

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

## **APPENDIX A – REPORTS**

## **I. INTRODUCTION**

Pursuant to the June 2012 Order, ComEd was directed to submit information with its Annual Implementation Progress Report (“AIPR”) concerning any updates since the submission of the AMI Plan to standards identified by the National Institute of Standards and Technology (“NIST”), including standards adopted by NIST’s Smart Grid Interoperability Panel (“SGIP”), and how ComEd is addressing them.<sup>44</sup> In addition, in that same June 2012 Order, the Commission also directed ComEd to address in its 2013 AIPR: (1) if a Time-of-Use (“TOU”) tariff will be proposed and the results of the dialogue with stakeholders regarding same; and (2) the development of a methodology to define and identify vulnerable customers and issues related to tracking information for vulnerable customers. ComEd did so, and in the order entered approving ComEd’s 2013 AIPR, the Commission decided that any further discussion of these two issues was outside the scope of an AIPR proceeding.<sup>45</sup> Thus, while the TOU and potentially vulnerable customers are not issues in any proceeding that may be opened by the Commission to review ComEd’s 2016 AIPR, ComEd does present, for informational purposes only, a discussion of its further efforts in 2015 to address these two issues.

Similarly, in the June 2012 Order, the Commission also directed ComEd to work with interested parties to implement a map showing where distributed generation (“DG”) would be good or bad. While the Commission did not specifically direct ComEd to report on the progress of the DG mapping request with its AIPR and specifically indicated that any issues regarding DG mapping should be brought before the Commission in a separate filing or rulemaking, ComEd is reporting on the status of this effort for the convenience of the Commission and all interested parties.

Finally, in the January 28, 2014 within the Order entered in Docket No. 13-0495 regarding ComEd’s energy efficiency plan, the Commission ordered ComEd to propose a Voltage Optimization (“VO”) study and to include it in ComEd’s AMI Plan.<sup>46</sup> In compliance with that Order, a discussion of the proposed study was included in the 2015 AIPR.

A discussion of the status of each item described above is provided below.

## **II. UPDATED NIST INTEROPERABILITY STANDARDS**

As noted above, in the June 2012 Order, the Commission directed ComEd to report on any updates to any applicable NIST standards and explain how it is addressing any such updates. The applicable NIST standards noted within the Revised AMI Plan are regularly reviewed by the Information Technology (“IT”) team at ComEd for completeness and accuracy. Each standard is studied to identify any updates or changes, and to determine whether it has been superseded by newer or more appropriate standards.

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<sup>44</sup> June 2012 Order at 25.

<sup>45</sup> 2013 AIPR Order at 10 and 15.

<sup>46</sup> Order of January 28, 2014 in Docket No. 13-0495 at 95.

NISTIR 7628 Guidelines for Smart Grid Cybersecurity include:

- Finalized combined cyber-physical attacks descriptions, which now includes physical impacts resulting from cyber-based attacks
- Supplementary cybersecurity testing and certification approaches and guidelines
- Best practices for 3rd parties to manage smart grid data and privacy concerns
- Cybersecurity issues associated with communications between electric plug-in vehicles and the smart grid
- New security awareness and training guides and templates (for both external consumers and internal personnel)
- Emerging privacy risks regarding the advent of new technologies and activities that could leverage the smart grid

Updates within NIST 7761 Priority Action Plan 2: Guidelines for Assessing Wireless Standards for Smart Grid Applications include:

- Extended approach and framework for modeling and evaluating wireless technologies
- Additional toolsets and templates for modeling and evaluating wireless technologies
- Sensitivity analysis and impacts for input parameters
- Further guidance, information, and considerations pertaining to wireless standards and implementing associated technologies for smart grid network designers/planners

The IT team reviewed these revisions accordingly and determined that the Revised AMI Plan remains aligned with the applicable NIST requirements detailed within the updated standards. This includes NIST recommendations related to customer data and privacy. Furthermore, the IT team continues to assess and evaluate any supplementary considerations that are mentioned by NIST for informational purposes.

