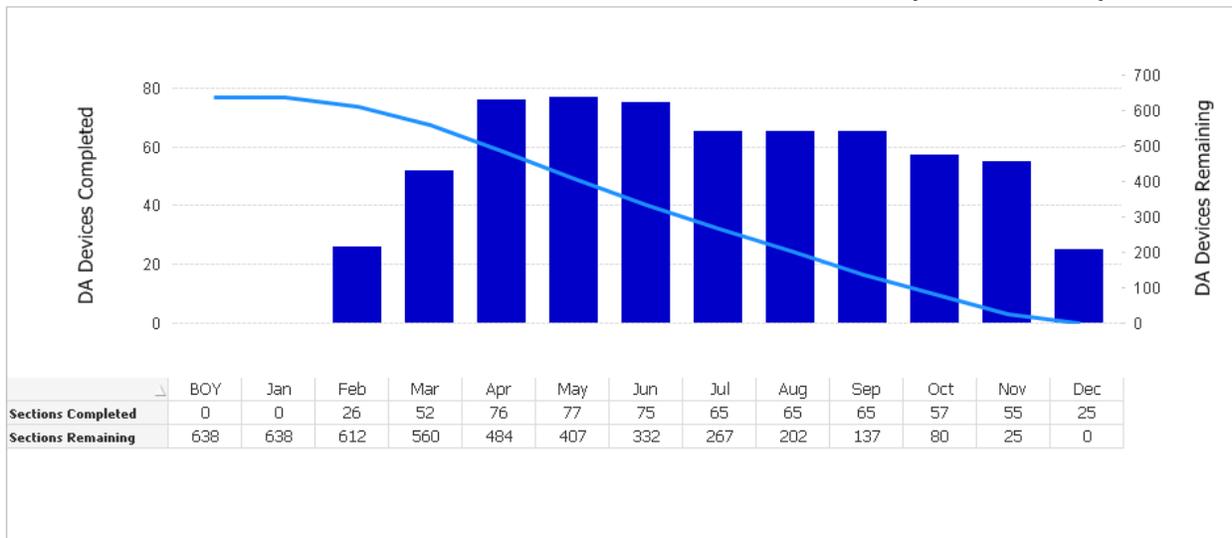
**FIGURE II.A.4: DISTRIBUTION AUTOMATION 2014 ASSIGNED FTEs**



## II.A.5: 2014 Program Units

Figure II.A.5 presents the estimated quantity of DA devices to be installed in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished during 2014. It is estimated that 638 DA devices will be installed in 2014. Estimates of cost, units of work, and schedules for that work may evolve over time.

**FIGURE II.A.5 DISTRIBUTION AUTOMATION UNITS (IN DEVICES)**



## **SECTION II.B: Substation Micro-Processor Relay Upgrades**

### **II.B.1: 2014 Program Scope**

This program is planned to modernize ten ComEd substations, including upgrade of electro-mechanical protective relays to modern microprocessor-based devices, replacement of aging circuit breakers, enabling two-way communications between ComEd's control center and each substation, and installation of technology to remotely monitor the health of ComEd's largest assets, its transformers. This program provides for fault detection, remote asset monitoring, improved site security, and dynamic voltage regulation. Partial upgrades may be applied across the service territory. ComEd has over 250 transmission-fed substations, and over 800 substations in total.

The 2014 scope of work for this program includes upgrade of ComEd's Sawyer and Tonne substations, and initial design and engineering for an additional two substations that are planned for upgrade in 2015.

### **II.B.2: 2014 Program Schedule**

Figure II.B.2 presents the estimated schedule to complete the 2014 Substation Micro-Processor Relay Upgrades scope of work. Estimates of cost, units of work, and schedules for that work may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2014 Plan, including the following key tasks:

- Develop work scope
- Design and engineer
- Procure long lead materials
- Identify and request required outages in schedule

- Review and issue construction drawings
- Mobilization
- Construction
- Develop dashboard

