STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

COMMONWEALTH EDISON COMPANY	)	
	)	**Docket No. 12-0298**
Petition for Statutory Approval of a Smart Grid Advanced Metering Infrastructure Deployment Plan pursuant to Section 16-108.6 of the Public Utilities Act	)	

DIRECT TESTIMONY OF MIRIAM HORN ON BEHALF OF THE CITIZENS UTILITY BOARD AND THE ENVIRONMENTAL LAW AND POLICY CENTER

CUB/ELPC Exhibit 1.0

May 11, 2012

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I. INTRODUCTION AND SUMMARY OF CONCLUSIONS

Q. Please state your name and business address.

A. My name is Miriam Horn and my business address is 257 Park Avenue South, New York, New York 10010.

Q. By whom are you employed and in what capacity?

A. I am employed by the Environmental Defense Fund ("EDF") as Director of EDF's Smart Grid Initiative. EDF is a non-profit organization whose mission is to preserve the natural systems on which all life depends. Guided by science and economics, EDF strives to find practical and lasting solutions to the most serious environmental problems. My team and I work with key stakeholders to set specific environmental performance criteria for smart grid deployment and develop regulatory reforms and new electric sector business models to create market opportunities for entrepreneurs with innovative energy technologies and services and transform traditionally conservative utilities into agents of change.

Beyond Illinois, we are currently working with utilities and key stakeholders to design smart grid deployments and reform market rules in several other states and in the regional and federal context. In Texas, EDF is a founding partner of the Pecan Street Project, the nation's most comprehensive smart grid pilot project, where we have been deeply involved in the design of Austin's future energy system and the intensive analysis of those elements that have already gone online. In addition, our Texas work includes efforts to change market rules to allow more access to electric markets from distributed resources such as demand response and distributed renewable energy. In Austin we have been working with the utility for several years to meet aggressive energy efficiency and renewable energy goals

established in their long-term plan, and our work currently includes helping them implement an innovative "Value of Solar" rate that compensates distributed solar installations at a level that includes their value in offsetting grid management and infrastructure costs in addition to the conventional avoided cost approach. My team has also brought performance-based ratemaking to Duke's service territory in North Carolina, through our work to make the Save-a-Watt program a reality. Finally, in California, where IOUs statewide are obligated to deploy smart grid technology under a 2009 statute, EDF substantially influenced the Public Service Commission's planning requirements; designed an Evaluation Framework for Smart Grid Deployment Plans that shaped the Commission's review of the utilities' plans; and has been tasked by the Commission to work with utilities and other stakeholders to develop stronger metrics for smart grid success. In addition, EDF has been involved in transmission planning and/or market design in the CAISO, ERCOT, PJM and MISO regions, and has contributed to proceedings relevant to the adoption of advanced grid technology and the integration of intermittent renewables at the Federal Energy Regulatory Commission ("FERC").

Q. Please describe your education and relevant work experience.

A. Before joining EDF, I worked for the U.S. Forest Service and was a writer for several national publications, including The New York Times and The New Republic. I currently serve on the advisory board for the Galvin Electricity Initiative and Gridweek. With EDF President Fred Krupp, I co-authored the New York Times bestseller *Earth: The Sequel, The Race to Reinvent Energy and Stop Global Warming (*Norton, 2008). Chosen a "best book of the year" by Fast Company, the book was the basis for a Discovery Channel documentary. I have also

contributed to a forthcoming book from CRC Press: *Smart Grids: Infrastructure, Technology and Solutions*, edited by Stuart Borlase at Siemens Energy. I have a bachelor's degree from Harvard University and studied Environmental Science at Columbia University. My biography is attached to this testimony as CUB/ELPC Exhibit 1.1.

