AMERICAN ELECTRIC POWER

Legal Department

June 1, 2016

Asim Z. Haque
Chairman, Public Utilities Commission of Ohio
Public Utilities Commission of Ohio
180 East Broad Street
Columbus Ohio 43215-3793

Re: *In the Matter of the Application Seeking Approval of Ohio Power Company's Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Agreement Rider*, Case No. 14-1693-EL-RDR; *In the Matter of the Application of Ohio Power Company for Approval of Certain Accounting Authority*, Case No. 14-1694-EL-AAM

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Dear Chairman Haque:

In accordance with Section III.G of the December 14, 2015 Joint Stipulation and Recommendation, I am submitting AEP Ohio's Grid Modernization Report for the Commission's consideration.

Thank you for your attention to this matter.

Respectfully Submitted,

//s/ Steven T. Nourse

cc: Parties of Record

AEP OHIO
Grid Modernization Report

JUNE 1, 2016

gridSMART® From AEP OHIO®

Executive Summary

American Electric Power (AEP) Ohio sees great value associated with modernizing the distribution grid. Developing grid modernization opportunities that deliver benefits that exceed associated costs is the purpose of AEP Ohio's gridSMART® initiative, which comprises the majority of the Company's grid modernization activities along with asset renewal efforts associated with the Distribution Investment Rider. The gridSMART® initiative integrates a suite of advanced grid technologies into the existing electric network to improve service quality and reliability, lower energy consumption, increase customer control in energy consumption, and save money.

AEP Ohio recently concluded Phase 1 of this gridSMART® initiative, which evaluated a broad scope of potential smart grid technologies on a smaller scale in order to guide subsequent deployment plans. From this effort, AEP Ohio received customer feedback along with data that point to significant customer and utility benefits. Based on analysis of information gathered in Phase 1, AEP Ohio developed a proposed gridSMART® Phase 2 project plan. On September 13, 2013; AEP Ohio filed its Phase 2 application to further roll-out these gridSMART® technologies. On April 7, 2016, the Company and Staff reached a settlement with a majority of the Interveners on this gridSMART® Phase 2 case and filed a Joint Stipulation and Recommendation (Stipulation). Accordingly, all of the references to Phase 2 activities and plans discussed in this report are premised upon the Commission's acceptance of the gridSMART® Phase 2 Stipulation.

The Company's current Phase 2 initiative builds on experience gained in the performance and communication interfaces of these technologies and prepares AEP Ohio for a more efficient and effective implementation as it deploys select technologies and process improvements on a broader scale and to a more diverse customer base.

Phase 2 technologies will comprise advanced metering infrastructure (AMI), distribution automation circuit reconfiguration (DACR) and volt/VAR optimization (VVO) technologies. AEP Ohio is targeting a deployment timeline of approximately four years for AMI and six years for DACR and VVO.

AMI deployment targets approximately 894,000 customers across urban and suburban areas. AMI meters provide AEP Ohio with the ability to remotely gather meter data at pre-defined time intervals enabling detailed visibility into electric usage and power delivery at the customer premises. AEP Ohio can then use this meter data to provide information about electricity usage to customers and authorized third-party service providers, which increases customer flexibility and control in their energy consumption, and can drive cost savings.

DACR deployment is targeted for approximately 250 priority circuits. DACR principally involves the installation of "smart" reclosers on the distribution grid. This technology provides critical information to the control center regarding faults on AEP Ohio's distribution grid as well as enabling the control center to operate the reclosers remotely. DACR significantly reduces both the extent of outages (i.e., the number of customers affected) and the duration of outages (i.e., how long customers are without power). In addition, DACR provides significant maintenance and safety benefits.

VVO deployment is targeted for approximately 160 circuits. Currently, in areas where VVO has not been installed, AEP Ohio regulates voltage through ordinary voltage regulators and capacitors that provide no remote visibility into actual voltage levels on the grid. Because of this, voltage levels at the substation must be set higher than might otherwise be required in order to ensure that voltage does not drop below the acceptable range for all circumstances throughout the year. VVO allows for lower voltages, and thus less energy usage, to be maintained to provide the same level of circuit service reliability.

