ComEd
An Exelon Company

Commonwealth Edison Company's Plan for the Creation, Operation, and Administration of a Smart Grid Test Bed

Attachment 1: Smart Grid Test Bed Plan

January 6, 2012

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Introduction

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"). In testimony filed at the same time, ComEd confirmed its election to be a "participating utility" and committed to undertake the investments described in Section 16-108.5 of the Act. As a result, subsection 16-108.5(b) of the Act requires ComEd, within 60 days of filing Rate DSPP, to submit to the Commission its plan, including scope, schedule, and staffing, for satisfying its infrastructure investment program commitments pursuant to subsection (b). The Act also requires that the overall infrastructure plan include a plan for the creation, operation, and administration of a Smart Grid test bed ("Test Bed") as described in subsection (c) of Section 16-108.8. Accordingly, ComEd submits, for informational purposes, this Test Bed Plan ("Plan") to the Commission.

The purpose of the Test Bed is to provide facilities where Applicants (as defined below) will have opportunities to test Smart Grid programs, technologies, business models, and other Smart Grid-related activities. ComEd's goal is not to provide a lab where investigational ideas are tested out; those facilities exist and such tests are not appropriate for a live environment. Rather, the Test Bed is aimed at providing a new and nearly unique opportunity for Applicants to demonstrate, in an open and unbiased manner, how working technology actually operates in a live utility scale environment. The Test Bed will allow approved Applicants, subject to protections discussed in this

Plan, to connect equipment to the utility grid for the purpose of demonstrating that the equipment or systems function as designed. The Test Bed is designed to help validate Applicant-sponsored business models or services by permitting demonstration of the functional aspects of specific equipment and/or verification that services/business models provide the intended results, all based upon the approved Applicants proposals.

ComEd's Test Bed Plan is based on information currently available to ComEd and faithfully reflects ComEd's current plan for the creation, operation, and administration of its Test Bed. The Plan may evolve and be revised, consistent with requirements of the Public Utilities Act as additional and newer information (including input and information received from others) is obtained, and as ComEd gains experience operating the Test Bed. In particular, while the Smart Grid Advisory Council has not yet been formally constituted, ComEd will actively seek its input in connection with the continued development of the Test Bed and of this Plan. Therefore, ComEd must at all times reserve the right to revise and supplement the process of creating, operating, and administering its Smart Grid Test Bed, consistent with the law, in light of that information and other future developments. In the event that Section 16-108.5 becomes inoperative or Rate DSPP is terminated, then the Plan also becomes inoperative and terminates immediately.

Smart Grid Test Bed Objectives:

For the types of technologies, business models, and other Smart Grid-related activities ready for utility system installation and demonstration testing, the ComEd Smart Grid Test Bed will:

1. Provide an open, unbiased opportunity for testing programs, technologies, business models, and other Smart Grid-related activities;
2. Provide on-grid locations for the testing of such potentially innovative Smart Grid-related technologies and services, including, but not limited to, those funded by the Illinois Science and Energy Innovation Trust;
3. Facilitate testing of business models or services that help integrate Smart Grid-related technologies into the electric grid, especially those business models that may help to promote new products and services for retail customers, subject to appropriate customer protections and limitations required by law;
4. Offer opportunities to test and showcase Smart Grid technologies and services, especially those likely to support the economic development goals of the State of Illinois; and
5. Adequately protect the safety and security of the grid and of ComEd's grid operations, both through how Applicants and Applicant-sponsored technology is selected and how the Test Bed itself is operated.

By accomplishing these objectives, ComEd should become an industry leader in identifying and supporting Smart Grid solutions. This document is organized accordingly to provide the details of the Smart Grid Test Bed implementation in ComEd's territory and includes the following information:

- **General ComEd Test Bed Overview** – Provides a brief overview of what is contained in the ComEd Smart Grid Test Bed Plan.

- **The Proposed Test Bed location** – Details the ComEd location for the Smart Grid Test Bed and provides insight into the specific technologies and voltages available for demonstrating Smart Grid-related programs, technologies, business models, and other Smart Grid-related activities.