Q. In what capacity are you testifying in this proceeding?

A. I am testifying as a witness for the Citizens Utility Board ("CUB") and the Environmental Law and Policy Center ("ELPC"), because CUB, ELPC and EDF share a common goal: to maximize the consumer and environmental benefits from the deployment of new energy infrastructure, such as the investments that Commonwealth Edison Company ("ComEd") described in its proposed Smart Grid Advanced Metering Infrastructure Deployment Plan ("AMI Plan"), filed on April 23, 2012 with the Illinois Commerce Commission ("ICC" or "the Commission").

Q. What have you reviewed?

A. I've reviewed the testimony filed by ComEd in this case, including ComEd's AMI Plan and ComEd's AMI Cost/Benefit Analysis, including *Assessing the Customer-Related Benefits Associated with ComEd's AMI Plan and Residential PTR*, ComEd Ex. 5.02, and *Cost and Benefit Analysis of Commonwealth Edison (ComEd) Smart Grid Advanced Metering Infrastructure Deployment Plan (AMI Plan)*, ComEd Ex. 6.02; the Illinois Smart Grid Collaborative ("ISGC") Final Report; the evaluations of ComEd's AMI Pilot by Black & Veatch and the Electric Power Research Institute ("EPRI"); the Illinois Smart Grid Advisory Council's *Initial Guidance Regarding a Successful AMI Plan to Ameren Illinois and Commonwealth Edison*; and evaluations and planning materials related to smart grid deployments in other jurisdictions.

Q. Why does EDF, a non-profit organization, regard smart grid deployment as a policy priority?

A. In the coming decades, the U.S. electric industry is poised to invest trillions of dollars in technology that will transform our electric system from the 19th century network we have been living with for as long as anyone can remember to a 21st century network with radically different capabilities. Those investments have the power to transform the way we generate and consume electricity – and as the U.S. electric industry is the world's single largest source of greenhouse gas pollution, we view such a transformation as an essential part of any serious strategy to prevent catastrophic global warming.

Fundamentally, the smart grid is an enabler. Flexible demand, storage and grid awareness technologies can enable the interconnection of far more variable renewable generation and can make it possible to charge plug-in electric vehicles ("EVs") without compromising grid stability. As such, it can facilitate the emergence of a fundamentally different kind of electric system – one that is structured around distributed resources, including variable renewables; one with far more small players than we have ever seen; and one that is deeply integrated with transportation.

However, as powerful as smart grid technology may be, smart grid investments will not necessarily enable this radical transformation of the electric system. It is unlikely to occur by accident. Unless smart grid investments are intentionally planned with attention to what is possible – a low-carbon, efficient, flexible, reliable, cost-effective, clean energy system that is open to innovations and participation by completely new types of market actors – that is unlikely to be what will be built. Instead, technology aimed primarily at incremental operational

improvements could carry the day. Hence, EDF's involvement: We are engaged in smart grid because we think excellent smart grid policy is essential to the emergence of a clean energy system.

Q. How can this smart grid of investment support broader Illinois energy policy?

A. Effective smart grid investments help move electricity consumers from passive takers to active market players. By changing this paradigm, it allows consumers at both the residential as well as commercial/industrial level to make informed choices that best meet their own economic requirements and have efficient system-level consequences.

As I stated above, smart grid enables the deployment and optimization of investments in a number of innovative technologies. Specific to Illinois, the smart grid will both support and amplify the benefits of both the Renewable and Energy Efficiency Portfolio Standards by allowing for greater transparency and interoperability into the system. Smart grid makes investments in both of these important areas more successful and cost-effective.

The significance of these effects in Illinois is even greater due to the significant wind and solar resources on the generation side of the system, and the relatively older building stock and manufacturing focus on the load side. It will be vital for Illinois to consider these potential benefits when determining the total smart grid opportunity for the state.

Q. What is your conclusion?

A. ComEd's AMI Plan represents a strong initial document from which to build towards a successful deployment. Based on EDF's extensive experience evaluating smart grid deployment plans in other jurisdictions (as further discussed below) and also

reviewing the Energy Infrastructure Modernization Act ("EIMA"), we are satisfied that ComEd's plan has the fundamentals to facilitate a successful smart grid roll-out that would benefit the people of Illinois and also have positive economic and environmental impact on the service territory, state and region.

