SECTION I.D: Construction of Training Facilities

I.D.1: 2012 Program Scope

ComEd currently provides electric and customer operations training at five locations within its service territory, with one location being leased and two locations using temporary trailers. Under Section 16-108.5(b)(1)(A)(ii), ComEd must undertake training facility construction or upgrade projects totaling an estimated $10,000,000. This Section further 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 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). 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.

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, instructor office space, restroom and locker facilities, indoor equipment area, new technology area, storage, conference room, student break area, food area (microwaves/refrigerators), 20 indoor underground cable splicing bays, and an indoor pole yard.
- Outdoor yard area consisting of approximately 40 poles and associated overhead primary and secondary conductors, overhead equipment, distribution automation equipment, URD distribution equipment, underground manholes and conduit, and substation equipment. The estimated yard size is 400' x 600'.

Rockford Facility

The Rockford facility will be an overhead construction training facility planned to have the following characteristics:

- Indoor area consisting of classrooms, instructor office space, restroom & locker facilities, storage, conference room, student break area, and a food area (microwaves/refrigerators).
- Outdoor yard area consisting of approximately 40 poles and associated overhead primary and secondary conductors, overhead equipment, distribution automation equipment, and URD distribution equipment. The estimated yard size is 200' x 300'.

The 2012 scope for this program includes planning, ground-breaking and construction for the Rockford Facility, and initial planning and design for the Chicago Facility.

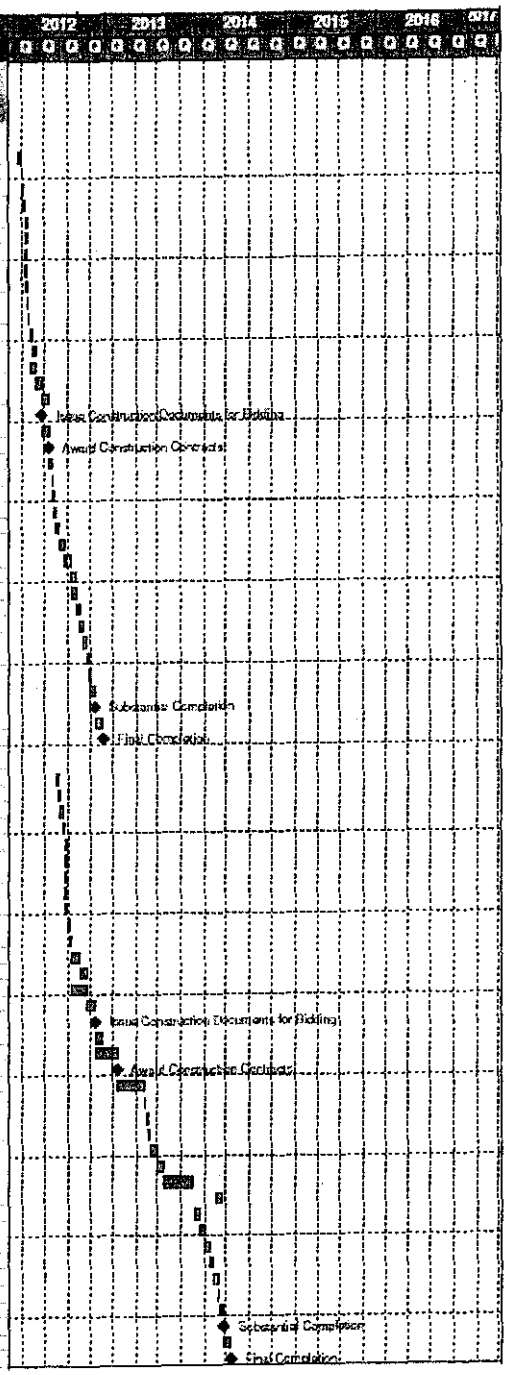
I.D.2: 2012 Program Schedule

Figure I.D.2 presents the estimated schedule to complete the Training Facilities program. The Training Facilities program is planned to be completed over a three-year period. Estimates of cost, and units of work, and schedules for that work, may evolve over time. Given the relatively short duration of this program, the entire program schedule is shown here. The schedule consists of the following key 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
- Demobilization

FIGURE I.D.2: TRAINING FACILITIES SCHEDULE

Activity ID	Activity Name	Cal. Days	Start	Finish
	ComEd Infrastructure Investment Plan	592	20-Jan-12	23-May-14
	Training Facilities	[illegible]	[illegible]	[illegible]
	Rockford Training Facility	235	20-Jan-12	20-Dec-12
FR-12-0010	Confirmation of project use and building square footage s...	10	20-Jan-12	29-Jan-12
FR-12-0020	Confirmation of site needs and area	5	30-Jan-12	03-Feb-12
FR-12-0030	Property search (size based on building or site needs det...	5	04-Feb-12	08-Feb-12
FR-12-0040	Initial property selection	5	09-Feb-12	13-Feb-12
FR-12-0110	Zoning analysis	5	14-Feb-12	18-Feb-12
FR-12-0120	Geotechnical investigation	5	14-Feb-12	18-Feb-12
FR-12-0130	Survey & site commitment analysis	5	14-Feb-12	18-Feb-12
FR-12-0140	Easement and encumbrance analysis	5	14-Feb-12	18-Feb-12
FR-12-0150	Site concept plan evaluation	5	14-Feb-12	18-Feb-12
FR-12-0160	Property procurement & closing (based on favorable due ...	5	15-Feb-12	22-Feb-12
FR-12-0210	Design Contracting	5	24-Feb-12	28-Feb-12
FR-12-0320	Schematic Design: Cost Estimate	15	29-Feb-12	14-Mar-12
FR-12-0330	Schematic Design: Preliminary meetings with City & othe...	15	15-Mar-12	29-Mar-12
FR-12-0340	Design Development: Design Development Cost Estimate	29	29-Feb-12	28-Mar-12
FR-12-0350	Construction Documents	21	30-Mar-12	19-Apr-12
FR-12-0360	Submit for Building Permit	30	20-Apr-12	19-May-12
FR-12-0370	Issue Construction Documents for Bidding	0		20-Apr-12
FR-12-0380	Bidding & scope reviews	30	20-Apr-12	19-May-12
FR-12-0385	Award Construction Contracts	0		19-May-12
FR-12-0390	Contractor submittals and reviews by design professional	15	20-May-12	04-Jun-12
FR-12-0410	Mobilization	2	03-Jun-12	04-Jun-12
FR-12-0420	Property clearing and grubbing	5	05-Jun-12	09-Jun-12
FR-12-0430	Site work and mass grading	10	10-Jun-12	19-Jun-12
FR-12-0440	Site Utilities	11	20-Jun-12	03-Jul-12
FR-12-0450	Foundation excavation, forming, pouring and backfill	18	03-Jul-12	31-Jul-12
FR-12-0460	Building structure erection	31	20-Jul-12	19-Aug-12
FR-12-0465	Site Work (Paving etc...)	20	20-Aug-12	05-Sep-12
FR-12-0470	Building exterior enclosure	16	20-Aug-12	05-Sep-12
FR-12-0480	Mechanical, Electrical, Plumbing & Fire Protection (MEP	15	06-Sep-12	20-Sep-12
FR-12-0490	Interior framing	15	21-Sep-12	05-Oct-12
FR-12-0500	Interior finishes	10	06-Oct-12	15-Oct-12
FR-12-0510	MEP Trim	10	16-Oct-12	25-Oct-12
FR-12-0520	Systems start up and testing	10	26-Oct-12	04-Nov-12
FR-12-0530	Equipment & Technology Installation	15	05-Nov-12	19-Nov-12
FR-12-0540	Substantial Completion	0		19-Nov-12
FR-12-0550	Punch list & walk through	29	20-Nov-12	20-Dec-12
FR-12-0556	Final Completion	0		20-Dec-12
	Chicago Training Facility	485	20-Jun-12	22-May-14
FR-12-1010	Confirmation of project use and building square footage s...	5	20-Jun-12	24-Jun-12
FR-12-1020	Confirmation of site needs and area	5	25-Jun-12	29-Jun-12
FR-12-1030	Property search (size based on building or site needs det...	10	30-Jun-12	10-Jul-12
FR-12-1040	Initial property selection	10	11-Jul-12	20-Jul-12
FR-12-1110	Zoning analysis	10	21-Jul-12	30-Jul-12
FR-12-1120	Geotechnical investigation	10	21-Jul-12	30-Jul-12
FR-12-1130	Survey & site commitment analysis	10	21-Jul-12	30-Jul-12
FR-12-1140	Easement and encumbrance analysis	10	21-Jul-12	30-Jul-12
FR-12-1150	Site concept plan evaluation	10	21-Jul-12	30-Jul-12
FR-12-1160	Property procurement & closing (based on favorable due ...	10	31-Jul-12	09-Aug-12
FR-12-1210	Design Contracting	10	10-Aug-12	19-Aug-12
FR-12-1320	Schematic Design: Cost Estimate	30	20-Aug-12	19-Sep-12
FR-12-1330	Schematic Design: Preliminary meetings with City & othe...	30	20-Sep-12	19-Oct-12
FR-12-1340	Design Development: Design Development Cost Estimate	60	20-Aug-12	18-Oct-12
FR-12-1350	Construction Documents	32	20-Oct-12	20-Nov-12
FR-12-1360	Issue Construction Documents for Bidding	0		20-Nov-12
FR-12-1370	Submit for Building Permit	30	20-Nov-12	21-Dec-12
FR-12-1380	Bidding & scope reviews	65	21-Nov-12	20-Feb-13
FR-12-1385	Award Construction Contracts	0		20-Feb-13
FR-12-1390	Contractor submittals and reviews by design professional	110	21-Feb-13	11-Jun-13
FR-12-1410	Mobilization	1	12-Jun-13	12-Jun-13
FR-12-1420	Property clearing and grubbing	7	13-Jun-13	19-Jun-13
FR-12-1430	Site work and mass grading	10	20-Jun-13	25-Jun-13
FR-12-1440	Site Utilities	26	26-Jun-13	26-Jul-13
FR-12-1450	Foundation excavation, forming, pouring and backfill	27	26-Jul-13	21-Aug-13
FR-12-1460	Building structure erection	120	26-Aug-13	26-Dec-13
FR-12-1465	Site Work (Paving etc...)	20	23-Mar-14	10-Apr-14
FR-12-1470	Building exterior enclosure	20	31-Dec-13	13-Jan-14
FR-12-1480	Mechanical, Electrical, Plumbing & Fire Protection (MEP	20	13-Jan-14	03-Feb-14
FR-12-1490	Interior framing	20	03-Feb-14	22-Feb-14
FR-12-1500	Interior finishes	15	23-Feb-14	06-Mar-14
FR-12-1510	MEP Trim	15	10-Mar-14	24-Mar-14
FR-12-1520	Systems start up and testing	10	25-Mar-14	03-Apr-14
FR-12-1530	Equipment & Technology Installation	18	04-Apr-14	21-Apr-14
FR-12-1540	Substantial Completion	0		21-Apr-14
FR-12-1550	Punch list & walk through	31	22-Apr-14	23-May-14
FR-12-1556	Final Completion	0		23-May-14