- **How to receive, review and qualify proposal(s) for Test Bed use** – Outlines the application, review and qualification processes ComEd will use for a Smart Grid Test Bed Applicant who wishes to demonstrate a Smart Grid-related program, technology, business model, or other Smart Grid-related activity.

- **Criteria that will be used to qualify Test Bed proposals** – Outlines the criteria that ComEd will use when evaluating any Test Bed Applicant's proposed Smart Grid-related program, technology, business model, or other Smart Grid-related activity.

- **Engineering and operations support for Test Bed Applicants** – Describes the engineering and operational support that will be provided to approved Smart Grid Test Bed Applicants for proposed Smart Grid-related programs, technologies, business models, and other Smart Grid-related activities as well as addressing the requirements of physical implementations related to on-grid-related demonstrations, provisioning of customer data and ultimate control of the ComEd Smart Grid Test Bed.

- **Estimated cost to establish and operate the Test Bed** – Outlines the estimated cost provisions necessary for the implementation and ongoing aspects of the ComEd Smart Grid Test Bed.

ComEd Smart Grid Test Bed Overview

Implementation

The Plan details the creation, operation and administration of the physical location within ComEd's distribution system for the demonstration of Smart Grid applications. It designates the location in which the Test Bed resides; details how ComEd will receive, review, and qualify proposals submitted by Applicants; provides the criteria that will be used to evaluate and qualify the proposals of Applicants; estimates the engineering and operation support services and resulting costs required to establish, administer and promote the Test Bed.

Smart Grid Test Bed Participants

The Test Bed will be open to all qualified Applicants that want to demonstrate a Smart Grid application that follows the process outlined in this document for on-grid evaluation.

Operational Control

ComEd will retain full and undiminished control of its electric delivery, metering, and customer operations system, and of all of its utility operations, and reserves the right to reject Applicants and/or Smart Grid applications that, in its sole judgment, could threaten the reliability, safety, performance, security, or operations of ComEd's grid or other utility systems, or the security, or privacy, of customer-identifiable data. Additionally, ComEd has the right to limit the number of Smart Grid applications and Participants utilizing the Test Bed at any time based on its determination of the ability to

operate and maintain a secure, safe, and reliable grid. If a defect or misoperation occurs or is detected, then at ComEd's sole discretion and at the sole expense of the Applicant, equipment, software, and/or other components of the Application will be immediately isolated and/or removed. Interruptions resulting from Test Bed applications (a) shall be deemed to be interruptions caused by a party other than the utility, its employees, agents, or contractors, and (b) are not controllable or exacerbated in scope or duration by the condition of ComEd's system or personnel. Such interruptions will be excluded from data and metrics relating to interruptions, except where data relating to interruptions caused by third parties are expressly required to be included.

Operational Support

ComEd will provide appropriate engineering and operational services to maintain the Test Bed as well as to review and qualify proposals submitted by Applicants. If requested, ComEd will provide evaluation services for Test Bed Applicants at the expense of the Applicant. ComEd may also outsource one or more of the evaluation activities to independent technical research groups such as Argonne National Laboratory, the Electric Power Research Institute (EPRI), Georgia Tech's National Electric Energy Testing Research and Applications Center (NEETRAC) and Underwriter's Laboratories (UL) or universities such as the University of Illinois and the Illinois Institute of Technology (IIT) in which case the cost of these contractors will be solely borne by the Applicant.

Smart Grid Test Bed Compensation

ComEd will charge fees to the users of the Test Bed for any services provided by ComEd pertaining to the deployment of Smart Grid applications within the location of the Test Bed, to the extent that the costs of the Test Bed and the user's Application are not fully recovered through delivery rates. The fee structure for use of the Test Bed and the administration costs are provided in this Plan.

Proposed Test Bed Location

Test Bed Location

ComEd designates the Innovation Corridor as the Test Bed location. The Innovation Corridor consists of portions or all of nine municipalities (Bellwood, Berwyn, Broadview, Forest Park, Hillside, Maywood, Melrose Park, Oak Park and River Forest) and a portion of the City of Chicago, specifically the Humboldt Park area. With the exception of the Humboldt Park area, this Test Bed location encompasses a contiguous footprint that maintains characteristics demographics similar to the entire ComEd system and includes a diverse demand mix of residential, commercial and industrial customers.