Key elements on which ComEd has performed commendably in this initial effort include:

- Vision Statement. ComEd's vision statement[1] calls out the benefits of the AMI roll-out; is clear and specific; and discusses direct benefits to customers, including faster outage response and fewer estimated bills. Moreover, the vision is reinforced throughout the document; for example, chapter 3 explains how the AMI "will benefit customers by enabling specific functionalities of the smart grid that were previously unavailable."[2]

- Roadmap. The plan provides a "roadmap," clearly describing the steps ComEd will take from launch, through deployment, well-designed customer education, customer service, etc. The document provides the planned steps to roll out the meters over the next decade.

- Operational Deployment. The section on deployment[3] discusses not only the specific steps that need to be taken to deploy the meters and the smart grid system, but also touches on the need for information technology and business processes to be developed for the "most efficient and effective use of the AMI solution." This portion of the document is very comprehensive and thorough, providing detail on costs and roll-out timing.

- Customer Applications. The Customer Applications section[4] explains how the AMI system will benefit customers by enabling functionalities. Here the document lays out specific customer benefits from AMI and smart grid. For example, the plan explains data collection, energy monitoring, and "the Smart Home Vision." (This is also the section where electric vehicles are addressed, albeit not with the necessary level of detail, as further discussed below. The distributed generation section of the document is also not as strong we would like.)

[1] ComEd AMI Plan, page 3.

[2] ComEd AMI Plan, page 47.

[3] ComEd AMI Plan, page 13.

[4] ComEd AMI Plan, page 47.

- New Technologies. The need to ensure interoperability with emerging technologies is addressed in several places in the document.[5]

We are also favorably impressed with certain operational aspects of the plan, which are far-sighted in their design. ComEd's planned "test bed"[6] will afford the utility with significant, strategically designed learning opportunities. Meanwhile, the plan's specific commitment to interoperability is, in our view, conducive of developing a "future-proofed" system and thus key to its success in a rapidly evolving technological environment.

Notwithstanding the foregoing, however, as discussed below, a number of portions of ComEd's plan can and should be improved to secure initial approval. The plan should be continually improved by the utility for annual review by the Commission, the Smart Grid Advisory Council and other stakeholders throughout deployment and thereafter, as technology, demands on the system, and the body of knowledge about the new world of the smart grid continue to grow and evolve.

I believe, based on my experience working with other major utilities across the country, that an AMI deployment plan such as this one is only a first step. It is vital that ComEd continue to work in a collaborative fashion to improve this plan, and also continue to revisit it and the broader smart grid strategy on an ongoing basis.

II. HOW GREATER BENEFITS MAY BE ACHIEVABLE, SOONER

Q. What benefits would you recommend the Commission consider as it examines ComEd's proposed plan?

[5] *See, e.g.,* ComEd AMI Plan, page 18.

[6] ComEd AMI Plan, pages 74-75.

A. The smart grid, and in particular, the types of investments identified in the EIMA, can provide great potential benefits for ComEd's customers, but only if designed with clear goals, system-wide planning and opportunities for continuous learning and improvement. Potential benefits include:

- Improvements in operational efficiency and system reliability, including reduced metering costs through automated metering and improved asset life through improved information on maintenance issues in wires or in substations, before equipment failures or outages occur.

- Consumer benefits through improved usage information and ability to manage energy usage through energy efficiency, demand response and distributed generation investments, not only through expanded rate options that will give additional potential money saving opportunities from energy conservation and load shifting but through new technologies made practicable by smart grid investments.

- Economic benefits through the support of new markets and innovation that leverage the infrastructure. Smart grid, and the data that results from its implementation, can create significant opportunities for innovation if the right rules put in place to optimize access and functionality.