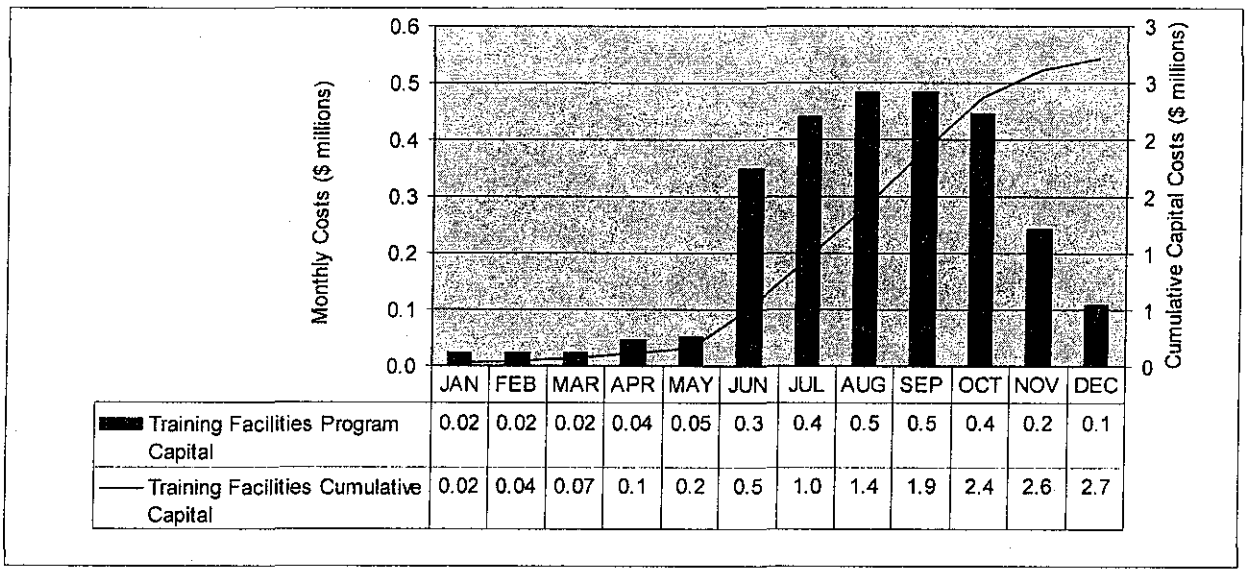


I.D.3: 2012 Program Budget

Pursuant to Section 16-108.5(b) of the Act, ComEd will invest in training facility construction or upgrade projects totaling an estimated $2.7 million under the 2012 Plan.

Figure I.D.3 presents the estimated 2012 budget for the Training Facilities program to be accounted for under the 2012 Plan.[1]

FIGURE I.D.3: TRAINING FACILITIES 2012 CAPITAL BUDGET UNDER PLAN



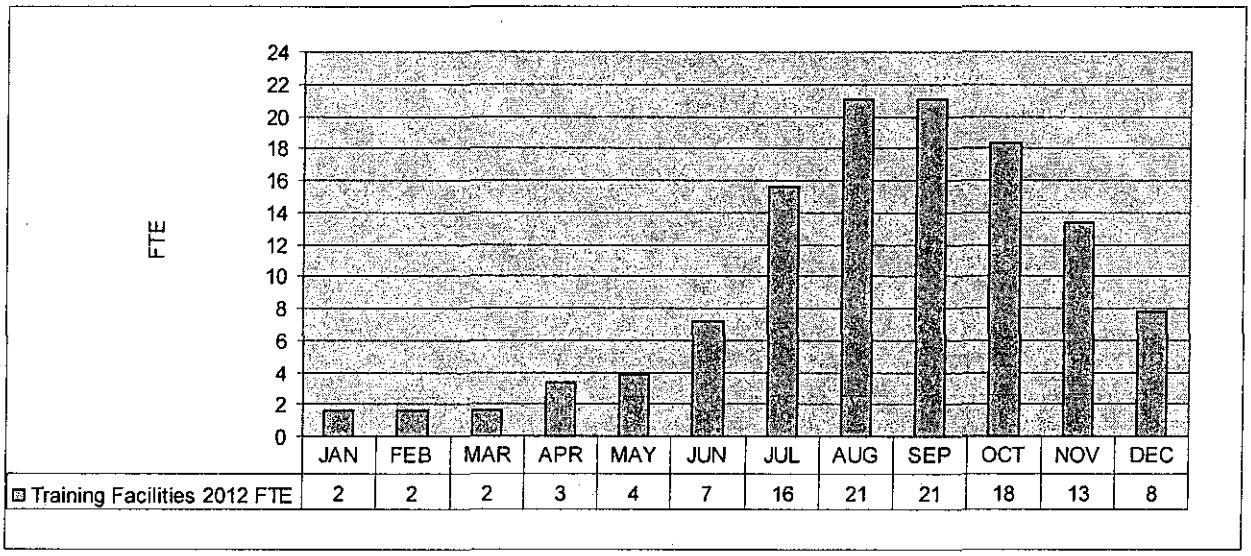
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Training Facilities Program Capital	0.02	0.02	0.02	0.04	0.05	0.3	0.4	0.5	0.5	0.4	0.2	0.1
Training Facilities Cumulative Capital	0.02	0.04	0.07	0.1	0.2	0.5	1.0	1.4	1.9	2.4	2.6	2.7

[1] Although the 2012 Plan includes capital investments of $2.7 million in Training Facilities, plus associated expenses, pursuant to Section 16-108.5(b) of the Act, this does not limit ComEd's ability to make additional capital investments in Training Facilities through baseline capital investments at ComEd's discretion.

I.D.4: 2012 Program FTEs

Figure I.D.4 presents the estimated FTEs to perform the scheduled 2012 scope of work for the Training Facilities program. FTEs have been calculated by taking the estimated worker-hours to execute the scope of work and dividing by 2,080. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support and craft.

FIGURE I.D.4: TRAINING FACILITIES 2012 FTES



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Training Facilities 2012 FTE	2	2	2	3	4	7	16	21	21	18	13	8

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

I.E.1: 2012 Program Scope

The 2012 Wood Pole Inspection, Treatment and Replacement program entails inspection and required treatment of an estimated 133,400 poles. Based on ComEd's past inspection experience, about 2,500 pole replacements or reinforcements are estimated to be identified from the inspections in 2012.

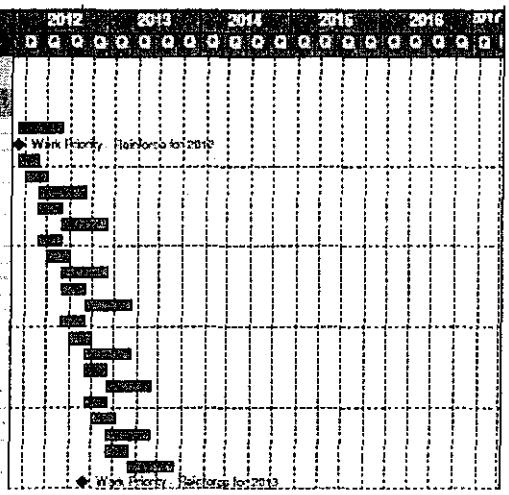
I.E.2: 2012 Program Schedule

Figure I.E.2 presents the estimated 2012 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 2012 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 2012 SCHEDULE