In ComEd's sole discretion, if an Application is proposed that is better suited to an alternate location on the ComEd distribution system, ComEd may designate an alternate location that ComEd finds to be appropriate as an additional Test Bed location solely for that Application.

Innovation Corridor Technologies and Voltage Connections

The Innovation Corridor currently employs a cyber-secure 900MHz mesh radio system and cellular communications network (primarily currently used for AMI backhaul communications) that provides the ability for secure encrypted two-way communications. It also includes fiber-optic communication installations, approximately 128,000 Smart Meters installed at residential, commercial and industrial customer locations, an implementation of In-Home Devices with energy usage and pricing notification to customers, and various Distribution Automation equipment. Subject to

limitations imposed by security and privacy needs, details are available from ComEd as required by potential Applicants. The Innovation Corridor also has multiple levels of "source" voltage available to connect various technology applications and provides the opportunity for the demonstration of distribution, transmission, and substation Smart Grid applications. Additionally, the Test Bed has the ability to receive live signals from PJM Interconnection LLC.

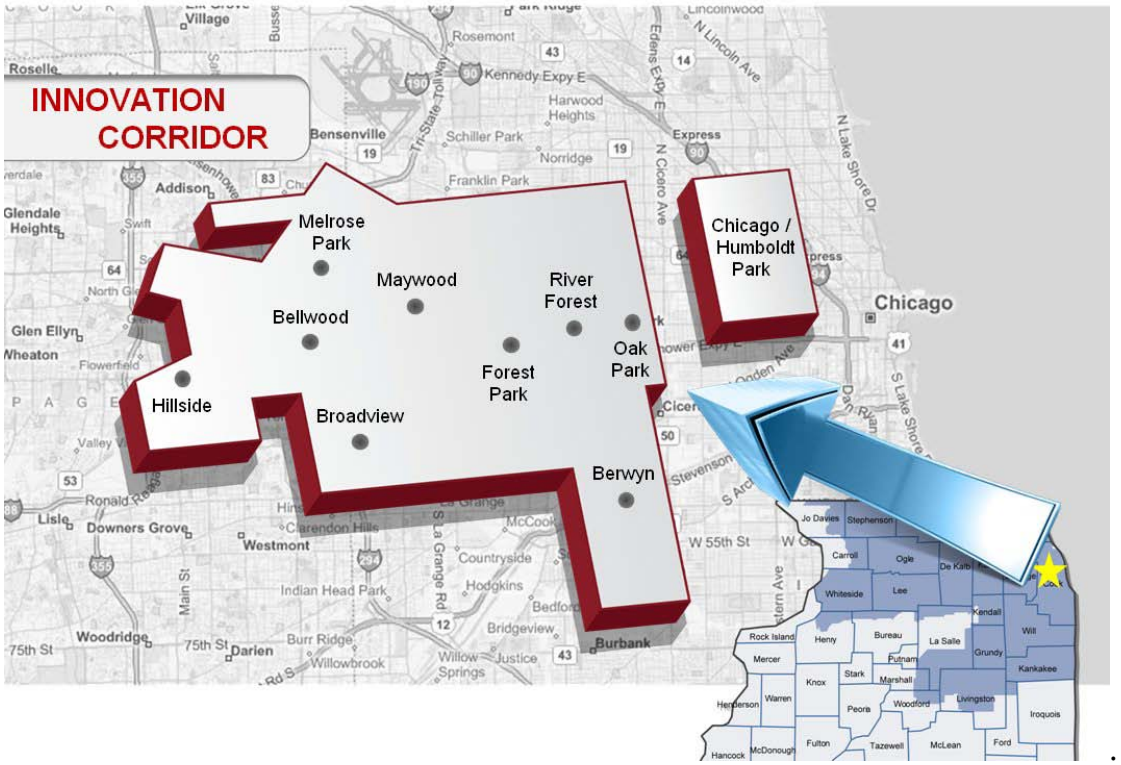

Figure 1. ComEd Test Bed Location

A more detailed map is available from ComEd as required by potential Applicants.