- Environmental benefits through smarter long-term generation and transmission investments and more efficient resource utilization, avoided greenhouse gas ("GHG") emissions associated with peak energy usage and meter reading, and improved distributed and renewable resource interconnection.

A well-designed smart-grid deployment can achieve enormous environmental benefits. Its near-term benefits are especially important to regions like the Midwest, with extensive legacy coal fleets under pressure from new federal clean air regulations. Investments in grid modernization provide utilities with more flexibility and more options for compliance with U.S. Environmental Protection Agency ("EPA") regulations relating to toxic air pollution – at low cost and without compromising reliability – by enabling far greater reliance on distributed and demand-side resources, increasing opportunities to make full use of the region's

cheap, plentiful wind power, and directly managing reliability through smart systems rather than redundancy. Ultimately, grid modernization will upend the century-old paradigm that requires supply to follow demand; with an intelligent network end to end, load will "follow" the availability of clean, cheap generation.

Q. Are these benefits included in the cost/benefit analysis described within the EIMA?

A. Yes, they are. The statute makes express mention of benefits like avoided electricity costs (including avoided operational costs); avoided consumer power, capacity, and energy costs; avoided societal costs from producing and consuming electricity; greater integration of renewable and distributed generation; reduction in emissions and related health-costs; and benefits associated with energy efficiency, demand response and integration of electric vehicles.[7]

Q. Is ComEd's AMI Plan cost-beneficial based on the definition in the EIMA?

A. Yes, our review of ComEd's cost-benefit analyses suggests that the plan is indeed cost-beneficial. However, those analyses are incomplete in their quantitative accounting of smart grid *benefits* in important respects; for example, avoided generation costs and emissions, while referenced, are not quantified. The absence of attention to these factors in the cost-benefit analysis will hamper this Commission's efforts to evaluate various smart grid options in the future, since it will have no means to judge which path will deliver the least-cost reductions in harmful air pollution and other impacts. It is also our understanding that ComEd has agreed to adopt a fuller range of tracking mechanisms, or trackers, which will also require quantification of environmental and other benefits for the Commission to evaluate whether the deployment is meeting expectations along those dimensions.

[7] 220 ILCS 5/16-108.6(a).

Q. Are there additions to ComEd's AMI Plan that would make it more likely to result in the benefits that ComEd claims?

A. Yes. The ComEd AMI Plan would be more likely to succeed in achieving the projected benefits if more innovative rate options were included. Although real-time pricing is contemplated, research to date is inconclusive as to what rate structures best achieve customer acceptance and customer and system benefits. To ensure that customer and system benefits are maximized, other dynamic rate structures, such as Time Of Use ("TOU") pricing, should be included in the rollout.

Q. Why is a full menu of dynamic pricing options important to deliver benefits to ComEd's customers?

A. A full menu of dynamic pricing options, including rate structures like a TOU, allows for customers to choose the rate structure which best fits their needs and maximizes their service experience with the utility. A full menu also increases the likelihood that any one customer will participate in dynamic pricing, since customers have the ability to change their behavior in ways most conducive to their own consumption needs and habits.

Q. How should a full menu of dynamic pricing options be incorporated into ComEd's AMI Plan?

A. As written, ComEd's AMI Plan addresses the marketing required to have successful dynamic pricing programs (Page 41); the web-portal functionality required for customers to take advantage of dynamic pricing (Page 50); the interplay with distributed generation (Page 68); the interplay with storage (Page 71); and metrics related to dynamic pricing (Page 75). ComEd's AMI Plan should include a commitment to offer dynamic pricing options beyond those statutorily required. I do not recommend a specific structure or tariff because ComEd should explore the

benefits and costs associated with particular pricing programs through a collaborative stakeholder process such as the Smart Grid Advisory Council.