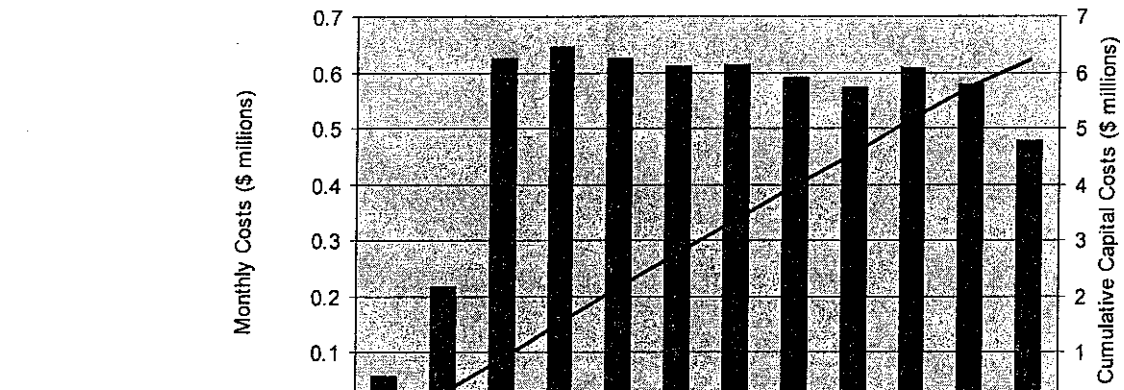
Activity ID	Activity Name	Cal. Days	Start	Finish
	ComEd Infrastructure Investment Plan	1233	01-Jan-12	30-Oct-16
	Wood Pole Inspection, Treatment, & Replace...			
WP1-12-1-0001	Mobilization Ramp Up	180	01-Jan-12*	01-Jul-12
WP1-12-1-0100	Work Priority - Reinforce for 2012	0	01-Jan-12*	
WP1-12-1-0200	Inspect Poles for 2012 - 3rd Q	90	01-Jan-12	01-Apr-12
WP1-12-1-0300	Scope for 2012 - 3rd Q	90	01-Feb-12	30-Apr-12
WP1-12-1-0400	Construction - Reinforcing for 2012 - 3rd Q	180	01-Apr-12	30-Sep-12
WP1-12-1-0500	Design / Procure / Planning - Replacement for 2012 - 3rd Q	90	01-Apr-12	30-Jun-12
WP1-12-1-0600	Construction - Replacement for 2012 - 3rd Q	180	01-Jul-12	03-Jan-13
WP1-12-2-0200	Inspect Poles for 2012 - 4th Q	90	01-Apr-12	30-Jun-12
WP1-12-2-0300	Scope for 2012 - 4th Q	90	01-May-12	31-Jul-12
WP1-12-2-0400	Construction - Reinforcing for 2012 - 4th Q	180	01-Jul-12	03-Jan-13
WP1-12-2-0500	Design / Procure / Planning - Replacement for 2012 - 4th Q	90	01-Jul-12	30-Sep-12
WP1-12-2-0600	Construction - Replacement for 2012 - 4th Q	180	01-Oct-12	04-Apr-13
WP1-12-3-0200	Inspect Poles for 2013 - 1st Q	90	01-Jul-12	30-Sep-12
WP1-12-3-0300	Scope for 2013 - 1st Q	90	01-Aug-12	30-Oct-12
WP1-12-3-0400	Construction - Reinforcing for 2013 - 1st Q	180	01-Oct-12	04-Apr-13
WP1-12-3-0500	Design / Procure / Planning - Replacement for 2013 - 1st Q	90	01-Oct-12	03-Jan-13
WP1-12-3-0600	Construction - Replacement for 2013 - 1st Q	180	02-Jan-13	02-Jul-13
WP1-12-4-0200	Inspect Poles for 2013 - 2nd Q	90	01-Oct-12	03-Jan-13
WP1-12-4-0300	Scope for 2013 - 2nd Q	90	01-Nov-12	04-Feb-13
WP1-12-4-0400	Construction - Reinforcing for 2013 - 2nd Q	180	02-Jan-13	02-Jul-13
WP1-12-4-0500	Design / Procure / Planning - Replacement for 2013 - 2n...	90	03-Jan-13	02-Apr-13
WP1-12-4-0600	Construction - Replacement for 2013 - 2nd Q	180	01-Apr-13	30-Sep-13
WP2-13-1-0100	Work Priority - Reinforce for 2013	0	01-Oct-12*	



I.E.3: 2012 Program Budget

Figure I.E.3 presents the estimated 2012 capital budget for the Wood Pole Inspection, Treatment and Replacement program. ComEd estimates the 2012 program cost to be capital investments of $6 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 2012 CAPITAL BUDGET

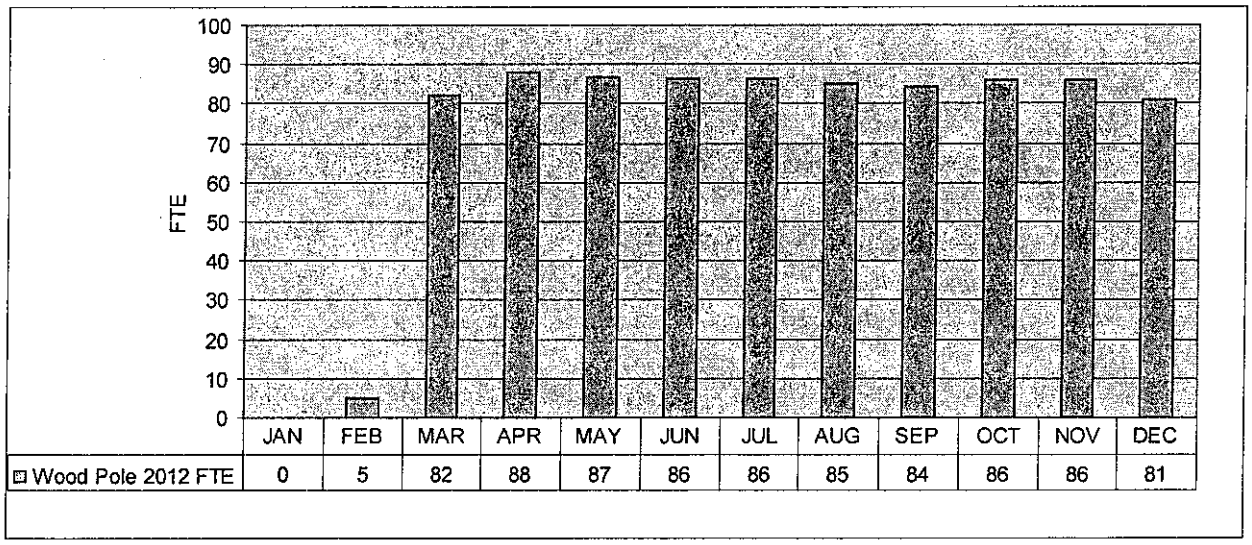


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Wood Pole Program Capital	0.1	0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
Wood Pole Cumulative Capital	0.06	0.3	0.9	1.5	2.2	2.8	3.4	4.0	4.6	5.2	5.7	6.2

I.E.4: 2012 Program FTEs

Figure I.E.4 presents the estimated FTEs to perform the scheduled scope of work for the Wood Pole Inspection, Treatment and Replacement program in 2012. FTEs have been calculated by taking the estimated worker-hours to execute the scope of work and dividing by 2,080. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support and craft.

FIGURE I.E.4: WOOD POLE INSPECTION, TREATMENT AND REPLACEMENT 2012 FTES



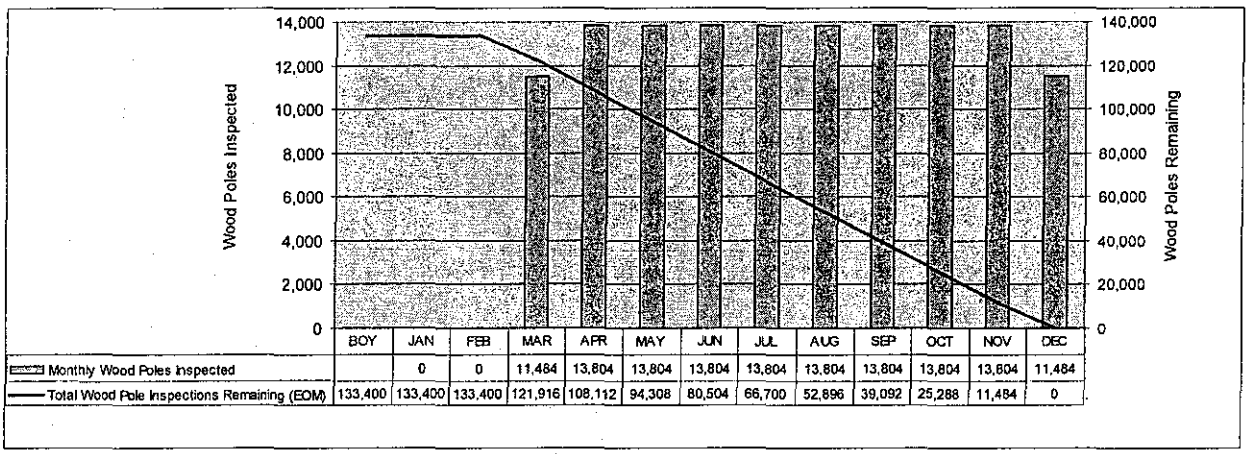
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Wood Pole 2012 FTE	0	5	82	88	87	86	86	85	84	86	86	81

I.E.5: Program Units

Wood Pole Inspection

Figure I.E.5 shows the estimated quantity of wood poles to be inspected in 2012. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. It is estimated that approximately 133,400 wood poles will be inspected in 2012. Estimates of cost, units of work, and schedules for that work may evolve over time.

FIGURE I.E.5: WOOD POLE INSPECTION UNITS

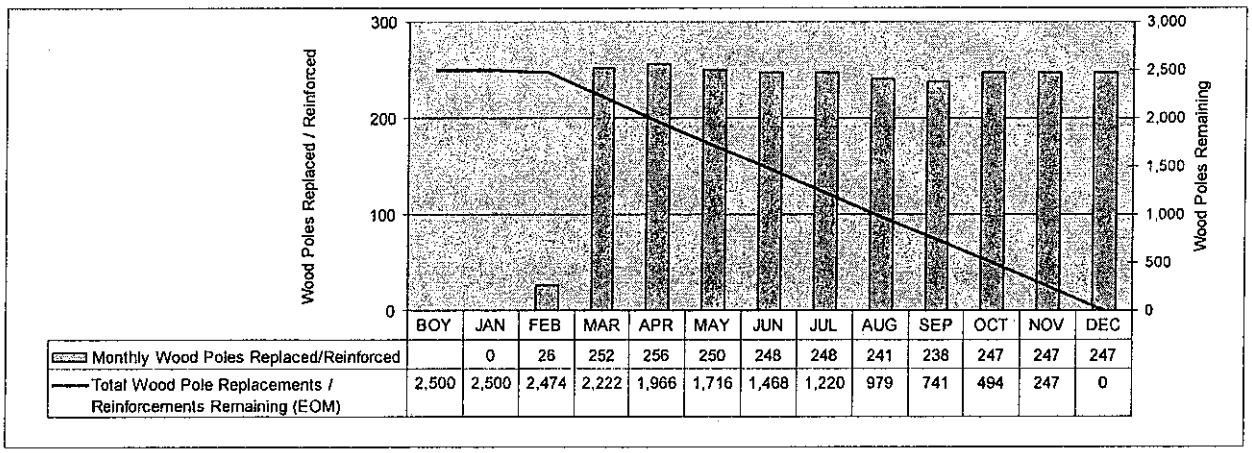


	BOY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly Wood Poles Inspected		0	0	11,484	13,804	13,804	13,804	13,804	13,804	13,804	13,804	13,804	11,484
Total Wood Pole Inspections Remaining (EOM)	133,400	133,400	133,400	121,916	108,112	94,308	80,504	66,700	52,896	39,092	25,288	11,484	0

Wood Pole Replacement/ Reinforcement

Figure I.E.6 shows the estimated quantity of wood poles to be replaced or reinforced in 2012. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. It is estimated that approximately 2,500 wood poles will be replaced or reinforced in 2012. 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. Early estimates of wood pole replacement / reinforcements such as these, therefore, contain a high degree of uncertainty and are not intended to reflect firm scope.