Deployment of gridSMART® technologies helps improve the safety of AEP Ohio's employees while also improving reliability, with customers experiencing fewer outage events and faster restoration time when outages do occur. gridSMART® technologies also benefit customers through improved energy efficiency and demand reduction. As the company expands deployment into Phase 2, these technologies will support a more robust market for customer choice by enabling customer access to information, improved data for market settlement, and potential for time-differentiated rate design offerings from third-party service providers. Such improved access to customer energy usage information enables customers to better control their energy usage, conserve energy, save money, and help protect the environment.

Introduction

American Electric Power (AEP), through its gridSMART® initiative, has been actively engaged in planning, deploying, and evaluating smart grid technologies and programs across the 11-state AEP system since 2007. This initiative integrates a suite of advanced grid technologies into the existing electrical network to improve service quality and reliability, lower energy consumption, and save customers money. These new technologies can help AEP improve efficiencies, identify and respond to outages more quickly, and better monitor and control the operation of the distribution grid.

gridSMART® Phase 2 will extend the technology benefits realized in Phase 1 to a larger base of customers as well as:

- Support a more robust customer choice market by enabling access to data, leading to improved products and services for customers
- Enhance customer service and satisfaction
- Provide customers with information to help them conserve energy, save money, and protect the environment

Through cooperation with the Public Utilities Commission of Ohio (PUCO), AEP Ohio is leading this effort in Ohio. The recently completed gridSMART® Phase 1 project—which deployed a comprehensive suite of innovative smart grid technologies on 80 distribution circuits with 132,000 customers in Northeast Central Ohio—was designed to evaluate a broad scope of potential smart grid technologies on a smaller scale in order to guide subsequent deployment plans in Phase 2.

In Phase 1, AEP Ohio gained valuable experience in the performance of these technologies, as well as in the operation of communication interfaces and how to optimize the processes to deliver on the benefits envisioned. In many respects, the lessons learned from the Phase 1 project guided the choice of which technologies to deploy in Phase 2.

The following benefits have been achieved as a result of AEP Ohio's Phase 1 in the deployment area:

- Improved safety for AEP Ohio employees
- Operational efficiencies through real-time information and remote operations
- Fewer number of customer outage events
- Reduced number of customers experiencing sustained (>5 minutes) outages
- Faster restoration times for sustained outages (>5 minutes)
- Demand reduction through new tariff offerings and the education of customers regarding energy costs and use of technology
- Improved energy efficiency and demand reduction with volt/VAR optimization (VVO)
- Improved customer satisfaction
- Lower emissions

AEP Ohio believes that an expansion of the gridSMART® project into a Phase 2 will help enable a fundamental change in the way the Company operates, serving as the necessary foundation upon which more reliable service and additional opportunities for efficiency are provided to customers, both now and in the future. The company is developing select technologies to enable its customers to make choices that improve their service, reduce cost, and deepen their relationship with AEP Ohio—beyond the basics of monthly billing and outage restoration.