Q. Are there other areas where ComEd's AMI Plan could include more detail?

A. Yes. In addition to dynamic pricing, the Plan's treatment of demand management technology, distributed generation, and electric vehicles is incomplete. For example, with respect to electric vehicles – which demand smart grid technology so that they can be leveraged as assets (flexible load), rather than simply multiplying the burdens on an already-creaking system – the utility's plan should describe, with some specificity, how it will facilitate public and private charging, the tariffs it plans for charging, and how it will use distribution automation to manage the destabilizing effects of dense electric vehicle deployments.

Q. Does the Plan as formulated deliver benefits to Illinois ratepayers in an appropriate timeframe?

A. Not entirely. The ten-year horizon raises questions of equity, imposing on customers the shared cost of smart grid investments without the ability to make use of its functionality for a decade. While some benefits of AMI deployment will accrue to customers over a large area, others will accrue primarily to those customers who actually have the new meters. Therefore, we strongly recommend that efforts be made to close the gap between when individual ratepayers begin paying for the new system infrastructure, and when they themselves will have direct access to the new technology and the information it provides. It's my understanding that the Smart Grid Advisory Council has recommended that deployment of Smart Grid investments, including AMI, should be de done in the shortest reasonable period that maximizes its value to customers and which meets any statutory cost tests.

In addition, even for those customers who are among the first to receive the

new meters, the AMI could be expected to deliver greater benefits to utility customers, in a shorter timeframe, if the utility did more to empower customers.

In Section D of its Plan, ComEd proposes to make itself the arbiter of whether certain new energy applications are viable and should be made available to customers. This will mean, necessarily, the erection of barriers to the entry of new technologies and services, delaying and diminishing the value proposition for customers. In our view, ComEd's customers would be better served by ComEd taking on the role of "market enabler," rather than "gatekeeper."

ComEd's AMI Plan also lacks the requisite elements to ensure that customers can access their own usage data, preferably directly from the meter, in real time, and share it with authorized third parties. While industry practice increasingly favors providing consumers immediate access to meter data upon installation, ComEd's AMI Plan makes no such provision, nor does it make reference to any system which would allow consumers to give third parties robust access to continuous data. This could significantly delay consumers' opportunities to put their own data (which they generate through their own energy use and management), to use for their own benefit – if they ever could.

III. CREATING THE NECESSARY ECOSYSTEM TO SUPPORT ADDITIONAL TECHNOLOGIES

Q. ComEd's AMI Plan describes several customer and grid benefits of distributed generation at pages 66-69. Do you agree that distributed generation brings customer benefits?

A. Yes, I do.

Q. Will ComEd's AMI Plan alone ensure that customers realize these benefits?

A. No. There are other barriers to widespread customer adoption of distributed generation. Some of these barriers are economic, such as lack of good financing options to address the high up-front cost of renewable energy systems. Other barriers are technical, such as the level of study required to connect distributed generation to dense, urban areas and the lack of information about suitable interconnection sites.

Q. Can you explain the first technical barrier: the level of study required?

A. As I understand, Illinois has a set of interconnection rules that were adopted through a Commission rulemaking process. As a part of those rules, different levels of review are required for interconnection to ComEd's distribution grid based on the generating capacity of the customer's system and the location on ComEd's system (that is, whether on a radial feeder or a network grid) to which the customer wants to connect to. For interconnection requests on the portion of ComEd's system referred to as a network grid, interconnection requests are automatically sent to a higher level of study. If a customer falls into the higher levels of review, approval of their request to connect to ComEd's grid can require an expensive and time-consuming study – even if the system is small is size and the same study was already performed for similarly situated customers.

Q. Why is the higher level of study a problem for distributed generation?

A. The reliability of ComEd's grid is certainly very important, but a de facto policy requiring any sized system on the network grid to go through a time-consuming, unpredictable and potentially expensive process could derail most projects on the network grid, and definitely smaller systems such as residential and small commercial rooftop systems. Additionally, requiring repeated studies of similarly

situated interconnection requests seems to discourage adoption of distributed generation in those dense, urban areas on the network grid without serving the end goal of reliability.