Additionally, standard IT security management activities are completed by the IT team as a component of the required support of AMI systems. Security management activities are completed to align with ComEd policies and industry standards, and include activities such as deploying security system packages to allow for appropriate security and vulnerability monitoring, ensuring that deployed servers adhere to password and system control procedures, performing periodic server fixes and security updates, and performing vulnerability assessments as well as subsequent remediation steps to rectify any defects or findings.

### III. TIME OF USE RATE

#### A. Consideration of Utility TOU Rates

As reported in Appendix A to ComEd’s 2013 AIPR, which was investigated in ICC Docket No. 13-0285, ComEd met with the Smart Grid Advisory Council (“SGAC”) and other stakeholders at that time to discuss the development of time-of-use (“TOU”) rates within Illinois’ competitive market and reported the results of its meetings with stakeholders.<sup>47</sup> As a result of those meetings, ComEd concluded that a utility-offered TOU rate would be a potential disruption to the competitive market, and committed to continue to work with stakeholders to enable RES TOU offerings. The Commission agreed with ComEd’s conclusion and in its 2013 AIPR Order declined to require ComEd to offer a TOU rate.<sup>48</sup>

On February 13, 2015, the Citizens Utility Board (“CUB”) and Environmental Defense Fund (“EDF”) filed a Petition to Initiate a Proceeding to Investigate the Adoption of a Utility Time of Use Rate that was assigned ICC Docket No. 15-0100. Interveners included Elevate Energy, ComEd, the Illinois Power Agency, the Illinois Competitive Energy Association (“ICEA”), Ameren Illinois Company (“Ameren”), and the Retail Energy Supply Association (“RESA”). A Final Order was entered by the Commission on September 16, 2015, and concluded that the Petition was premature and would unnecessarily disrupt the process previously adopted by the Commission.<sup>49</sup> The Commission pointed to written guidance offered on March 14, 2012, in which the SGAC clearly recommended that stakeholders first work to enable RES TOU offerings, and to consider utility-offered TOU rates afterwards. That guidance stated:

Once the infrastructure and systems are in place to support TOU offerings by ARES, the initial question before the Illinois Commerce Commission (“ICC”) will be how to determine whether the offerings of Illinois’ alternative retail electric suppliers (“ARES”) include a sufficient set of TOU rate options to adequately serve the public interest.<sup>50</sup>

The 15-0100 Order further stated that the competitive RES market had not had an opportunity to develop and, thus, based on this SGAC Guidance, the Petition was premature. The Commission ultimately dismissed the matter, finding that to initiate an investigation at this stage in time, before the stakeholder process is complete, would be inappropriate.<sup>51</sup>

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<sup>47</sup> 2013 AIPR, App. A at 2-4.

<sup>48</sup> Docket No. 13-0285, final Order (June 26, 2013) at 15.

<sup>49</sup> Docket No. 15-0100, final Order (Sept. 16, 2015) (“15-0100 Order”).

<sup>50</sup> ICC Docket 15-0100, Petition, Attachment A (March 14, 2012 Guidance Regarding Implementation of Time of Use Rates, Smart Grid Advisory Council) at 5-6.

<sup>51</sup> 15-0100 Order at 9.

## **B. Facilitation of RES TOU Offerings**

### **1. Background**

In ICC Docket No. 12-0484, the Commission investigated ComEd's Petition to seek approval of tariffs implementing ComEd's Peak Time Savings ("PTS") program, pursuant to Section 16-108.6(g) of the PUA. In its Interim Order dated February 21, 2013, the Commission directed Staff to hold workshops with interested parties in order to address certain issues that arose during the investigation. Beginning in April 2013 and continuing on throughout 2014 and 2015, Staff hosted a series of "Enabling the Market" workshops that were attended by utilities, consumer groups, Retail Electric Suppliers ("RESs"), and other interested stakeholders. In addition to the items the Commission directed the parties to address, the workshops covered several AMI-related topics, including the release of customer-specific information by electric utilities and enabling RESs to offer TOU and other dynamic pricing products, which eventually led to the development of ComEd's Rider RMUD – Residential Meter Usage Data ("Rider RMUD"), which is discussed later in this section.