FIGURE I.E.6: WOOD POLE REPLACEMENT/REINFORCEMENT UNITS



	BOY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly Wood Poles Replaced/Reinforced		0	26	252	256	250	248	248	241	238	247	247	247
Total Wood Pole Replacements / Reinforcements Remaining (EOM)	2,500	2,500	2,474	2,222	1,966	1,716	1,468	1,220	979	741	494	247	0

SECTION I.F: Storm Hardening

I.F.1: 2012 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) 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 2011
- 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 2011
  - 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 2012 scope for this program will consist of prioritizing circuits and identification of appropriate hardening solutions for each, and addressing 2012 priority circuits.

I.F.2: 2012 Program Schedule

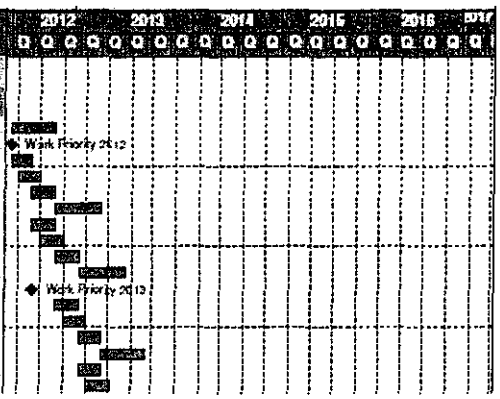
Figure I.F.2 presents the estimated schedule to complete the Storm Hardening program. Estimates of cost, units of work, and schedules for that work, may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2012 Plan, including the following key tasks:

- Ramp-up period

- Establish 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
- Planning (develop work packages and secure permits)
- Construction – Install conduit when required
- Construction – Cable terminal pole work
- Construction – Install cable / overhead conductor / other engineered solutions
- Test cable / conductor and liven

FIGURE I.F.2: STORM HARDENING 2012 SCHEDULE

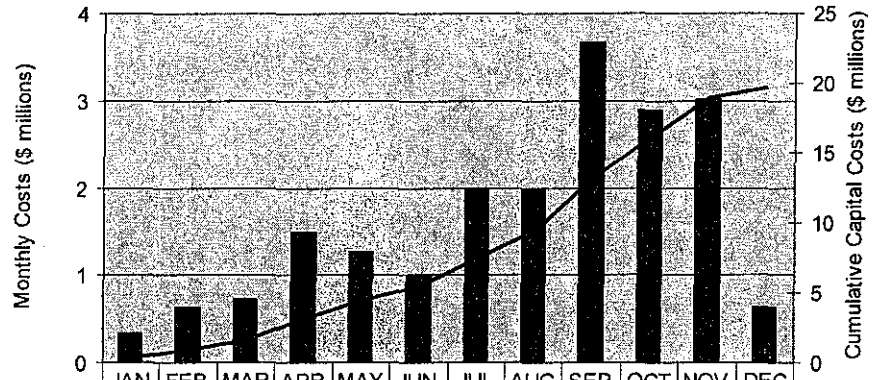
Activity ID	Activity Name	Cal. Days	Start	Finish
ComEd Infrastructure Investment Plan		1233	01-Jan-12	20-Oct-16
Storm Hardening		1233	01-Jan-12	20-Oct-16
FT1-12-1-0000	Mobilization Ramp Up	180	01-Jan-12	01-Jul-12
FT1-12-1-0100	Work Priority 2012	0	01-Jan-12	
FT1-12-1-0150	Work Scope - 2012 3rd Q	90	01-Jan-12	01-Apr-12
FT1-12-1-0200	Design / Procure / Outage - 2012 3rd Q	90	01-Feb-12	30-Apr-12
FT1-12-1-0250	Work Planning - 2012 3rd Q	90	01-Apr-12	30-Jun-12
FT1-12-1-0300	Construction - Overhead - 2012 3rd Q	180	01-Jul-12	03-Jan-13
FT1-12-2-0150	Work Scope - 2012 4th Q	90	01-Apr-12	30-Jun-12
FT1-12-2-0200	Design / Procure / Outage - 2012 4th Q	90	01-May-12	31-Jul-12
FT1-12-2-0250	Work Planning - 2012 4th Q	90	01-Jul-12	30-Sep-12
FT1-12-2-0300	Construction - Overhead - 2012 4th Q	180	01-Oct-12	04-Apr-13
FT1-12-3-0100	Work Priority 2013	0	01-Apr-12	
FT1-12-3-0150	Work Scope - 2013 1st Q	90	01-Jul-12	30-Sep-12
FT1-12-3-0200	Design / Procure / Outage - 2013 1st Q	90	01-Aug-12	30-Oct-12
FT1-12-3-0250	Work Planning - 2013 1st Q	90	01-Oct-12	03-Jan-13
FT1-12-3-0300	Construction - Overhead - 2013 1st Q	180	02-Jan-13	02-Jul-13
FT1-12-4-0150	Work Scope - 2013 2nd Q	90	01-Oct-12	03-Jan-13
FT1-12-4-0200	Design / Procure / Outage - 2013 2nd Q	90	01-Nov-12	04-Feb-13



I.F.3: 2012 Program Budget

Figure I.F.3 presents the estimated 2012 capital budget for the Storm Hardening program. ComEd estimates the 2012 program cost to be capital investments of $20 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 2012 CAPITAL BUDGET

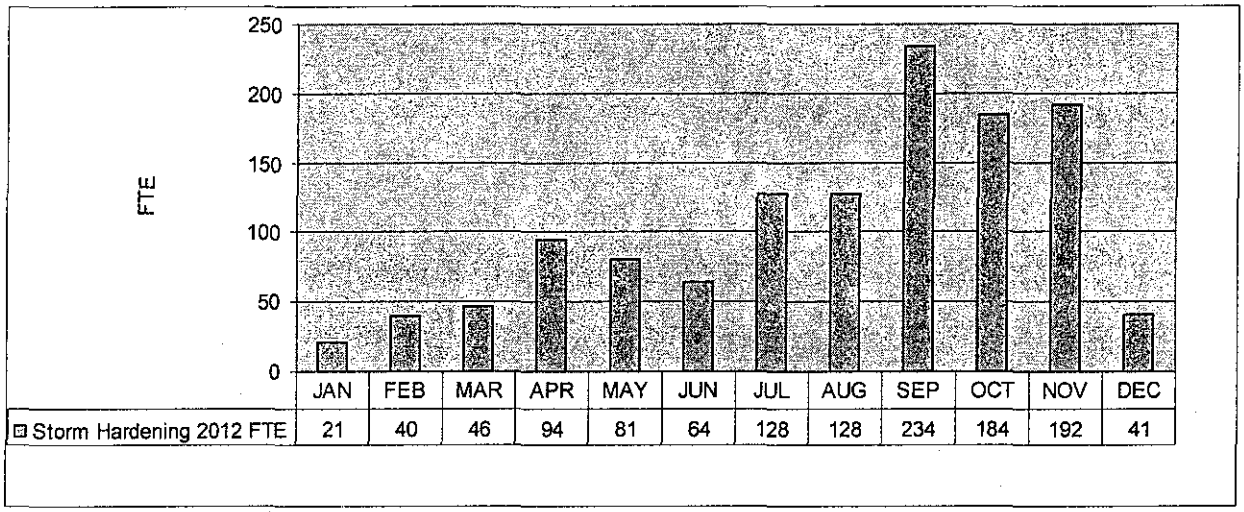


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Storm Hardening Program Capital	0.3	0.6	0.7	1.5	1.3	1.0	2.0	2.0	3.7	2.9	3.0	0.6
Storm Hardening Cumulative Capital	0.3	1.0	1.7	3.2	4.4	5.4	7.4	9.4	13.1	16.0	19.0	19.6

I.F.4: 2012 Program FTEs

Figure I.F.4 presents the estimated FTEs to perform the scheduled 2012 scope of work for the Storm Hardening program. FTEs have been calculated by taking the estimated worker-hours to execute the scope of work and dividing by 2,080. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support and craft.

FIGURE I.F.4: STORM HARDENING 2012 FTES



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Storm Hardening 2012 FTE	21	40	46	94	81	64	128	128	234	184	192	41

SECTION II: SMART GRID-RELATED INVESTMENTS

SECTION II.A: Distribution Automation

II.A.1: 2012 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 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 470 new DA devices in 2012.