Q. **What should the Commission do to address this technical barrier?**

A. One approach might be to re-open the rulemaking process for interconnection rules with a goal of incorporating well-developed best practices for streamlining approval and interconnection processes. At the very least, the customer should be given the option to pay for the incremental level of study required to address the effect of interconnection at their particular location on system reliability instead of paying for a completely new study to be performed.

Q. Can you explain the second technical barrier: the lack of information about suitable interconnection sites?

A. Yes. Distributed generation may be cost-effective for customers in some places on ComEd's grid and in other places it may not be. Currently there is no way for a customer to know whether they are in a good location for a distributed generation project without first evaluating a project, contacting a vendor, preparing an interconnection application, filing that application with ComEd and waiting for a response. Again, my concern is that all of these steps can involve substantial time and resources, which can ultimately have the effect of discouraging customer adoption of distributed generation.

Q. How could ComEd address this problem?

A. ComEd could publish information about its distribution grid on its website, which would allow customers to discover, at least, where the radial grid ends and where the network grid begins. Further, ComEd could publish information on customer areas served by feeders that have already reached the threshold of distributed

generation capacity necessitating a higher level of study. This would save resources for both ComEd and for its customers, reduce risk for distributed generation developers in site selection, substantially reduce the barriers to interconnection, and help further enable the type of customer and grid benefits of DG that ComEd describes in its AMI Plan.

Q. Have other utilities taken the steps that you're describing?

A. Yes. Several utilities have published interactive distribution grid maps that provide customers with information that they can use to perform and initial screening of the best places to interconnect distributed generation. For example, San Diego Gas and Electric has established a website with its map[8] and National Grid in New England has done the same.[9]

Q. What should the Commission do to address this barrier?

A. If the Commission approves ComEd's AMI Plan it should clearly state its expectation for ComEd to reevaluate and phase-out its external disconnect switch requirements, as many other utilities have done throughout the country.

Q. What is your conclusion on distributed generation?

A. The environmental and economic benefits of distributed generation described in ComEd's AMI Plan can be fully realized if ComEd and the Commission commit to removing technical barriers that customers face in the interconnection process. Without addressing these barriers, it is premature for ComEd to claim that its AMI plan will result in benefits from greater integration of distributed generation resources.

[8] *See* http://sdge.com/interconnection-information-and-map

[9] http://www.nationalgridus.com/niagaramohawk/home/energyeff/4_networkmap.asp

IV. HOW MEASUREMENT AND TRACKING COULD BE ENHANCED

Q. What do you think is important to consider when setting annual milestones and metrics related to smart grid functions?

A. Without clearly defined milestones and metrics, investment in smart grid infrastructure may overemphasize expenditure amounts as opposed to performance outcomes. These milestones and metrics should measure how smart grid functionalities are delivered to ComEd consumers. It's my understanding that the ICC directed ComEd to consider additional tracking metrics, or trackers, in this AMI Plan filing.

Q: Do you think that the trackers that were included in ComEd's AMI Plan are sufficient to accurately measure the impact of the smart grid deployment?

A: Not as they are currently written. The trackers that were included fail effectively to quantify some important potential impacts and benefits of a smart grid deployment, such as air emissions reductions. In addition, thanks to network effects that arise from the deployment of a smart grid, the aggregate of smart grid benefits is greater than the sum of the system's parts – yet the proposed trackers fail to provide a holistic perspective on smart grid implementation.