### **2. Release of Customer-Specific Information by Electric Utilities**

Several of the initial issues discussed at the Staff-led workshops revolved around the question of electric utilities releasing customer-specific information to third parties. While one of those issues, i.e., identifying customers participating in ComEd's PTS program, had been raised in Docket No. 12-0484, additional issues were identified in the workshop discussions that focused on how Sections 16-122 and 16-108.6 of the PUA impacted a utility's ability to release customer-specific information to third parties.

Recognizing that these issues would not be resolved in the workshops, the Commission's Office of Retail Market Development ("ORMD") issued a report dated August 30, 2013 (the "Staff Report") requesting that the Commission investigate certain issues: (1) the release of aggregated, anonymous customer usage information; (2) the release of information identifying PTS and net metering customers; and (3) RES access to its customers' interval usage data that is not used for the purposes of billing a customer. The Commission initiated an investigation in these matters on September 4, 2013 in Docket No. 13-0506 ("Data Privacy Docket").

On January 28, 2014, the Commission entered an Order ("Data Privacy Order") in the Data Privacy Docket. On February 18, 2014, CUB filed a Motion for Clarification. On February 28, 2014, ComEd timely filed an Application for Rehearing. On March 19, 2014, the Commission granted CUB's Motion for Clarification in part and issued an Amendatory Order reflecting the clarification. On March 19, 2014, the Commission also granted ComEd's Application for Rehearing in part on the sole issue of whether Sections 16-122 and 16-108.6 of the PUA allow a utility to release anonymous customer usage data to third parties that are not enumerated in Section 16-122 (such as researchers, energy efficiency program providers, and others that are not RESs or municipalities). The Commission entered an Order on Rehearing dated July 30, 2014 ("Data Privacy Order on Rehearing").

**a. Aggregated, Anonymous Data**

In the Data Privacy Order on Rehearing the Commission held that Section 16-122 and Section 16-108.6 of the PUA do not prohibit the release of anonymous customer usage information in accordance with the data protocol adopted in the Final Order which protects customer privacy and is in the public interest.<sup>52</sup>

The Commission further found that, pursuant to Section 16-122, no fee is specifically required for this data; however, there is nothing in Section 16-122 to prevent the utilities from charging a reasonable fee when providing this information. ComEd intends to include access to anonymous customer usage information as a tariffed service.

**b. Identification of PTS and Net Metering Customers**

From discussions during the workshops, there was an understanding that competitive suppliers have legitimate reasons to obtain certain information about individual customer accounts, and that freer access to various types of individual customer information could assist in realizing certain benefits available from the smart meter infrastructure. At the same time, ComEd and other parties expressed concerns related to customers' privacy interests – both in the obvious interest of adhering to state law and also because data privacy had been cited as a reason for customer refusals of smart meter deployment.

The Commission ruled that a customer's participation in PTS or net metering programs is billing data and that verifiable authorization from individual customers is required under the PUA before disclosure may occur. In the Data Privacy Order dated January 28, 2014, the Commission also found that the electric utilities should not be required to provide lists of customers that are PTS or net metering participants, as this would contravene Section 16-122. The Commission also determined that possession of an account number should be considered customer authorization to receive certain information about such customer's account, including whether the customer is a PTS or net metering customer, or a participant in any supply related or demand response program offered by the utility. Effective June 13, 2014, new indicators were added to the Summary Data request report and the Interval Usage Data request report available on the comed.com website as well as to the Municipal Aggregation Customer Report provided to communities implementing aggregation programs. The indicators were also added to the Customer Supply List available to RESs through the supplier portal. The indicators provide notification of customers currently receiving service under the following riders: Rider POGNM – Net Metering, Rider PTR - Peak Time Savings, and Rider A/C - A/C Cycling.