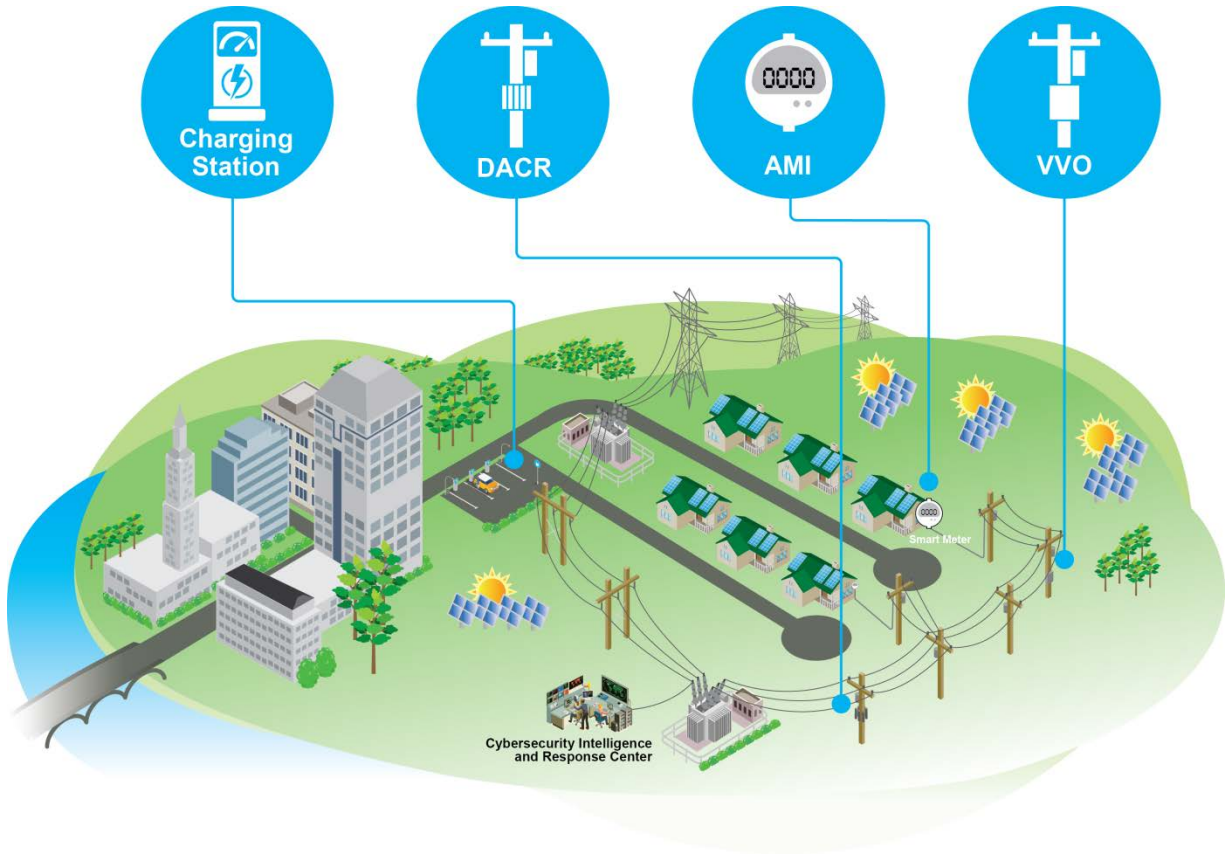

Figure 1: AEP Ohio's gridSMART® Phase 2 Vision

Figure 1 illustrates AEP Ohio's vision for its Phase 2 gridSMART® initiative. This vision builds on the success achieved in Phase 1 deployment of a host of smart grid technologies. While the primary focus of gridSMART® Phase 2 is the deployment of advanced metering infrastructure (AMI), distribution automation circuit reconfiguration (DACR), and volt /VAR optimization (VVO) technologies, AEP Ohio also envisions efforts related to plug-in electric vehicles (PEV), cybersecurity, and enhancement of the competitive market in Ohio.

This document describes the technologies to be deployed as well as the benefits, costs, and rate impacts for gridSMART® Phase 2. The document also addresses AEP Ohio's strategy for customer communications and outreach for Phase 2, which will largely mirror the successful strategy utilized in Phase 1, albeit on a larger scale. Lastly, this document discusses how these technologies enable distributed energy resources and the competitive market in Ohio.

Phase 2 gridSMART® Technologies

The following provides a description of the technologies intended for deployment in Phase 2 of AEP Ohio's gridSMART® program.

Advanced Metering Infrastructure (AMI)

AMI consists of digital customer electric meters and a two-way wireless communication system that provides a facility for meter communication and transporting meter data. AMI also includes a series of back-office systems that securely oversee the meters and associated network, collect meter data, and then process and store meter data for use by the utility in a variety of business functions.

AMI meters provides AEP Ohio with the ability to remotely gather electric meter data at pre-defined time intervals, enabling detailed visibility into electric usage and power delivery at the customer premises. AEP Ohio can then use this meter data to provide information about electricity usage to customers and stakeholders as well as to provide time-differentiated rates. This data can also be used to develop a number of customer-focused analytics that enable improved outage identification and restoration times, more meaningful customer-specific program offerings, and more timely identification of meter issues that ultimately reduce customer bills, such as theft.

AMI Technology

Meters will also be available with home area network (HAN) interface modules providing a gateway within the premises for customer access to meter data and functions. The HAN is implemented using a wireless technology such as Zigbee to enable the connection of devices to the meter within the premises, for example smart thermostats, in-home displays and mobile apps. Such connection to devices within the home can enable current or future demand-side technologies that allow customers greater flexibility to use energy more efficiently and/or respond to time-of-use rates that may contribute to a generally more efficient power system. AEP Ohio is implementing HAN interface capability for residential customers although the Company has elected to install meters with the HAN interface turned off by default, until such time as specifically related customer programs are implemented and the HAN interface is required. Lastly, most residential AMI meters will be configured to include service switches to allow AEP Ohio to disconnect and reconnect electric service without utility personnel having to visit the premises.