Receiving, Reviewing and Qualifying Smart Grid Test Bed Proposals

This section details the process for receiving, reviewing and qualifying proposals received from Applicants for the Test Bed. Approval for use of the Test Bed is a two-stage process. Stage one requires an Applicant to submit a complete Test Bed application and non-refundable deposit. Once ComEd has determined the submitted application is complete, the Applicant will be provided log-in information to a web-based tool, which starts stage two of the application process. Stage two will provide ComEd additional detailed information regarding the specific Smart Grid application to be demonstrated in the Test Bed. ComEd retains the right to reject an Applicant's proposal if ComEd judges, in its sole discretion, that it could threaten the reliability, safety, performance, security, or operations of ComEd's grid or other utility systems, or the security or privacy of customer-identifiable data. ComEd also retains the right to reject or postpone the consideration of any application due to the number of Smart Grid applications, or to the number of Participants using the Test Bed or the cumulative impact of the pre-existing applications.

Receiving Smart Grid Test Bed Proposals

The Test Bed is available to provide an open, unbiased opportunity for demonstrating potential Smart Grid applications. Any proposed Smart Grid application must conform, at a minimum, to the applicable national standardizing group(s) that apply to the Applicants Smart Grid application, including, but not limited to, American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM),

Institute of Electrical and Electronics Engineers (IEEE), American Wood Preservers' Association (AWPA), the National Electrical Safety Code (NESC) and Underwriters Laboratories (UL) ***before*** any installation related to the Smart Grid application will be allowed to be installed on the ComEd distribution system or interact with other ComEd systems. Appendix A provides the *"Test Bed Application"* ("Application") for requesting use of the Test Bed relating to the deployment of Smart Grid applications to be installed *"on the grid"*.

Reviewing Smart Grid Test Bed Proposals

ComEd will review the stage one application forms for clarity and completeness. After the Applicant's application is determined to be complete and the application fee has been received, the Applicant will be sent information electronically allowing the Applicant access to a web-based application that will, in turn, allow the Applicant to supply the stage two detailed information regarding the Smart Grid application that the Applicant proposes to demonstrate in the Test Bed.

Once the stage two detailed information has been received, the Smart Grid Test Bed Coordinator will initiate the formal evaluation and qualification process for the Applicant's proposal. This process will include an assessment of whether the proposal meets the qualification criteria required for grid connection of Applicant equipment. If ComEd, in its sole discretion, concludes that the Applicant's device does not meet the qualification criteria required for grid connection, ComEd will reject the Applicant's application and will explain to the Applicant the reasons for rejecting the application. ComEd's conclusion will be reached independently, based solely on the judgment, from a review of the application performed by the applicable ComEd organizations listed in

the Engineering and Operations Support section of this Plan, exercised through the processes outlined here and will be reached, as with discretionary determinations relating to delivery services, in a commercially non-discriminatory manner. The purposes of ComEd's explanation of an adverse determination are to promote transparency and to potentially assist both the Applicant in revising its Application for resubmission and other Applicants in crafting their Applications. This explanation shall not be the basis of any claim for "review" of ComEd's determination, which is made in ComEd's sole discretion.

Additionally, as part of this review process, some Applicants may be requested to refer their Smart Grid applications to third party entities such as universities, Underwriters Laboratories, or EPRI to have their devices pre-vetted prior to ComEd agreeing to allow the device to be connected in the Smart Grid Test Bed.

Qualifying Smart Grid Test Bed Proposals

ComEd will use evaluation criteria to determine the feasibility of the Application for "on-grid" implementation. The qualification criteria that will be used to evaluate the Applicant's stage two detailed information is discussed in the following section of this ComEd Smart Grid Test Bed Plan. Following review of the Applicant's stage two detailed information, the Applicant will be notified in writing of the acceptance or rejection of the Smart Grid application to be demonstrated in the Test Bed.