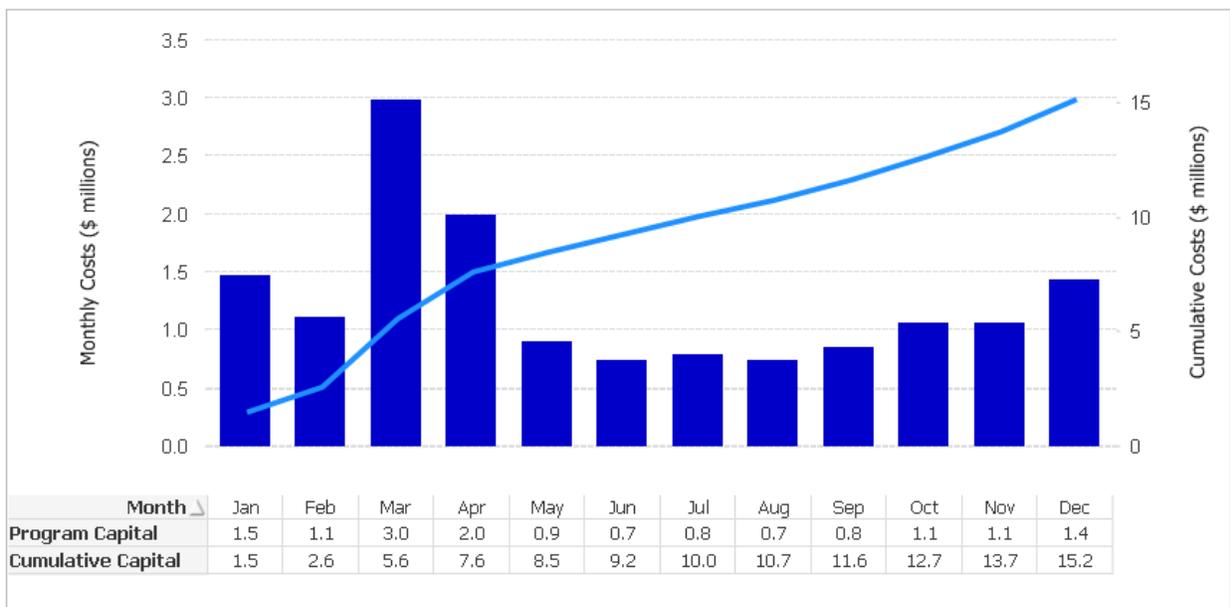
**FIGURE II.B.2: SUBSTATION MICRO-PROCESSOR RELAY UPGRADE 2014 SCHEDULE**

Activity ID	Activity Name	Cal. Days	Start	Finish	2014				2015				2016				2017			
					Q1	Q2	Q3	Q4												
<b>CIIP - Substation Micro-Processor Relay Upgrades</b>																				
IS1-12-1-2030	Review & Issue Construction Dwgs - Intel. Sub. #4 & 5	60	16-Jan-14 A	17-Mar-14																
IS1-12-1-2040	Identify & Request Work Outages - Intel. Sub. #4 & 5	270	20-Nov-13 A	24-Aug-14																
IS1-12-1-2060	Construction - Intel. Sub. #4 & 5	365	02-Jan-14 A	30-Dec-14																
IS1-12-1-2070	Develop Dashboard - Intel. Sub. #4 & 5	230	09-May-14	30-Dec-14																
IS1-12-1-2080	DeMobilize - Intel. Sub. #4 & 5	5	31-Dec-14	05-Jan-15																
IS1-15-1-2000	Develop Scope - Intel. Sub. #6 & 7	88	02-Jan-14 A	31-Mar-14																
IS1-15-1-2010	Design & Engineering - Intel. Sub. #6 & 7	150	02-Mar-14	31-Jul-14																
IS1-15-1-2020	Procure Long Lead Materials - Intel. Sub. #6 & 7	180	21-May-14	19-Nov-14																
IS1-15-1-2030	Review & Issue Construction Dwgs - Intel. Sub. #6 & 7	60	21-May-14*	21-Jul-14																
IS1-15-1-2040	Identify & Request Work Outages - Intel. Sub. #6 & 7	270	20-Nov-14	24-Aug-15																
IS1-15-1-2050	Mobilize - Intel. Sub. #6 & 7	5	27-Dec-14	31-Dec-14																

### II.B.3: 2014 Program Budget

Figure II.B.3 presents the estimated 2014 capital budget for the Substation Micro-Processor Relay Upgrade program. ComEd estimates the 2014 program cost to be capital investments of \$15 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