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<sup>52</sup> Data Privacy Order on Rehearing at 10-11.

**c. RES Access to Customer’s Interval Data Not Used for Billing Purposes**

The type of authorization required for RES access to non-billing interval data, as well as how RESs would verify to the electric utility that they obtained proper authorization, were discussed in the Enabling the Market workshops. These issues were or are being considered in two Commission proceedings, Docket Nos. 14-0701 and 15-0073. In Docket No. 14-0701, an investigation into the standard terms for customer authorization of access to interval usage data for non-billing purposes, the Commission approved standardized language that must be used to demonstrate RES authorization to access non-billing interval data. At Staff’s direction, as a result of workshop discussions throughout 2014, the warrant forms and processes were developed to allow RESs to certify to the utilities that they have obtained such authorization. ComEd filed Rate DART - Data Access and Retrieval Tenants (“Rate DART”) to provide the RESs access to up to twenty four consecutive months of AMI Historical Interval Usage not used for billing purposes for customers that they do not currently serve. The Illinois Commerce Commission approved the tariff on December 22, 2015 (Docket 15-0623). The warrant form is available to Retail Electric Suppliers for use of the data service and is available for their use in the Supplier Portal.

Docket No. 15-0073, an investigation into the customer authorization required for access to AMI interval data by third parties other than RESs, is currently pending in front of the Commission.

The Enabling the Market workshops also resulted in Supplier Portal enhancements which provide historical customer data for customers the RES serves. These enhancements included the ability for suppliers that register for Rider RMUD to obtain non-billing interval data for their customers daily instead of at the end of each billing period. Suppliers are now able to utilize a Supplier Portal to view this non-bill quality interval data on a daily basis (i.e. the day after) in addition to a one-time 24-month look back. The Portal retains a rolling 35 day historical interval usage for each customer on RMUD if the supplier would like to view the data. Since this data is not bill quality it may differ from the billing usage sent at the end of the monthly billing period via Electronic Data Interchange (EDI).

**3. RES TOU Offerings and Other Dynamic Pricing Products**

**a. Residential Meter Usage Data (“Rider RMUD”)**

As described in the 2015 AIPR, ComEd used the information and feedback from Enabling the Market workshop participants to design Rider RMUD – Residential Meter Usage Data (“Rider RMUD”). Beginning January 16, 2014, Rider RMUD authorized ComEd to provide granular residential meter usage data to authorized RESs taking service under Rate RESS – Retail Electric Supplier Service (“Rate RESS”) serving those residential customers that they provide not only electric power and energy supply services, but also TOU pricing and/or demand response products, all as described in the tariff. Rider RMUD was initially filed and approved as a pilot tariff. ComEd completed the upgrade of the new meter data management system (“MDMS”) in August of 2014, subsequently increased the number of customers RESs could receive such data to 100,000 from 15,000 through the end of 2015, and eliminated the customer cap as of January

1, 2016 – at which point Rider RMUD is offered generally rather than on its original pilot basis. As of the end of 2015, RESs were utilizing this service for 383 customers; well below any limitation ever required within the rider.

**b. Peak Time Savings**

Beginning in October 2014, and continuing through 2015, ComEd opened enrollment in the PTS program, which provided all customers with an AMI meter, regardless of supplier, the opportunity to begin receiving credits for energy curtailments during the summer months following enrollment.

**4. Additional commitments related to customized education related to TOU products:**

ComEd’s education and outreach efforts under the AMI Plan have included information on dynamic pricing products offered by ComEd and alternative suppliers and how customers can use them to achieve certain benefits. In addition to the customized education delivered to key customer segments describing ComEd offerings such as PTS, RRTP and web tools, the PlugInIllinois.com/smartmeter website continues to provide comprehensive details of RES offerings. As of February 2016, there were no TOU offerings presented on the PlugInIllinois site, however, ComEd is currently aware of four RESs offering TOU rates under the provision of Rider RMUD.