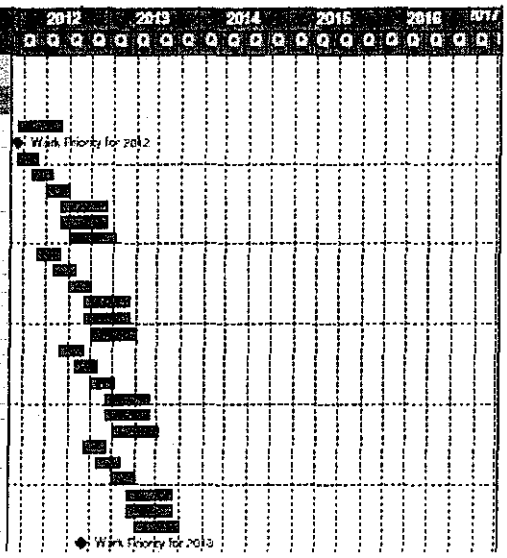
II.A.2: 2012 Program Schedule

Figure II.A.2 presents the estimated schedule to complete the DA 2012 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 2012 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

FIGURE II.A.2: DISTRIBUTION AUTOMATION 2012 SCHEDULE

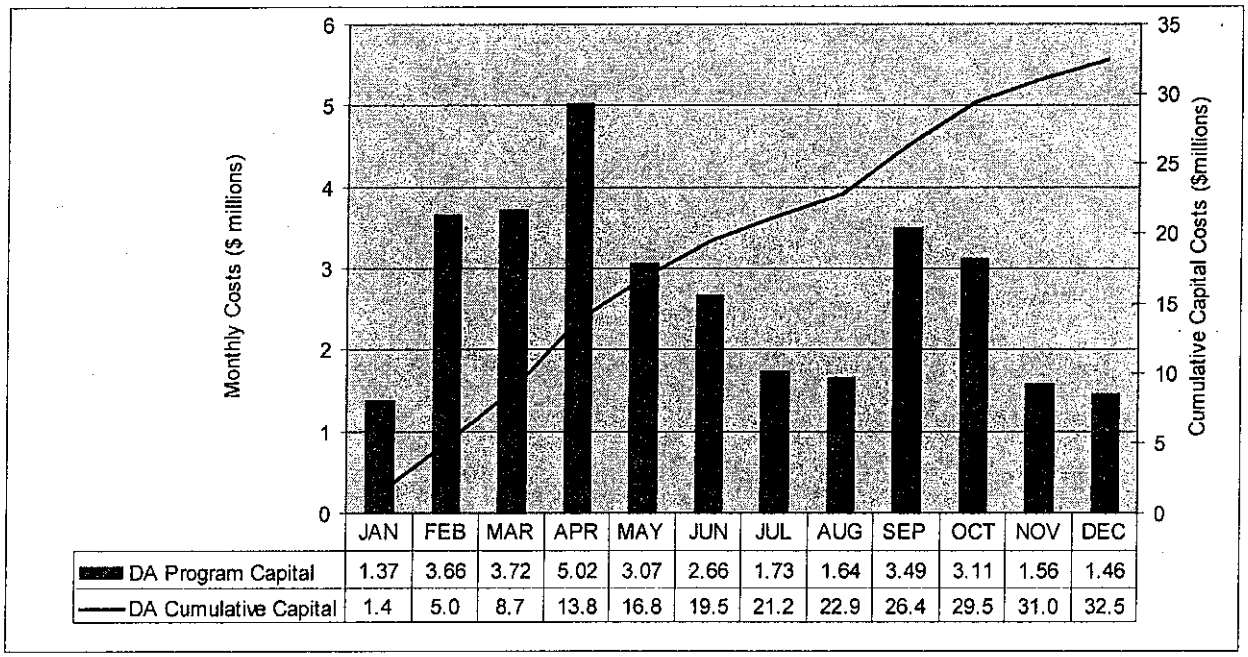
Activity ID	Activity Name	Cal. Days	Start	Finish
ComEd Infrastructure Investment Plan		1188	01-Jan-12	20-Aug-16
Distribution Automation		[illegible]	[illegible]	[illegible]
DA1-12-1-0001	Mobilization Ramp Up	180	01-Jan-12	01-Jul-12
DA1-12-1-0100	Work Priority for 2012	0	01-Jan-12	
DA1-12-1-0200	Scoping (Schema, Relay Setting Order & Repeater) for 2	90	01-Jan-12	01-Apr-12
DA1-12-1-0300	Design / Procure / Outage for 2012 - 3rd Q	90	01-Mar-12	30-May-12
DA1-12-1-0400	Planning for 2012 - 3rd Q	90	01-May-12	31-Jul-12
DA1-12-1-0600	Construction - Reclosers for 2012 - 3rd Q	180	01-Jul-12	03-Jan-13
DA1-12-1-0650	Construction - Install Radio / Repeater for 2012 - 3rd Q	180	01-Jul-12	03-Jan-13
DA1-12-1-0700	Testing & Livening for 2012 - 3rd Q	180	01-Aug-12	03-Feb-13
DA1-12-2-0200	Scoping (Schema, Relay Setting Order & Repeater) for 2	90	01-Apr-12	30-Jun-12
DA1-12-2-0300	Design / Procure / Outage for 2012 - 4th Q	90	01-Jun-12	30-Aug-12
DA1-12-2-0400	Planning for 2012 - 4th Q	90	01-Aug-12	30-Oct-12
DA1-12-2-0600	Construction - Reclosers for 2012 - 4th Q	180	01-Oct-12	04-Apr-13
DA1-12-2-0650	Construction - Install Radio / Repeater for 2012 - 4th Q	180	01-Oct-12	04-Apr-13
DA1-12-2-0700	Testing & Livening for 2012 - 4th Q	180	01-Nov-12	05-May-13
DA1-12-3-0200	Scoping (Schema, Relay Setting Order & Repeater) for 2	90	01-Jul-12	30-Sep-12
DA1-12-3-0300	Design / Procure / Outage for 2013 - 1st Q	90	01-Sep-12	03-Dec-12
DA1-12-3-0400	Planning for 2013 - 1st Q	90	01-Nov-12	04-Feb-13
DA1-12-3-0600	Construction - Reclosers for 2013 - 1st Q	180	02-Jan-13	02-Jul-13
DA1-12-3-0650	Construction - Install Radio / Repeater for 2013 - 1st Q	180	02-Jan-13	02-Jul-13
DA1-12-3-0700	Testing & Livening for 2013 - 1st Q	180	01-Feb-13	01-Aug-13
DA1-12-4-0200	Scoping (Schema, Relay Setting Order & Repeater) for 2	90	01-Oct-12	03-Jan-13
DA1-12-4-0300	Design / Procure / Outage for 2013 - 2nd Q	90	01-Dec-12	04-Mar-13
DA1-12-4-0400	Planning for 2013 - 2nd Q	90	01-Feb-13	01-May-13
DA1-12-4-0600	Construction - Reclosers for 2013 - 2nd Q	180	01-Apr-13	30-Sep-13
DA1-12-4-0650	Construction - Install Radio / Repeater for 2013 - 2nd Q	180	01-Apr-13	30-Sep-13
DA1-12-4-0700	Testing & Livening for 2013 - 2nd Q	180	01-May-13	30-Oct-13
DA2-13-1-0100	Work Priority for 2013	0	01-Oct-12	



II.A.3: 2012 Program Budget

Figure II.A.3 presents the estimated 2012 capital budget for the DA program. ComEd estimates the program cost to be capital investments of $33 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 2012 CAPITAL BUDGET

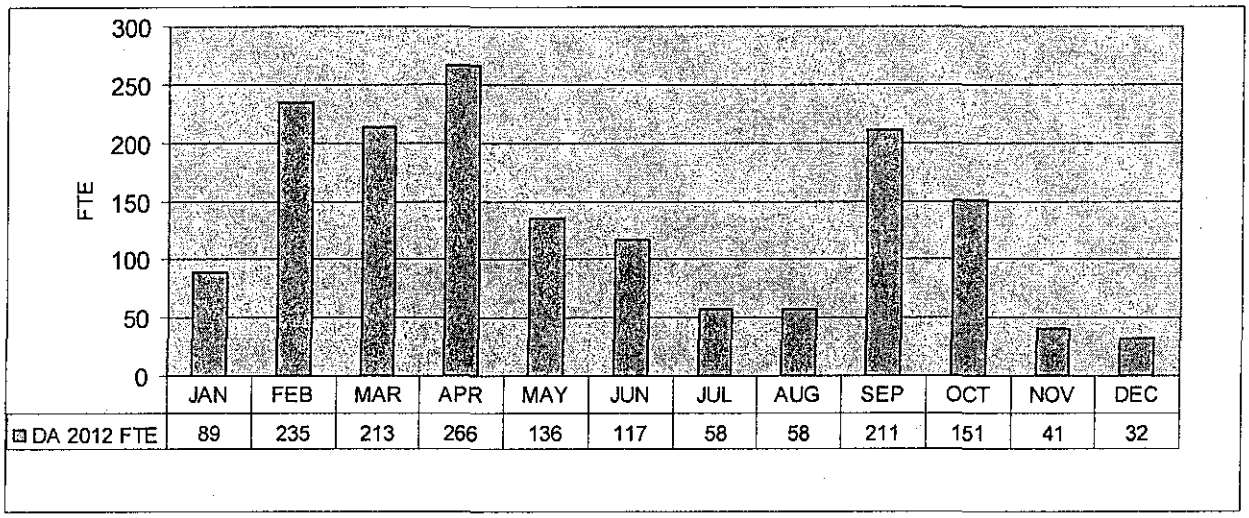


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DA Program Capital	1.37	3.66	3.72	5.02	3.07	2.66	1.73	1.64	3.49	3.11	1.56	1.46
DA Cumulative Capital	1.4	5.0	8.7	13.8	16.8	19.5	21.2	22.9	26.4	29.5	31.0	32.5

II.A.4: 2012 Program FTEs

Figure II.A.4 presents the estimated FTEs required to perform the scheduled 2012 scope of work. FTEs have been calculated by taking the estimated worker-hours to execute the scope of work and dividing by 2,080. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support and craft.