Distribution Automation Circuit Reconfiguration (DACR)

The DACR proposed in AEP Ohio's gridSMART® program principally involves the installation of "smart" reclosers on the distribution grid. A recloser is a piece of distribution infrastructure that is capable of sensing faults on a distribution circuit and automatically cutting off electricity flows by isolating the faulted

section of line. The smart reclosers installed through the gridSMART® program have the capability of two-way communication with a centralized control system.

DACR Technology

The smart reclosers provide critical information to the distribution control center regarding faults on AEP Ohio's distribution grid and enable the distribution control center to operate the reclosers remotely. DACR significantly reduces both the extent of outages (i.e., the number of customers affected) and the duration of outages (i.e., how long customers are without power). In addition, DACR provides significant maintenance and safety benefits.

AEP Ohio has already installed manual reclosers on many parts of its distribution grid; however, the existing reclosers have limited functionality. When smart reclosers are installed at key points in the distribution grid, these reclosers, in conjunction with a centralized controller, can automatically identify and react to outages. Without any required input from human operators, this DACR technology can reconfigure circuits so that power flows are restored or outages are isolated and limited to the smallest possible area. In most cases, this reconfiguration process takes less than two minutes.

DACR provides detailed information about outages to dispatchers in AEP Ohio's Distribution Dispatch Center, as well as to lineman working in the field. With DACR, dispatchers and linemen receive continuous information from smart reclosers regarding the existence and location of faults. This significantly improves the ability of dispatchers and linemen to diagnose, prioritize, and resolve outages.

When circuits require switching for maintenance, construction, or returning to normal configuration following an outage event, DACR and smart reclosers enable this switching to be accomplished remotely by a distribution dispatcher. This allows line personnel to focus on other priority work and also reduces truck rolls and improves safety.

Volt/Var Optimization (VVO)

VVO provides energy efficiency improvements related to optimizing voltage levels on the distribution grid. AEP Ohio is required to deliver electric service to customers within specific voltage ranges. For example, for customers receiving secondary voltage service (including most residential and small commercial customers), AEP Ohio is required to provide electric service between 114 and 126 volts at the meter. Due to various factors, utilities experience voltage drops as electrical energy travels through the distribution system. As such, AEP Ohio often sets transformers at substations to provide electric energy at higher voltages. By the time the electric energy reaches meters down the circuit, voltage may have dropped to lower levels. The factors that cause these voltage drops can fluctuate over time. Currently, in areas where VVO has not been installed, AEP Ohio regulates voltage through ordinary voltage regulators and capacitors. These devices provide no remote visibility into actual voltage levels on the grid. Because

VVO Technology

of this, voltage levels at the substation must be set higher than might otherwise be required in order to ensure that voltage does not drop below the acceptable range for all circumstances throughout the year.

The gridSMART® VVO program involves the installation of voltage sensors at key parts of the grid that are capable of transmitting real-time voltage information to a centralized control. In addition, “smart” controls are installed on capacitors and regulators that allow the VVO control to automatically increase and decrease voltage levels remotely. Through VVO, AEP Ohio can increase voltage when necessary to compensate for voltage drops and reduce voltage when levels are elevated. Over time, this enables AEP Ohio to achieve an overall reduction in grid voltage levels while ensuring that voltage at the meter never drops below the permissible range. Generally, lower voltage levels equate to lower energy usage.

Phase 2 gridSMART® Technology Benefits

Each of the technologies planned for deployment in Phase 2 of the gridSMART® program has been evaluated in Phase 1 and has been shown to deliver positive benefits to AEP Ohio and its customers. These benefits are consistent with those experienced by other utilities employing these technologies. Benefits for each technology in Phase 2 of gridSMART® are described below and illustrated in Figure 2.

Advanced Metering Infrastructure

For AEP Ohio, AMI deployment has delivered benefits in multiple categories. For the utility, the main benefit has been financial in terms of lower labor costs and other efficiencies. Other benefits that impact AEP Ohio employees and customers which are not easily quantified are also identified below.