**IV. VULNERABLE CUSTOMERS**

As reported in previous AIPRs, stakeholders have agreed to define and identify vulnerable customers as customers belonging to the following customer groups:

1. Low income
2. Very young (from birth to age 5)
3. Older individuals (age 65 and older)
4. Those who have limited English proficiency or literacy
5. Individuals with a functional disability, such as impaired mobility
6. Persons who are socially isolated

ComEd makes best efforts to obtain information on vulnerable customers, but such information remains limited due to the unavailability of certain information – such as age and English fluency – that would enable identification of vulnerable customers based on the factors identified above. In addition, obtaining data on customers meeting any of the six criteria used to define vulnerable customers by zip code or census tract is not useful for purposes of the reporting requirements.

However, ComEd will continue to report on vulnerable customers using the limited information in its possession regarding low income customers (Group 1, above) and customers with qualifying life support equipment at the premises or having a certified medical condition in the

household (Group 5, above) and will supplement such reports if additional verifiable data becomes available from other entities, such as DCEO. In addition, ComEd will continue to administer assistance programs and will engage in education and outreach for low income customers. Low income customers are defined as those customers who participate in the Low Income Heating Assistance Program (“LIHEAP”), and the Residential Special Hardship Program. The previously utilized Percentage of Income Payment Plan (“PIPP”) program was suspended during 2015 due to the State of Illinois budget issues and ComEd did not run a CHA program in 2015.

In 2015 there were no further developments in acquiring data for Groups 2, 3, 4 or 6. As in 2015, in 2016 ComEd will continue to evaluate outreach to customers in need, where there is data to identify such customers, through alerts, enhanced messaging and payment arrangements.

## **V. DG MAPPING**

In the June 2012 Order, the Commission determined that concerns raised by CUB and the ELPC about perceived barriers to the installation of DG needed to be addressed in a separate rulemaking. The Commission, however, directed ComEd to work with interested parties to implement their “request for a map showing where distributed generation would be good or bad.”<sup>53</sup> Following meetings with interested parties, ComEd posted a map tool on its website and notified interested parties on August 15, 2013 of the posting.<sup>54</sup> ComEd last updated the map on September 23, 2015, and plans to update the map once per year. ComEd will continue to consider more frequent updates if there is a large increase in DG interconnection activities in the future. An update will also be necessary if and when there is a change to the rules that govern the review and approval of DG interconnection requests for DG facilities with a nameplate capacity of up to 10 MVA.<sup>55</sup>

## **VI. VOLTAGE OPTIMIZATION**

### **A. Background**

Voltage Optimization (“VO”) is a combination of Conservation Voltage Reduction (“CVR”) and Volt-VAR Optimization (“VVO”). These programs are intended to reduce end-use customer energy consumption and peak demand while also reducing utility distribution system energy losses. The ICC, in Docket No. 13-0495, stated that “A review of the record leads the Commission to believe that a VO feasibility study should be pursued and could in fact result in many direct and indirect benefits.” In accordance with ComEd’s 2014 AIPR, a Voltage Optimization Feasibility study was completed by Applied Energy Group (“AEG”) in December 2014. This Study was submitted as part of the 2015 AIPR filing.

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<sup>53</sup> June 2012 Order at 50.

<sup>54</sup> <https://www.comed.com/customer-service/rates-pricing/interconnection/Pages/distribution-under-10000kva.aspx>.

<sup>55</sup> 83 Ill. Admin. Code Part 466 – Electric Interconnection of Distributed Generation Facilities.

The study recommended a VO validation project to demonstrate the proposed VO implementation strategies, verify estimated VO factors, and develop simplified VO Measurement & Verification procedures on ComEd's distribution system. As indicated in the 2015 AIPR filing, ComEd has been planning to conduct a VO validation project on one of its Distribution Substations. Additional details regarding the planned VO validation project are provided below.