Criteria Used to Qualify Proposals

This section details the criteria that will be used to qualify the stage two detailed information provided by the Applicant for Smart Grid activities that request the use of the Test Bed. ComEd will provide open and unbiased opportunities for testing innovative Smart Grid activities through the Test Bed. The Test Bed will provide an on-grid location for the testing of potentially innovative Smart Grid-related technologies and services, including those that facilitate that testing of business models or services that help integrate Smart Grid-related technologies into the electric grid. It will also facilitate the testing of business models or services that may help promote new products and services for retail customers and offer opportunities to test and showcase Smart Grid technologies and services, especially those likely to support the economic development goals of the State of Illinois. As with other aspects, the qualification criteria may evolve and be revised, consistent with requirements of the Public Utilities Act, including as a result of input from others, as additional and newer information is obtained, and as ComEd gains experience operating the Test Bed. ComEd at all times reserves the right to revise and supplement the qualification criteria. The Applicant specifically recognizes that these terms and conditions are general and will be supplemented and expanded upon in the Contract.

Smart Grid activities requesting demonstration on ComEd's distribution system must comply with the following criteria:

1. The proposed Smart Grid activity shall not threaten the reliability, safety, security, or operations of ComEd's network, employees or the public. In

applying this criterion, ComEd will, without limitation, assess whether the Application could threaten the reliability, safety, performance, security, or operations of ComEd's grid or other utility systems, or the security or privacy of customer-identifiable data.

2. The proposed application must not jeopardize the integrity of ComEd systems, equipment, or business processes. In applying this criterion, ComEd will, without limitation, assess whether the Application could threaten ComEd's delivery systems or the electric systems of others connected to the ComEd system.

3. All devices to be demonstrated on, or connected in any manner to, ComEd's distribution system, at a minimum, shall comply and be certified compliant with the latest applicable revision of specifications developed by national standards organizations such as, but not limited to the below. ComEd, in its sole discretion, may designate other such standards as are applicable to particular devices:

American National Standards Institute (ANSI)

Institute of Electrical and Electronics Engineers (IEEE)

American Society for Testing and Materials (ASTM)

American Wood Preservers' Association (AWPA)

National Electrical Safety Code (NESC)

National Electrical Manufacturers Association (NEMA)

Underwriters Laboratories (UL), applicable to end-use facilities

National Electrical Code (NEC), applicable to end-use facilities

4. All devices shall provide safe operating clearances per the NESC as then adopted and/or modified by the Illinois Commerce Commission.

5. All devices shall meet the minimum Basic Impulse Level (BIL) rating as detailed in Appendix B.

6. All devices that use remote communication shall comply with the standards of the National Institute of Standards and Technology (NIST) for Smart Grid interoperability that are in effect at the time of the demonstration and shall include open standards and internet protocol to the maximum extent possible consistent with cyber security recommendations.

7. All enclosed outdoor assemblies shall provide a means of padlocking the complete unit.

8. All outdoor assemblies shall be designed to resist corrosion, overheating, wildlife entry, and other threats as appropriate for the location of the equipment.

9. The Applicant shall provide, at a minimum, all final versions of installation and operation instructions and drawings for the device to be demonstrated on the grid before any device to be connected to the grid is activated or otherwise put into operation.

10. The Applicant shall provide the testing and/or certification documentation according to the standards groups (as previously identified in number two above) for the device to be demonstrated on the grid.

11. The Applicant shall, with its application, provide documentation from any regulatory agency pertaining to disposal requirements (other than general waste landfill) applicable to any device (or component thereof) to be installed on the grid including any applicable Material Safety Data Sheets (MSDS) for any proposed Smart Grid application.

12. Any device to be demonstrated on the grid shall have clear and permanent markings on the exterior of the device with all required nameplate marking per the latest revision of ANSI/IEEE standards.

13. A Demonstration Plan and analysis methodology shall be submitted by the Applicant with its application.

14. No device to be demonstrated shall be commercially available at the time of the Application or during the duration of the proposed demonstration. Commercially available does not include use pursuant to other pilots or demonstrations similar in nature and character to that allowed by the Test Bed. In applying this criterion, ComEd will in its sole discretion evaluate whether different versions or models of a product qualify as the same Smart Grid application.

15. No activity of the Applicant shall adversely affect the provision of any utility service to any customer.

16. The Applicant shall meet/agree to Terms and Conditions of an application-specific contract between ComEd and the Applicant.

Additionally, all proposed activity involving any utility facility or system and/or any customer of utility data must comply with the following cybersecurity requirements:

17. All software and firmware shall not change during the on-grid demonstration, except as specifically authorized by ComEd in writing and in advance.