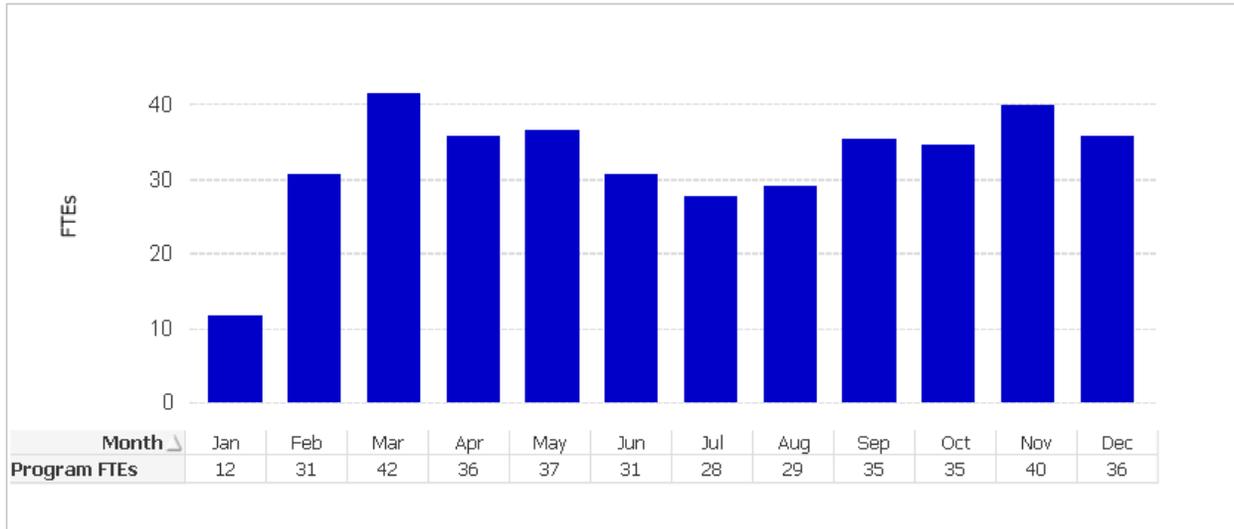
**FIGURE II.B.3: SUBSTATION MICRO-PROCESSOR RELAY UPGRADE 2014 CAPITAL BUDGET**



## II.B.4: 2014 Program FTEs

Figure II.B.4 presents the estimated Assigned Direct and Assigned Contractor FTEs required to perform the specific scheduled 2014 scope of work. Assigned FTEs have been calculated by taking the estimated worker-hours assigned to execute the scope of work and dividing by 2,080 hours. The estimated FTEs presented in Figure II.B.4 include Assigned FTEs; however, they do not include Support FTEs or Induced FTEs.

**FIGURE II.B.4: SUBSTATION MICRO-PROCESSOR RELAY UPGRADE 2014  
ASSIGNED FTEs**



## **SECTION II.C: Smart Meters**

Deployment of Smart Meters will occur pursuant to the Advanced Metering Infrastructure Deployment Plan (“AMI Plan”) approved by the Commission in Docket No. 12-0298 and further modified in Docket No. 13-0285.<sup>3</sup> Please refer to the 2014 AMI Annual Implementation Progress Report for specific details, which are incorporated into this 2014 Plan by reference.

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<sup>3</sup> Please note, however, that on March 13, 2014, ComEd filed a Verified Petition for Expedited Approval of Acceleration of Meter Deployment under ComEd’s AMI Plan (“Petition”), which proposes to complete Smart Meter deployment three years earlier than the timeline set forth in the current AMI Plan. ComEd’s Petition is pending in ICC Docket No. 14-0212.

## **Appendix A: Summary-Level Plan Information**

As required by Section 16-108(b), the total estimated \$366 million of capital investment under the 2014 Plan will be incremental to ComEd's total annual capital investment program, as defined in Section 16-108.5(b). That is, over the course of 2014, ComEd will invest an estimated total of \$366 million more capital than a capital investment program that invested at an annual rate defined by ComEd's average capital spend for calendar years 2008, 2009, and 2010, as reported in ComEd's applicable Federal Energy Regulatory Commission ("FERC") Form 1s.