FIGURE II.A.4: DISTRIBUTION AUTOMATION 2012 FTES

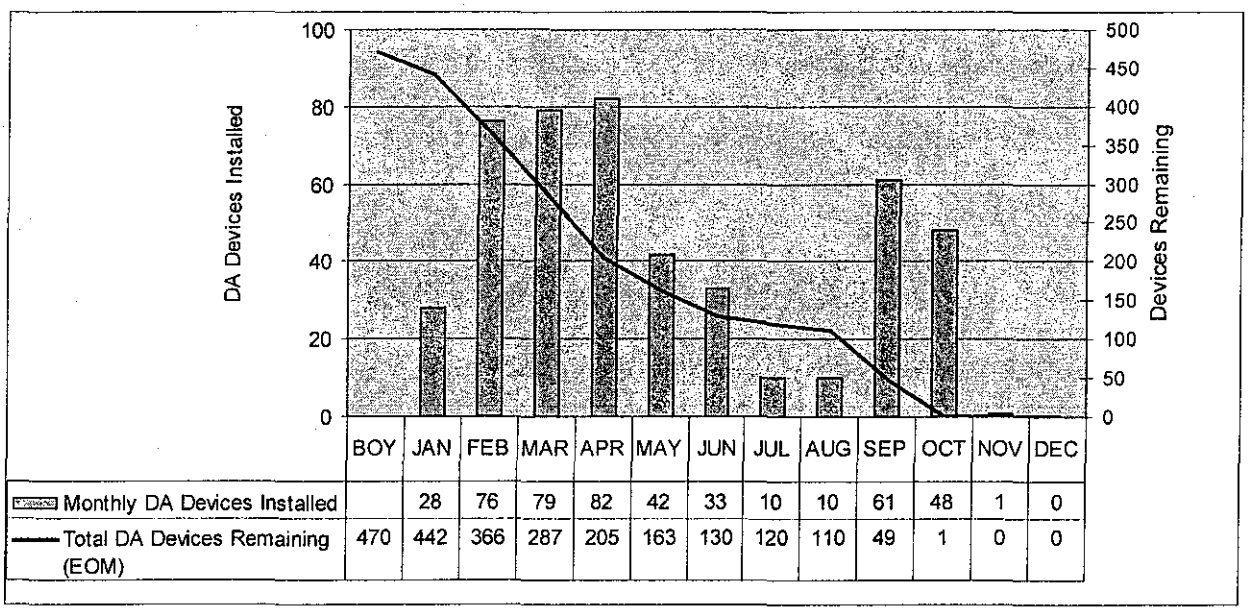


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DA 2012 FTE	89	235	213	266	136	117	58	58	211	151	41	32

II.A.5: 2012 Program Units

Figure II.A.5 shows the estimated quantity of DA devices to be installed in 2012. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work to be accomplished, as well as the scope of work left to be performed. It is estimated that approximately 470 DA devices will be installed in 2012. Estimates of cost, units of work, and schedules for that work may evolve over time.

FIGURE II.A.5: DISTRIBUTION AUTOMATION 2012 UNITS



	BOY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Monthly DA Devices Installed		28	76	79	82	42	33	10	10	61	48	1	0
Total DA Devices Remaining (EOM)	470	442	366	287	205	163	130	120	110	49	1	0	0

SECTION II.B: Substation Micro-Processor Relay Upgrades

II.B.1: 2012 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 2012 scope of work for this program includes upgrade of one substation, and initial design and engineering for two substations that are planned for upgrade in 2013.

II.B.2: 2012 Program Schedule

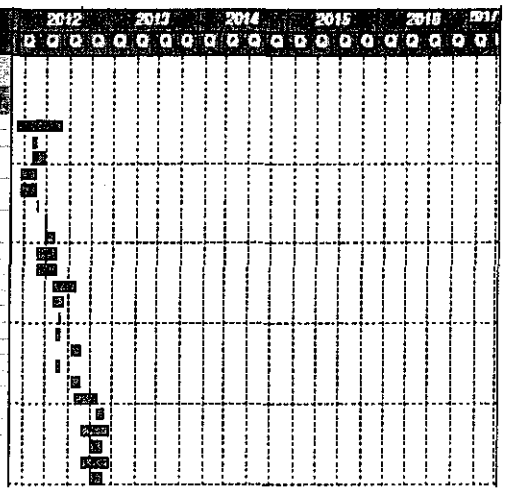
Figure II.B.2 presents the estimated schedule to complete the Substation Micro-Processor Relay Upgrade 2012 scope of work. Estimates of cost, units of work, and schedules for that work may evolve over time. The schedule consists of high level tasks for the scope of work associated with the 2012 Plan, 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
- Relay and protection schemes
- Planning tasks
- Construction – install conduit, breakers, monitoring, micro-processor relays
- Test and liven

FIGURE II.B.2: SUBSTATION UPGRADE 2012 SCHEDULE

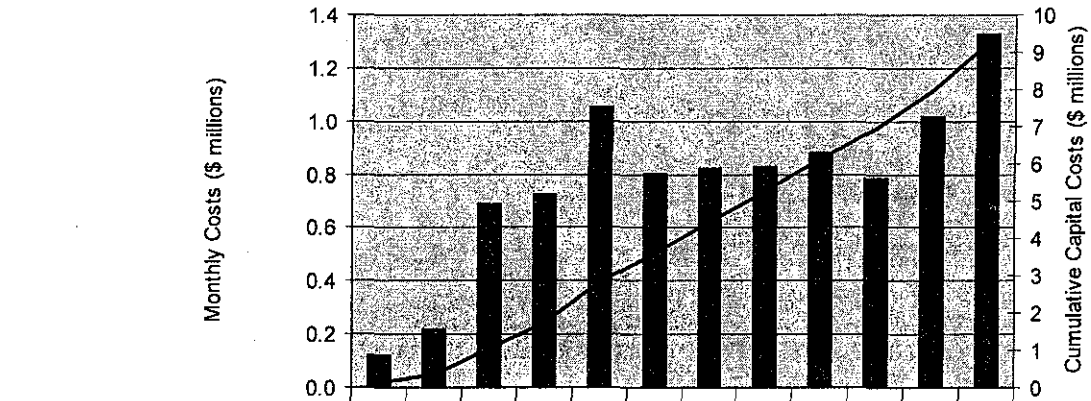
Activity ID	Activity Name	Cal. Days	Start	Finish
ComEd Infrastructure Investment Plan		1049	01-Jan-12	04-Jan-16
Substation Micro Processor Relay Upgrades		[illegible]	[illegible]	[illegible]
IS1-12-1-0001	Program Mobilization & Ramp Up	180	01-Jan-12*	01-Jul-12
IS1-12-1-0010	Mobilization - Intel. Sub. #1	12	05-Mar-12*	16-Mar-12
IS1-12-1-0020	AC/DC Panel Install - Intel. Sub. #1	47	05-Mar-12	20-Apr-12
IS1-12-1-0030	Develop Work Scope - Intel. Sub. #2	60	17-Jan-12*	16-Mar-12
IS1-12-1-0040	Develop Work Scope - Intel. Sub. #3	60	17-Jan-12	16-Mar-12
IS1-12-1-0050	Schedule 2013 Transmission Outages	0	30-Mar-12	30-Mar-12
IS1-12-1-0060	Remote Terminal Work - Intel. Sub. #1	5	30-Apr-12	04-May-12
IS1-12-1-0070	Transmission Line Outage Related Work - Intel. Sub. #1	32	30-Apr-12	01-Jun-12
IS1-12-1-0080	Design & Engineer - Intel. Sub. #2	70	30-Mar-12	08-Jun-12
IS1-12-1-0090	Design & Engineer - Intel. Sub. #3	70	30-Mar-12	08-Jun-12
IS1-12-1-0100	Construction - Substation Outages Suspended	91	01-Jun-12*	31-Aug-12
IS1-12-1-0110	Non-Outage Related Work - Intel. Sub. #1	47	01-Jun-12	18-Jul-12
IS1-12-1-0120	Schedule 2013 Distribution Bus Outages	0	29-Jun-12*	29-Jun-12
IS1-12-1-0130	Procure Long Lead Times - Intel. Sub. #2	9	25-Jun-12	29-Jun-12
IS1-12-1-0140	Issue & Review Construction Drawings - Intel. Sub. #2	35	17-Aug-12	21-Sep-12
IS1-12-1-0150	Procure Long Lead Times - Intel. Sub. #3	9	22-Jun-12	29-Jun-12
IS1-12-1-0160	Issue & Review Construction Drawings - Intel. Sub. #3	35	17-Aug-12	21-Sep-12
IS1-12-1-0170	Bus Outage Related Work /Bus Relays, Trace Monitoring	58	01-Sep-12	30-Nov-12
IS1-12-1-0180	Final Wiring & Commissioning - Intel. Sub. #1	76	01-Dec-12	28-Dec-12
IS1-12-1-0190	Develop Relay & SCADA Settings - Intel. Sub. #2	107	24-Sep-12	13-Jan-13
IS1-12-1-0200	Develop Dashboard - Intel. Sub. #2	49	01-Nov-12	21-Dec-12
IS1-12-1-0210	Develop Relay & SCADA Settings - Intel. Sub. #3	107	24-Sep-12	13-Jan-13
IS1-12-1-0220	Develop Dashboard - Intel. Sub. #3	49	01-Nov-12	21-Dec-12



II.B.3: 2012 Program Budget

Figure II.B.3 presents the estimated 2012 capital budget for the Substation Micro-Processor Relay Upgrade program. ComEd estimates the 2012 program cost to be capital investments of $9 million, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