18. The activity shall employ discrete and full separation of any networks (company/customer).

19. Local tamper detection of field devices via FIPS 140-Level 2 shall be used.

20. The activity shall encrypt data in-flight or at rest as needed.

21. The activity shall use a centralized key and certificate management system.

22. The activity shall have the ability to provide non-repudiation for access to all components to system.

23. The activity shall have system monitoring with the ability to log security changes, use of access rights, system changes, system state and

anomalous system behavior on all devices included in the proposed solution.

24. The activity shall have the ability to verify the integrity of data used for automation of physical systems.

25. The activity shall have a Secure/Encrypted management interface.

26. The activity shall have a system that has been developed using the Systems Development Lifecycle (SDLC) methodologies including regular auditable penetration testing by third party testers.

27. The activity shall include Virus and Malware detection systems.

28. The activity shall have the ability to set a standard password policy across the system that matches ComEd password policy (password length, complexity and change frequency) with ability to disable accounts after set amount of invalid logins for set length of time.

29. The activity shall have guaranteed confidentiality.

30. The activity shall have the ability to encrypt data across all wireless methods included in system.

In some cases, not all of the above criteria will be applicable to a particular proposed project. In such case, ComEd will assess each project on a case-by-case basis to determine, in its sole discretion, the applicability of the above criteria.

Applicants may be asked to refer their products to third party entities like Argonne National Laboratory, Underwriters Laboratories (UL), Georgia Tech's National Electric Energy Testing Research and Applications Center (NEETRAC) and the Electric Power Research Institute (EPRI) or academia such as the Illinois Institute of Technology (IIT) and the University of Illinois to have their devices pre-screened, at the expense of the Applicant, prior to ComEd agreeing to allow the device to be connected to the Test Bed.

In addition, Applicants desiring to connect Distributed Generation facilities into the Test Bed site will additionally need to satisfy the ComEd interconnection requirements which can be found on the ComEd website at the following link: https://www.comed.com/sites/customerservice/pages/interconnection_distribution.aspx

Finally, ComEd will review any application which includes an activity that communicates directly with customers or that proposes to (or may be interpreted by customers as proposing to) alter in any way the rates, terms, or conditions under which they receive any service from ComEd to determine, in ComEd's sole discretion, if it complies and is consistent with all requirements of Illinois law, Illinois Commerce Commission rules, and ComEd's tariffs. That review will be conducted at Applicant's expense. ComEd, in its sole discretion, may work with an Applicant to bring an otherwise non-compliant activity into compliance provided that all costs thereof are borne solely by the Applicant.

Smart Grid Test Bed Applicant Demonstration Plan Review and Approval

All Applicants must submit to ComEd for ComEd's review and approval a full and complete Demostration Plan for all Smart Grid applications, and that Application must have been approved prior to any deployment of the Applicant's Smart Grid application,

even if ComEd is not requested to support the evaluation activities of the Applicant's proposed Smart Grid application.

Engineering and Operations Support

This section describes the ComEd engineering and operational support services that will be provided to Applicants for proposed Smart Grid Test Bed programs, technologies, business models, and other Smart Grid-related activities.

ComEd will provide, at the Applicant's expense, the appropriate engineering and professional support services required from multiple organizations including but not limited to distribution, transmission, substation, distribution system operations, reliability, energy efficiency, demand response and dynamic pricing, customer operations, information technology, safety and environmental organizations to support all Applicants as necessary. As necessary, ComEd may outsource one or more of these activities to independent technical research groups such as Georgia Tech's National Electric Energy Testing Research and Applications Center (NEETRAC) or the Electric Power Research Institute (EPRI) at the sole cost of the Applicant.

Physical Connections to ComEd Infrastructure

If an Applicant proposes any Smart Grid application that requires physical connection to the grid or any other ComEd system, ComEd will be required to install and remove the approved Smart Grid application in the Test Bed area at Applicant's expense.

Integration with Third Party Communications Vendors

If an Applicant requires connection to ComEd's field communication systems, the Applicant's Smart Grid application to be demonstrated must utilize standards based on communications protocols. Additionally, if the Applicant's Smart Grid application to be

demonstrated in the Test Bed requires integration with third party communications vendor(s) to establish, validate or maintain connectivity, the Applicant will be responsible for all costs from the communication vendor(s).