Q. What can be done to enhance the milestones and metrics in ComEd's AMI Plan?

A. EDF has been a leader in the identification and development of key trackers for smart grid deployment. Leveraging our experience in California, where we were asked by the California Public Utility Commission ("CPUC") to lead the development of a set of key metrics in collaboration with the investor-owned utilities, we formulated a list of key trackers that can be used to effectively measure the impact of smart grid investments across all four key areas described earlier. In developing

these trackers, it was clear that any useful tracker must (1) provide reasonable methods for the measurement and reporting of criteria to be pursued and (2) sufficiently enable stakeholders to evaluate the future effectiveness of the smart grid deployment at reasonable intervals.[10] The results include a list of consensus metrics – those agreed to by all the parties in the proceeding and adopted by the CPUC – and additional metrics asserted by EDF, now being negotiated in a workshop established on directive of the CPUC.

Q: What are the categories of trackers that you would recommend?

A: In general, trackers should focus on measuring the three major areas of benefits that can be derived from a strong smart grid deployment: economic, environmental and reliability.

Q: Do you have a recommended list of those trackers?

A: EDF has worked with utilities across the country to develop effective trackers, and techniques for quantifying difficult-to-measure attributes. Based on our extensive experience developing trackers in other jurisdictions and our review of ComEd's AMI Plan, we recommend the trackers appended as Ex. 1.2 to my testimony. It's my understanding that ComEd has reviewed these as well, and will adopt these additional trackers.

Q: Are these the only trackers necessary for success?

A: No. This is a good starting point. As we have seen in other jurisdictions, developing good trackers is an on-going and collaborative process. EDF has been asked by regulators to convene stakeholder engagement processes to identify additional

[10] Herter, O'Connor, Navarro, *Evaluation Framework for Smart Grid Deployment Plans: A Systematic Approach for Assessing Plans to Benefit Customers and the Environment* (June 2011), available at http://www.edf.org/sites/default/files/smart-grid-evaluation-framework.pdf

trackers, and also to support the development of the systems and processes that can be used to actually capture the information that is used for the trackers.

EDF continues to be a leader, working collaboratively with the IOU's in many locations to continue to improve both the deployment plan and the associated trackers. This process has led to deployments with increased impact from both an economic and environmental perspective.

V. APPROVAL OF COMED'S AMI

Q. After reviewing ComEd's AMI Plan, what is your recommendation to the ICC?

A. I believe that modifications should be made to improve the Plan, and that, subject to those modifications, the Plan should be approved. The modifications that I would regard as necessary include, at a minimum:

- While we support a deployment done at a pace that can be managed effectively in order to avoid sub-optimal implementation, the misalignment of cost allocation – to all ratepayers on day 1 – and benefits – accruing to some ratepayers right away, while others must wait a decade – is inequitable, and must be addressed.

- Complete, continuous usage data should be made available to customers, and to their approved third parties, promptly upon installation of advanced meters.

- ComEd should in no way act as a gatekeeper to innovation by limiting customers' access to applications developed by third parties.

- A fuller set of trackers, measuring such important smart grid benefits as reduced air emission impacts and increased demand response participation, should be adopted. Specifically, the Plan should be modified to include the trackers included in CUB/ELPC Ex. 1.2 to this testimony. My understanding is that ComEd is amenable to modifying its Plan to include the use of these trackers.

- The menu of dynamic rates available to consumers should be expanded beyond the current offering (solely real-time pricing), to include other rate designs, such as Time Of Use Pricing.

Moreover, the Plan, even as so modified, should not be understood to be complete and sufficient for the life of the AMI deployment. Smart grid deployment and its resulting benefits is an area of evolving interest – one where changing technology, market characteristics, regulatory requirements, emerging applications and locally unique conditions will continue to shape the landscape in real time. Therefore, the approval of this plan should be seen as the beginning, not the end, of the Commission's involvement and interest in ComEd's smart grid deployment. I recommend that the Commission institute annual reviews, and establish stakeholder processes for continuing to develop and refine trackers for smart grid functions as the salience of the various functions, and the particular challenges relevant in ComEd's service territory, becomes clear over time. I understand that the Smart Grid Advisory Council is prepared to manage this ongoing process.

Q. Does this conclude your direct testimony?

A. Yes, it does.