FIGURE II.B.3: SUBSTATION UPGRADE 2012 CAPITAL BUDGET

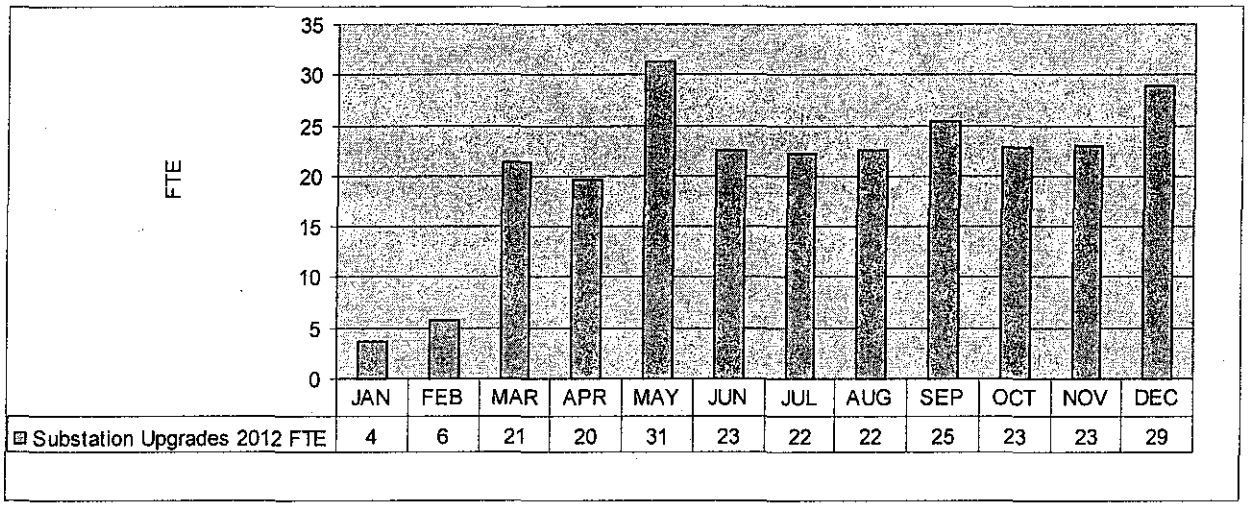


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Substation Program Capital	0.1	0.2	0.7	0.7	1.1	0.8	0.8	0.8	0.9	0.8	1.0	1.3
Substation Cumulative Capital	0.1	0.3	1.0	1.8	2.8	3.6	4.4	5.3	6.2	6.9	8.0	9.3

II.B.4: 2012 Program FTEs

Figure II.B.4 presents the estimated FTEs required to perform the scheduled 2012 scope of work. FTEs have been calculated by taking the estimated worker-hours to execute the scope of work and dividing by 2,080. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support and craft.

FIGURE II.B.4: SUBSTATION UPGRADE 2012 FTES



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Substation Upgrades 2012 FTE	4	6	21	20	31	23	22	22	25	23	23	29

SECTION II.C: Smart Meters

ComEd will install retail Smart Meters across its entire service territory over a 10-year period. Deployment of Smart Meters will occur pursuant to the Advanced Metering Infrastructure Deployment Plan ("AMI Plan") to be filed with the Commission no later than April 23, 2012. Prior to ComEd's filing, ComEd will review its proposed AMI Plan with the Smart Grid Advisory Council. Although the AMI Plan is currently under development, in general ComEd expects at this time that Smart Meter installs pursuant to the AMI Plan will begin in the 3rd quarter of 2012, ending in 2021.

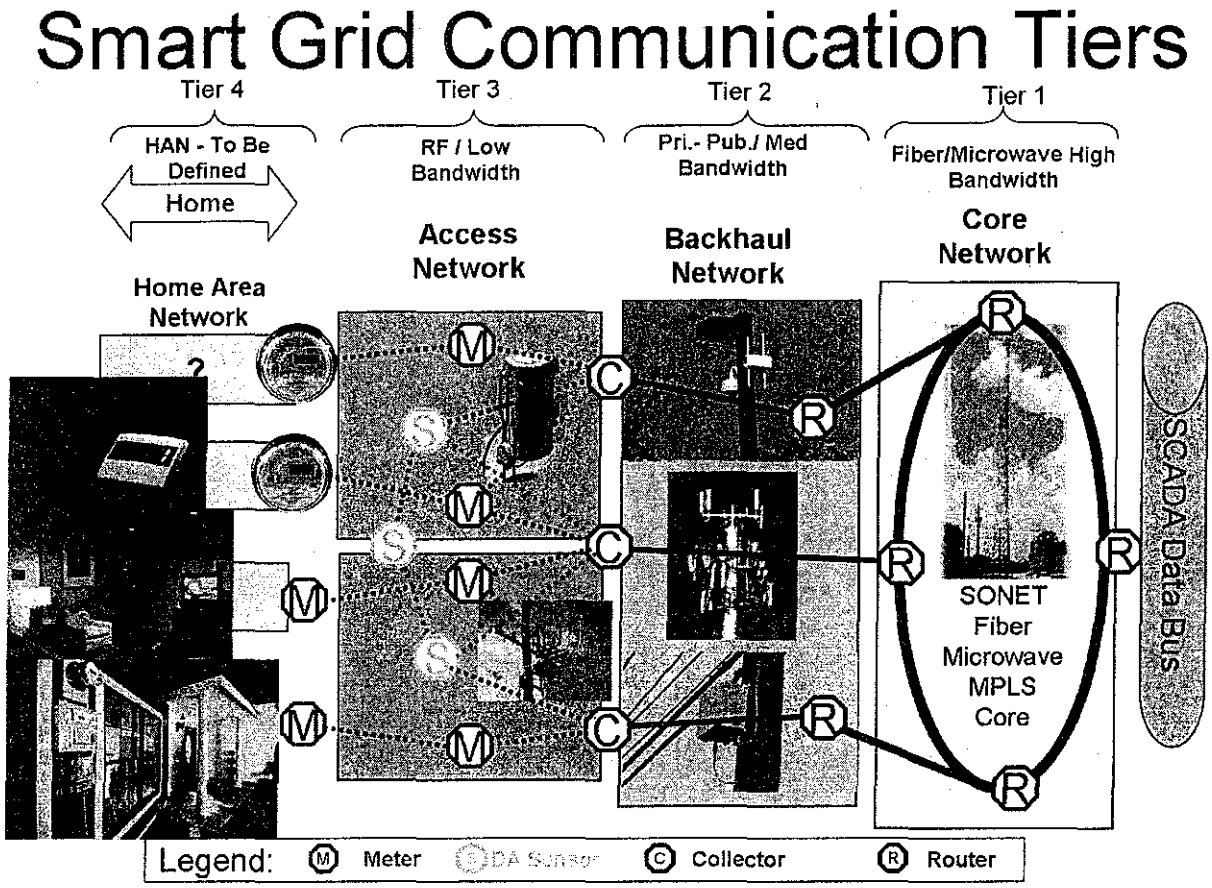
SECTION II.D. Associated Cyber Secure Data Communications Network

Communications infrastructure forms the foundation platform for enabling Smart Grid technologies and applications as it transcends each functional area of the Smart Grid. Consequently, the ComEd Smart Grid Communications Infrastructure will provide a secure tiered, robust and deterministic communications architecture with adequate capacity to meet the current and foreseeable future performance requirements of the Smart Grid Application portfolio.

A cyber-secure communications infrastructure is a system that includes and implements a robust security model that is aligned with industry best practices and existing security standards (such as NISTIR 7628 developed by the National Institute of Standards and Technology). The security model will address confidentiality, integrity, availability and non-repudiation of data transport through the network.

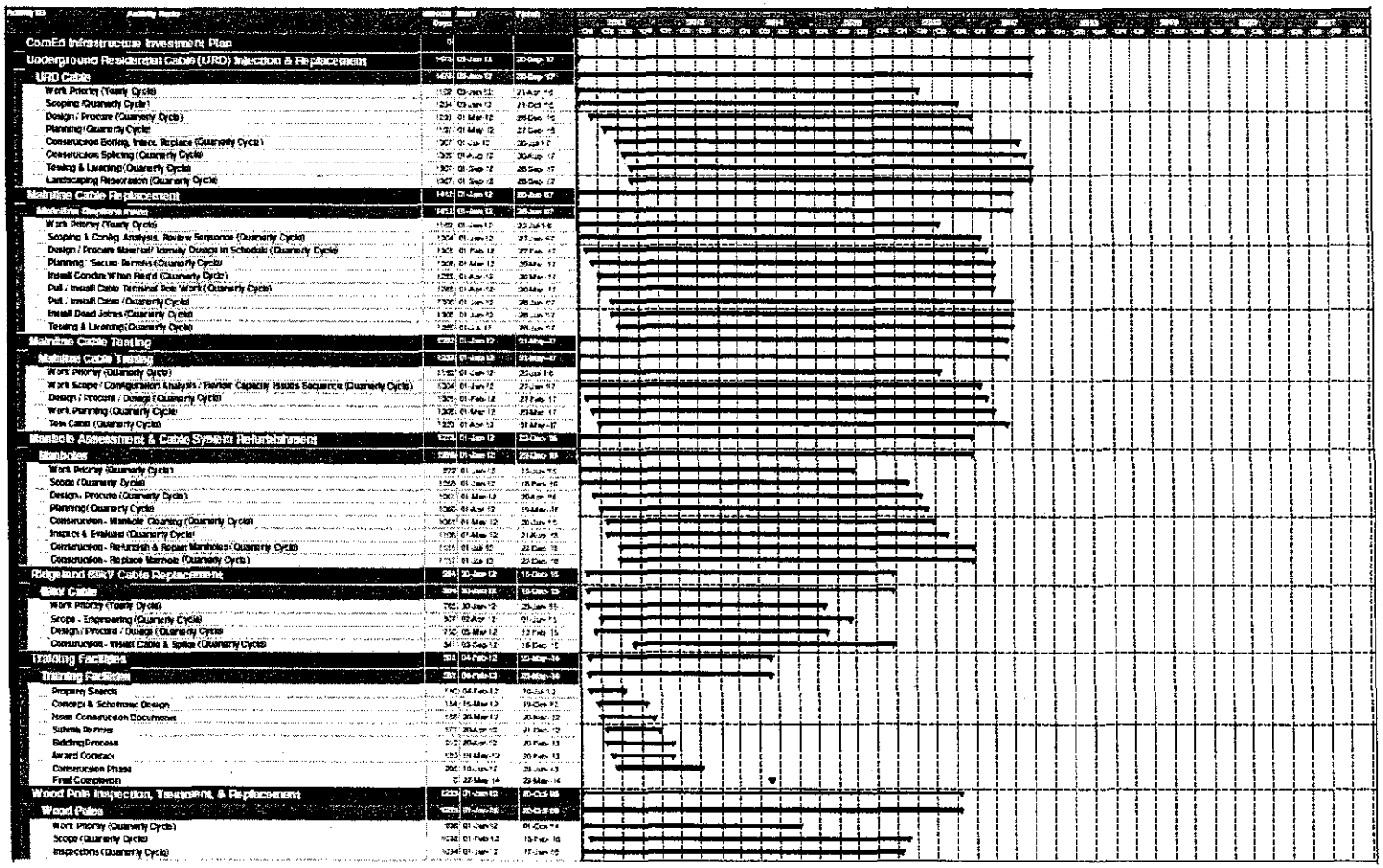
Figure II.D depicts the high-level architecture for the four tiers of the proposed ComEd communication network that would support Smart Grid communication.