ComEd Support as Requested by Test Bed Applicant

ComEd will provide support services for the evaluation of Smart Grid applications to be demonstrated as requested by an Applicant who wants to deploy to the Test Bed their Smart Grid application, at Applicant's expense, based on the costs listed in the following section of this plan.

Customers Required for Applicant Program Demonstration

If an Applicant proposes demonstrating a Smart Grid application that requires ComEd customer participation, the Applicant shall obtain the voluntary agreement of the number of customers from within the Test Bed necessary for the Applicant to successfully demonstrate their application. As necessary, ComEd will work with Applicants to determine what steps are required for customers to participate in the demonstration of the Applicant's Smart Grid application. In applying to use such an Application on the Test Bed, the Applicant will represent and warrant to ComEd that it has obtained the voluntary consent of the applicable customers, and will indemnify ComEd against any and all liabilities resulting from unauthorized or adverse effects on those customers.

Provisioning of Customer Data

ComEd ***will*** ***not*** provide any specific retail customer identifiable information unless every such specified retail customer has provided verifiable consent to ComEd

specifying the particular data that can be released and unless such authorization allows such data to be released to Applicant. ComEd will review, on an individual basis, requests to provide non-identifiable retail customer data to an Applicant. In no event, however, will ComEd release any data which, in ComEd's sole opinion, could threaten the reliability, safety, performance, security, or operations of ComEd's grid or other utility systems, or the security or privacy (except insofar as privacy concerns are expressly waived by the customer, as stated above) of customer-identifiable data.

Ultimate Control of ComEd Smart Grid Test Bed and Other Utility Systems

ComEd retains full and complete control of its distribution system and operations and may reject any Application that, in its sole judgment, could threaten the reliability, safety, security, or operations of its distribution system, or threaten the security and privacy of retail customer-identifiable data.

Estimated Costs to Establish, Administer and Promote Test Bed

This section details the cost of establishing, administering and promoting the Test Bed. ComEd will use the existing New Business cost determination methods when providing Applicants costs for administering and implementing any Smart Grid application.

Estimated Cost to Establish the ComEd Smart Grid Test Bed

ComEd does not anticipate at this time that there will be any material additional cost simply to establish the Test Bed. The Innovation Corridor has already been established and contains the necessary infrastructure to demonstrate additional Smart Grid applications.

Estimated Cost to Administer the Smart Grid Test Bed

ComEd will enter into a contract agreement with all Applicants approved for Smart Grid application demonstration in the Test Bed. The Applicant will be provided the costs, including both applicable direct and indirect costs, to demonstrate the Applicant's Smart Grid application in the Test Bed. Charges will be calculated based on ComEd's actual costs, both direct and indirect. ComEd may base the calculation of such costs on pre-existing ComEd procedures or cost analyses, including ComEd's General Company Order No. 25 (GCO25). GCO25 provides guiding principles for determining ComEd's costs to provide nonstandard services and facilities that are recoverable under ComEd tariffs from the entities causing ComEd to incur such costs, and also memorializes ComEd's costs of providing certain nonstandard services and facilities so as to facilitate

ComEd's ability to estimate the costs of providing nonstandard services and facilities. Costs of other services and facilities will be determined by ComEd in accordance with the estimating practices it employs generally. Costs may include appropriate contingencies as well as the net present value of the incremental costs of investing in and supporting long-lived assets, but will not include any additional adder for profit.

The Applicant will be provided the applicable costs to demonstrate the Applicant's Smart Grid application in the Test Bed. The Applicant must approve of these costs prior to the deployment of the Applicant's Smart Grid application in the Test Bed.

Estimated Cost to Disseminate Information Concerning the ComEd Test Bed

ComEd will provide information about the Test Bed on its website located at www.comed.com. This website will provide any Applicant the ability to download the Application and additional information regarding the review, evaluation and qualification of any proposed Smart Grid applications. Additional information related to the installation of Smart Grid applications will also be available at this website. The costs associated with the development of this web page are expected to be minimal. Any such costs would be recovered through ComEd's delivery rates.