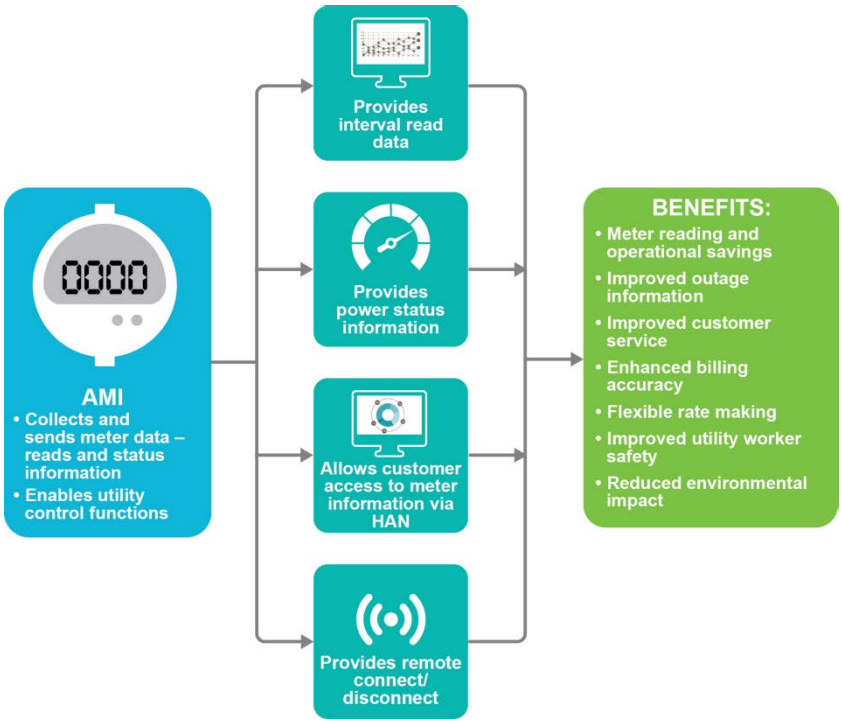

Figure 2: AMI Technology Benefits

Quantified Benefits

Meter Reading and Operations

As a result of installing AMI meters in Phase 1 of the gridSMART® program, AEP Ohio was able to eliminate 187 meter reading routes. This has resulted in a reduction in labor costs and other expenses previously associated with the monthly collection of meter reads. AEP Ohio expects to eliminate further meter reading routes, thereby achieving cost reductions. AMI also enables AEP Ohio to reduce costs associated with meter operations activities through the use of remote service switch capabilities that enable secure connection and disconnection of electric service to customer premises from the utility back office. As a result of this new capability, AEP Ohio was able to reduce field visits associated with standard move in/move out orders.

The combined meter reading and meter operations savings for Phase 1 of gridSMART® totaled approximately $860,000 (this equates to $6.50 per meter per year). For Phase 2 of the gridSMART® program, the per-meter savings are projected to be higher ($6.71-$7.83 per meter per year) because meters are less geographically concentrated in Phase 2 than in Phase 1. This naturally drives higher meter reading costs which will now be avoided. Phase 2 projections also include labor inflation. As a

result of these factors, the increased meter deployments planned for Phase 2 are projected to yield approximately $6-$7 million in annual financial benefits, as shown in Table 1.

Category	Phase 1 Result	Phase 2 Projection
AMI Meters	132,000	894,000
Meter Reading and Meter Operations Savings (Annual)	$860,000 ($6.50/meter)	$6,000,000- $7,000,000 ($6.71-7.83/meter)

Table 1: Financial Benefits from Meter Reading and Operations Improvements

Credit and Collections

Revenue enhancements through earlier theft detection, lower consumption on inactive meters, and greater billing accuracy are projected to lead to an additional $8-$10 million in annual utility benefits. Of that benefit, $1.5-$2.0 million annually is operational savings, including staff labor, from the use of the remote service switch specifically for credit disconnects as a result of Phase 2 gridSMART® meter deployments. It is important to note that the benefits associated with automated credit disconnects require a PUCO waiver for the current process that requires on-site customer interaction by AEP Ohio staff at the time of disconnection. The PUCO would need to consider whether and how the rules should be adjusted to allow for credit disconnects, considering all stakeholder options.

Unquantified Benefits

Improved Billing Data

With automated meter reads, AMI nearly eliminates estimated bills, leading to greater billing accuracy. AMI has been proven to yield a typical monthly read rate of 99.9 percent as compared to AEP Ohio's current average of 92.2 percent. With automated meter reads and a higher read rate, AMI leads to greater billing accuracy and improved customer satisfaction.