Table A.1 presents a summary of the 2014 Plan's estimated total capital budget by program, and Figure A.2 presents the estimated total capital budget by month associated with the 2014 Plan.

**TABLE A.1: 2014 PLAN CAPITAL COSTS BY PROGRAM**

<b>Program</b>	<b>Total Capital (\$M)</b>
<i>URD Injection and Replacement Program</i>	\$79
<i>Mainline Cable System Refurbishment and Replacement Program</i>	\$72
<i>Ridgeland 69kV Cable Program</i>	\$10
<i>Training Facilities Program</i>	\$5
<i>Wood Pole Program</i>	\$16
<i>Storm Hardening Program</i>	\$25
<b>Total Reliability-Related Investments</b>	<b>\$207</b>
<i>Distribution Automation Program</i>	\$60
<i>Substation Micro-Processor Relay Upgrade Program</i>	\$15
<i>Smart Meter Program</i>	\$84
<b>Total Smart Grid Related Investments</b>	<b>\$159</b>
<b>Total Plan Investments</b>	<b>\$366</b>

**FIGURE A.2: 2014 PLAN CAPITAL ESTIMATE BY MONTH**

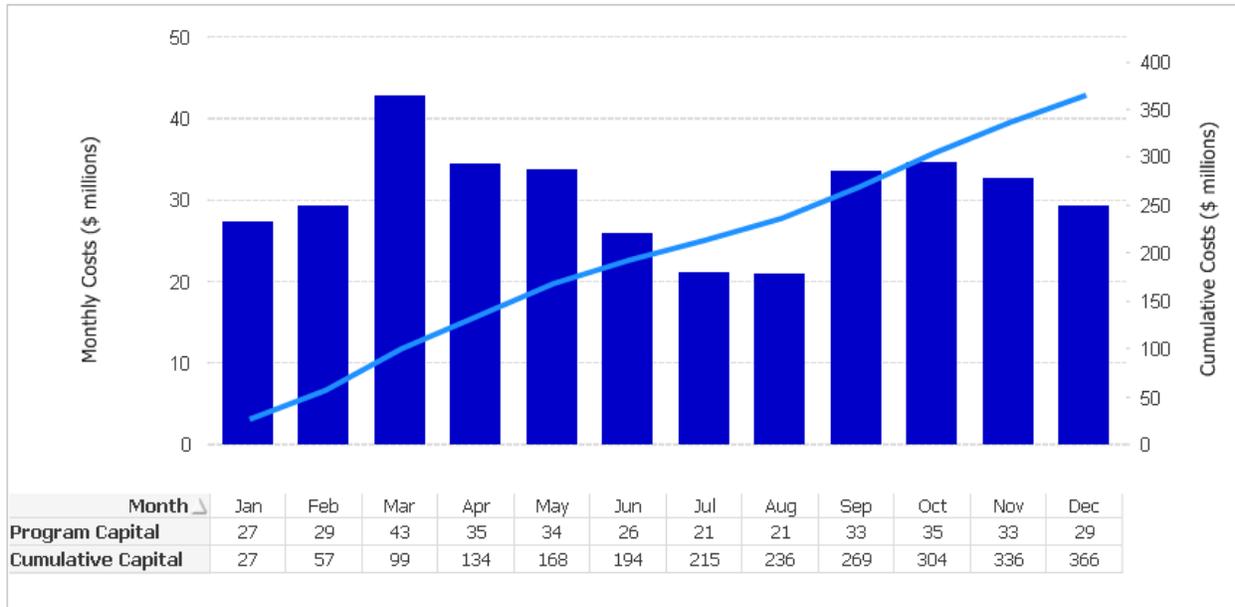


Figure A.3 presents the estimated Assigned FTEs and Support FTEs to execute the entire scheduled scope of work associated with the 2014 Plan. Estimates for Support FTEs in the 2014 Plan are based on the 2014 actual proportion of Assigned FTEs to Support FTEs. The estimated FTEs presented in this 2014 Plan include Direct jobs and Contractor positions; however, they do not include any Induced FTEs.

**FIGURE A.3: 2014 ESTIMATED ASSIGNED AND SUPPORT FTEs**