Once the ComEd website is available for Applicants, ComEd will also inform the Smart Grid Industry of its establishment, including through an announcement in an industry trade magazine. The cost associated with this informational announcement is approximately $30,000. ComEd anticipates and will cooperate with additional marketing opportunities for the Test Bed developed by the Smart Grid Advisory Council and the

Illinois Science and Energy Innovation Trust to extent allowed by law and the Test Bed requirements set out in this Plan.

APPENDIX A – Smart Grid Test Bed Application

ComEd's Smart Grid Test Bed

The ComEd Smart Grid Test Bed ("Test Bed") is available to provide an open, unbiased opportunity for testing programs, technologies, business models and other innovative Smart Grid-related technologies and services. This on-grid location will provide the demonstration site for Smart Grid applications specifically for the power distribution grid and help promote new products and services for retail and residential customers. For additional eligibility requirements and details relating to ComEd's Smart Grid Test Bed please see www.comed.com. After ComEd has accepted the Test Bed Application, ComEd will contact the Applicant through written communication via the contact information provided in the submitted application, regarding the steps required for the Applicant to connect to a web-based application that shall be used by the Applicant to provide ComEd with additional detailed information regarding the Applicant's Smart Grid application for demonstration using the ComEd Test Bed.

Smart Grid Test Bed Application Requirements

A completed Application and a non-refundable application fee of $50.00 must be submitted to ComEd to enroll in the Smart Grid Test Bed program. The attached Application form on page 2 of this document must be completed and mailed, e-mailed or faxed to ComEd at the address, e-mail address or fax number noted at the bottom of page 2.

SMART GRID TEST BED APPLICATION FORM

Date: _____

Section 1. Smart Grid Test Bed Applicant's Contact Information:

Name: _____
Mailing Address:_____
City: _____ State: _____ Zip Code: _____
Telephone Number: _____
Facsimile Number: _____
E-Mail Address: _____

Section 2. Description of Smart Grid program, technology, business model, other innovative Smart Grid-related technology or service to be demonstrated in the Test Bed:

_____
_____
_____
_____
_____
_____

Section 3. Description of Applicant's evaluation requirements to be performed by ComEd (if any):

_____
_____
_____
_____
_____
_____

What is the timeframe that will be necessary to demonstrate your Smart Grid program, technology, business model, other innovative Smart Grid-related technology ?

_____

Mail the $50 Application Fee and Mail or email the Application to:
Commonwealth Edison Company
Smart Grid Test Bed
Three Lincoln Center, 4th Floor
Oakbrook Terrace, IL 60181-4260
e-mail: smartgridtestbed@comed.com

Or Fax the application to:
Fax: (630) 576-6356

Applicant Notification for the ComEd Smart Grid Test Bed

Date: _____

This document provides the ComEd Smart Grid Test Bed Applicant with the required notification for demonstrating the Smart Grid application on the ComEd distribution network.

Smart Grid Test Bed Applicant:

Name: _____
Mailing Address:_____
City: _____ State: _____ Zip Code: _____
Telephone Number: _____
E-Mail Address: _____

Description of Smart Grid program, technology, business model, other innovative Smart Grid-related technology or service to be demonstrated in the ComEd Test Bed:

_____
_____
_____
_____

The Smart Grid Test Bed Applicant and the specific Smart Grid program, technology, business model, other innovative Smart Grid-related technology or service to be demonstrated in the ComEd Test Bed listed above has been:

- ☐ Approved
- ☐ Rejected

ComEd Test Bed Demonstration Coordinator:

Name: _____
Title:_____
Mailing Address:_____
City: _____ State: _____ Zip Code: _____
Telephone Number: _____
E-Mail Address: _____

APPENDIX B – Minimum Basic Impulse Level (BIL) Ratings Based on Voltage Level

The below table indicates the MAXIMUM design voltage level for devices on the grid and the required MINIMUM Basic Impulse Level (BIL) for the associated MAXIMUM design voltages.

ComEd Nominal Voltage (kV) Phase-to-Phase	Maximum Design Voltage (kV)	Minimum Basic Impulse Level (kV)
4	8.3	95
12	15.5	110
34.5	38	200
138	145	650