Customer Service

AMI leads to better service and customer satisfaction. For instance, when a customer wishes to terminate service, the AMI meter can be read remotely and a final bill sent without delays caused by manual reads. Similarly, AMI meters equipped with a remote service switch enable power to be turned on or off remotely. As a result, a customer moving in can have service turned on within minutes rather than waiting days. While customer service and satisfaction does not lend itself to financial quantification, it is expected that greater customer satisfaction may contribute to fewer calls into call centers from customers, fewer billing disputes, and possibly lower rates of billing delinquency.

Third-Party or Communications-Enabled Customer Meter Data Access

By providing meter read information via a third-party portal, accessed via computer or even smartphones, AMI also provides customers with the data that enables them to view their energy consumption on a more detailed level and to better understand timely actions they may take to manage their consumption. The

availability of this data can also enable customers to participate in programs such as enhanced demand response (DR) or time-differentiated pricing tariffs that might be offered by DR or Competitive Retail Electric Service (CRES) providers. Such programs are designed to reduce peak demand, thereby allowing customers to benefit through savings. Additionally, HAN devices can be used by the customer to better utilize the data and pricing signals to control their consumption activity. AEP Ohio views its role as a provider of the metering infrastructure that enables the offering of these programs by market participants.

Rate Making Enablement

Customer programs similar to the gridSMART® Phase 1 SMART Shift and two-tier time-of-day tariff can provide significant net benefit to customers. AEP Ohio's program enables DR or CRES providers the ability to offer similar programs to Phase 2 AMI customers, with estimated net customer benefits, assuming 5 percent penetration and 10 percent peak load reduction across all AEP Ohio customers, of potentially $4 to $6 million in annual customer savings.

Remote Customer Service

AMI provides billing and call center efficiencies that will enable staff to address more inquiries and to do so faster. Customers should experience fewer billing issues from continual meter reads and the elimination of estimated meter reads through AMI, and call center representatives will have real-time access to meter data which will help them discuss actual usage information with customers. When a customer calls about power loss, the real-time access also will enable call center representatives to determine whether the power loss is due to an outage or to an issue on the customer side of the meter, such as a blown house breaker fuse.

Reliability

When an AMI meter detects a loss of voltage, a message is sent indicating the customer has lost power. Messages that successfully reach AEP Ohio's internal systems can be used in conjunction with customer telephone calls to predict the extent of the outage. Also, meters can be interrogated remotely to obtain an indication of whether a customer has power or not. This indication can be useful to troubleshoot customer issues and to verify power restoration following an outage.

Safety

Because crews can remotely determine whether a meter has power, crew exposure and safety is improved. Also, AMI requires fewer meter readers in the field, which will reduce physical meter reading efforts and consequently reduce safety issues. AEP Ohio estimates that incidents and severity days associated with meter reading will be reduced by 72 percent relative to the past two years' performance. AEP Ohio has also pioneered the use of internal meter temperature data retrieved from AMI metering to monitor and proactively address potential problems arising from meter socket failures leading to possible internal component overheating and possible service interruption.

Environment

With remote capabilities, the number of miles driven by metering and service personnel will be reduced by an estimated 440,380 miles annually following meter deployments in Phase 2 of the gridSMART® program. Fewer vehicle miles traveled are estimated to result in 186,556 metric tons of CO_2 avoided annually.

Distribution Automation Circuit Reconfiguration

DACR is designed to improve outage identification and restoration times, and to improve storm hardening with enhanced visibility in the areas where the systems are deployed. DACR reliability improvements and benefits are shown Figures 3 and 4, respectively.