## **B. ComEd Validation Project Approach**

ComEd plans to implement a Validation Project for VO that should be fully functional by late 4<sup>th</sup> Quarter 2016 to validate the conclusions of the VO Feasibility Study conducted by AEG. This project will be conducted to measure and evaluate the extent of customer energy use reduction, the reduction in distribution system losses, operational challenges and other issues resulting from implementation of the VO Control application. The validation project will be implemented on a ComEd Substation that represents a complex transformer & bus configuration (Transformers with Load Tap Changers in a parallel configuration feeding a split ring type bus) regulating voltage on multiple feeder connections containing multiple customer types (Residential, Small Commercial & Industrial, and Large Commercial & Industrial).

A VO Control application is planned to monitor voltage at points between the substation and the last customer utilizing voltage readings from the substation bus, capacitor banks, and voltage regulators. VO Control is planned to also monitor feeder and substation transformer three phase average real and reactive powers. VO Control is planned to optimize both feeder capacitor and substation bus capacitor switching and minimize LTC operations. Substation Transformer LTC controls and switched feeder capacitors and feeder voltage regulators controls are planned to be operated by the VO control application to maintain customer voltage, as much as possible, within the lower half of the ANSI C84.1 Range A (service voltage) while maintaining a feeder power factor as close as possible to unity (100%). A Scheduling function is planned to be utilized for Measurements and Verification of the VO Control.

As part of the validation project, conditioning of the feeders is planned to be implemented to improve the voltage profile and minimize line losses. This could include the following:

- Balance loading on the feeder phases (phase balancing)
- Installation of mid-feeder voltage regulators with remote controls
- Installation of feeder capacitor banks with remote controls

The following are Goals & Objects for the VO Validation Project

- ✓ Analyze & Identify the technology requirements necessary to support VO system Implementation in managing the distribution voltage and devices from the substation to the customer service point.
- ✓ Evaluate the ability of a VO system to reduce customer energy use and reduce utility system losses
- ✓ Develop and Implement VO analysis training, operations, and maintenance materials
- ✓ Improve VAR management utilizing smaller capacitor banks under VO controls

- ✓ Monitor & Examine AMI voltage/loading data to understand operational impacts and determine any feeder conditioning requirements.
- ✓ Begin VO operations of the validation project in 2016. It is anticipated that data collected over a 12-month operating period will be sufficient to validate the assumptions and conclusions reached in the feasibility study. Additional data collection and evaluation for a period of up to 12 months may be necessary if unanticipated operational issues arise during the validation project.
- ✓ Assess and report learnings from the results of the validation project.

<b>VO Validation Project Milestones &amp; Timeline</b>	<b>End Date</b>
<b>VO Application</b>	
Issue RFP for Voltage Optimization Vendor Application	Q1/2016
Evaluate/Select/Award Voltage Optimization Vendor Application	Q2/2016
Application Development with VO Vendor	Q2/2016
Voltage Optimization System Integration & Commissioning	Q4/2016
<b>Substation/Feeder Design Phase</b>	
Select Substations & Feeders for VO Pilot/Validation Deployment	Q2/2016
Develop PDs for Validation Substation & Feeder Enhancements	Q2/2016
Develop Engineering Designs for Substation & Feeder Enhancements	Q2/2016
<b>Construction Phase</b>	
Procure Major Materials (Capacitors, Regulators, Relays, & Controllers)	Q3/2016
Construct Substation & Feeder Enhancements	Q4/2016

### C. Budget and Cost Recovery

A preliminary estimate of the cost of the validation project is \$4M, which, along with the costs of the feasibility study, ComEd intends to pay from general corporate funds and recover through the distribution formula rate. The recovery of the validation project costs will be addressed further in ComEd’s 2016 Formula Rate Update proceeding.