FIGURE II.D: SMART GRID COMMUNICATION TIERS



Appendix A: Summary-Level Plan Information

FIGURE A.1: PLAN SUMMARY SCHEDULE



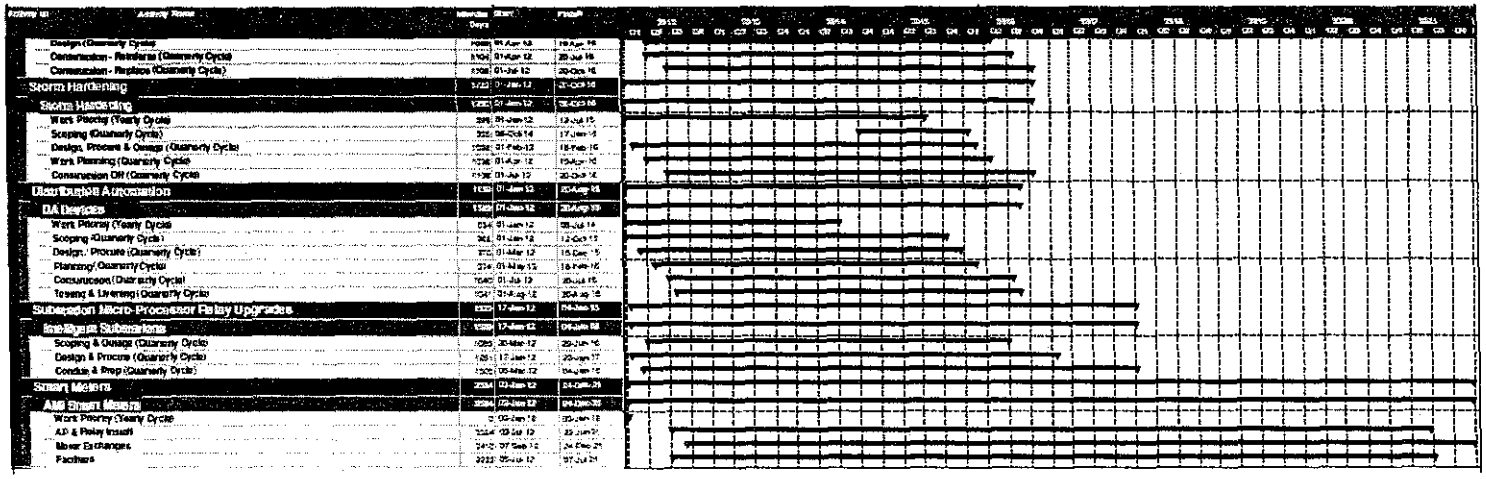
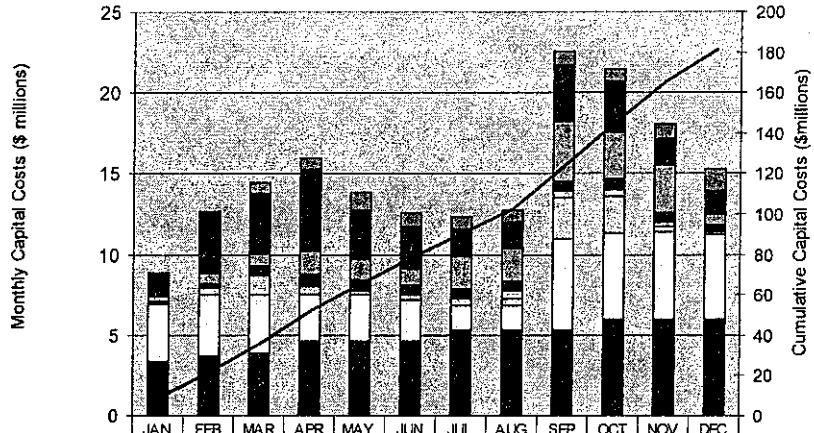

Storm Hardening
Storm Hardening
Work Priority (Yearly Cycle)
Scoping (Quarterly Cycle)
Design, Procure & Outage (Quarterly Cycle)
Work Planning (Quarterly Cycle)
Construction Off (Quarterly Cycle)
Distribution Automation
DA Devices
Work Priority (Yearly Cycle)
Scoping (Quarterly Cycle)
Design, Procure (Quarterly Cycle)
Planning (Quarterly Cycle)
Construction (Quarterly Cycle)
Testing & Licensing (Quarterly Cycle)
Substation Micro-Processor Relay Upgrades
Substations
Scoping & Outage (Quarterly Cycle)
Design & Procure (Quarterly Cycle)
Smart Meters
AMI Smart Meters
Work Priority (Yearly Cycle)
AP & Relay Install
Meter Exchanges
Facilities

Table A.1 presents a summary of the 2012 Plan's estimated total capital budget by program, and Figure A.2 presents the estimated total capital budget by month associated with the 2012 Plan. Note that the costs by month shown in Figure A.2 exclude costs for the Smart Meter Program, which will be included in ComEd's AMI Plan.

TABLE A.1: 2012 PLAN CAPITAL COSTS BY PROGRAM

Program	**Capital Total**
URD Injection and Replacement Program	*$59*
Mainline Cable System Refurbishment and Replacement Program	*$44*
Ridgeland 69kV Cable Program	*$8*
Training Facilities Program	*$3*
Wood Pole Program	*$6*
Storm Hardening Program	*$20*
Total Reliability-Related Investments	**$139**
Distribution Automation Program	*$32*
Substation Micro-Processor Relay Upgrade Program	*$9*
Smart Meter Program	*$52*
Total Smart Grid Related Investments	**$94**
Total 2012 Plan Investments	**$233**

FIGURE A.2: 2012 PLAN CAPITAL COSTS

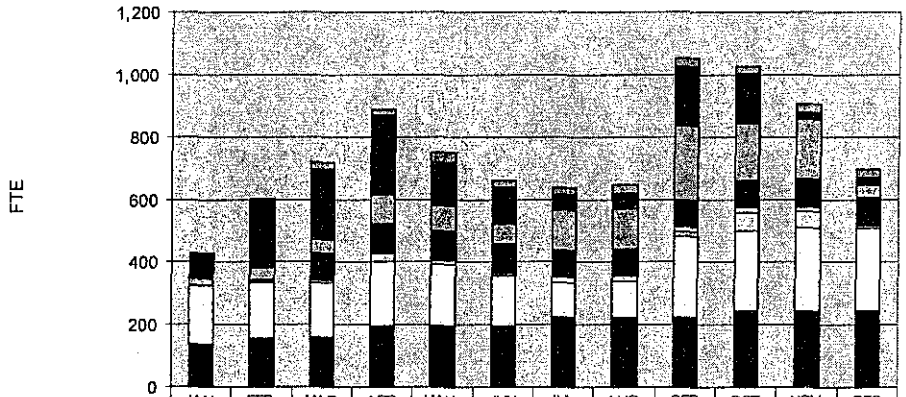


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Substation Program Capital	0.1	0.2	0.7	0.7	1.0	0.8	0.8	0.8	0.9	0.8	1.0	1.3
DA Program Capital	1.37	3.66	3.72	5.02	3.07	2.66	1.73	1.64	3.49	3.11	1.56	1.46
Storm Hardening Program Capital	0.3	0.6	0.7	1.5	1.3	1.0	2.0	2.0	3.7	2.9	3.0	0.6
Wood Pole Program Capital	0.1	0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
Training Facilities Program Capital	0.02	0.02	0.02	0.04	0.05	0.3	0.4	0.5	0.5	0.4	0.2	0.1
69kV Cable Program Capital	0.03	0.5	1.2	0.5	0.3	0.0	0.0	0.5	2.5	2.3	0.3	
Mainline Program Capital	3.6	3.7	3.6	2.9	2.8	2.5	1.5	1.5	5.7	5.3	5.4	5.2
URD Program Capital	3.4	3.8	3.9	4.7	4.7	4.7	5.3	5.3	5.3	6.0	6.0	6.0
Cumulative Capital	8.9	21.6	36.0	52.0	65.8	78.3	90.7	103.0	123.5	145.2	165.2	180.8

Figure A.3 presents the total estimated FTEs to execute the scheduled scope of work associated with the 2012 Plan. The estimated FTEs shown in Figure A.3 do not, however, include any induced FTEs.

FIGURE A.3: 2012 PLAN FTES

(does not include induced FTEs)



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Substation Upgrades 2012 FTE	4	6	21	20	31	23	22	22	25	23	23	29
DA 2012 FTE	79	215	223	255	142	116	51	51	195	159	26	23
Storm Hardening 2012 FTE	21	40	46	94	81	64	128	128	234	184	192	41
Wood Pole 2012 FTE	0	5	82	88	87	86	86	85	84	86	86	81
Training Facilities 2012 FTE	2	2	2	3	4	7	16	21	21	18	13	8
69kV Cable Replacement 2012 FTE	1	1	11	27	13	7	0	0	11	58	53	7
Mainline 2012 FTE	183	181	172	205	197	161	114	115	260	252	263	261
URD 2012 FTE	140	154	161	197	197	197	222	222	222	247	247	248