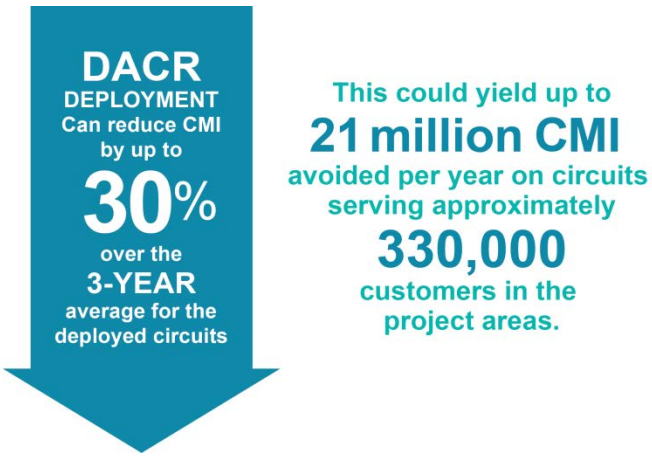

Figure 3: DACR Reliability Improvements

Outage Metrics

During Phase 1, AEP Ohio was able to reduce Customer Minutes of Interruption (CMI) by 1,861,441 minutes, improving reliability for 22,427 customers in 2012. In 2012, all customers on the 70 DACR circuits experienced a System Average Interruption Frequency Index (SAIFI) of 1.228 as compared to 1.429 without DACR deployed on the same 70 circuits—an improvement of 14.1 percent. All customers on the 70 DACR circuits experienced a System Average Interruption Duration Index (SAIDI) of 161.5 as compared to 178.3 without DACR deployed on the same 70 circuits—an improvement of 9.4 percent.

Phase 2 will deploy DACR technology on approximately 250 circuits that have the characteristics of being best positioned to yield reliability improvements. This deployment is targeted to reduce CMI by up to 30 percent over the three-year average for the deployed circuits, which is approximately the midpoint of the achieved CMI reductions reported by the U.S. Department of Energy (DOE) in December 2012 for utilities that had prior experience with automated feeder switching. This could yield more than 21 million CMI per year on circuits serving more than 330,000 customers in the affected areas.

Labor Efficiency

DACR is also expected to provide for crew labor savings, up to 2 hours per event, and in some instances avoid service calls entirely. These benefits are expected to provide opportunities for AEP Ohio to perform additional proactive work on circuits in need of service, further enhancing reliability.

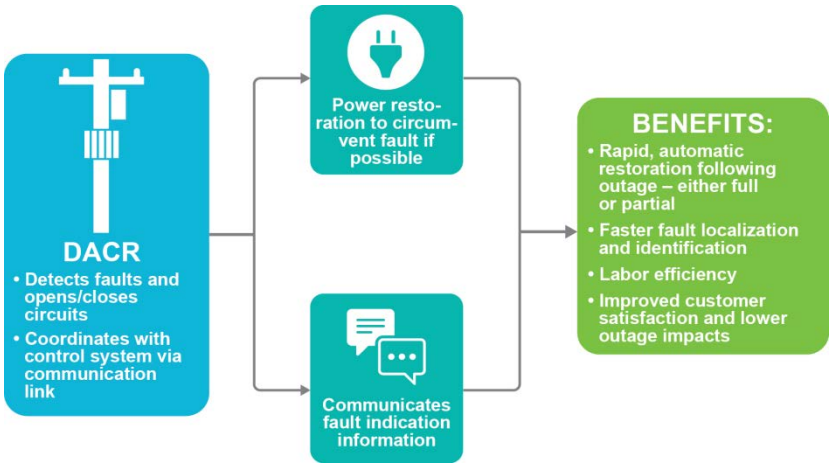

Figure 4: DACR Technology Benefits

Economic Output

Based on a study by the Ernest Orlando Lawrence Berkeley National Laboratory[1] (LBNL), AEP Ohio estimates that DACR could reduce societal costs by approximately $71 million per year through the reduction of outages experienced by customers.

Outages pose significant hardships on all customer classes. Impacts to vital premises functions such as heating, cooling, and medical life support operation can impact residential customers. Additionally, residential customers are susceptible to significant satisfaction impacts due to outage concerns. For commercial and industrial customers, outages can be costly and can result in direct economic impacts. Based on a study commissioned by the DOE estimating CMI costs,[2] and as described in the updated gridSMART® Business Case, multiplying these costs by the number of expected CMI saved through gridSMART® Phase 2 DACR deployment results in an estimated customer reliability benefit of $1.016 billion over fifteen years ($519 million in net present value)[3].

Volt/VAR Optimization

VVO enables optimized operation and efficiency via intelligent control and the application of communications technology. The following benefits, which are illustrated in Figure 5, are anticipated through extended VVO deployment in Phase 2 of the gridSMART® program.

Efficiency

By enabling AEP Ohio to deliver energy at lower acceptable voltage levels, VVO provides an overall reduction in energy consumption on circuits where the technology is installed. Based on experience with VVO deployment on 17 circuits in gridSMART® Phase 1, AEP Ohio expects to achieve an overall average VVO energy efficiency gain of 3 percent. This figure is based on both pre-deployment modeling of Phase 1 as well as measurement of actual data post Phase 1 deployment. Relative to other technologies, a 3 percent

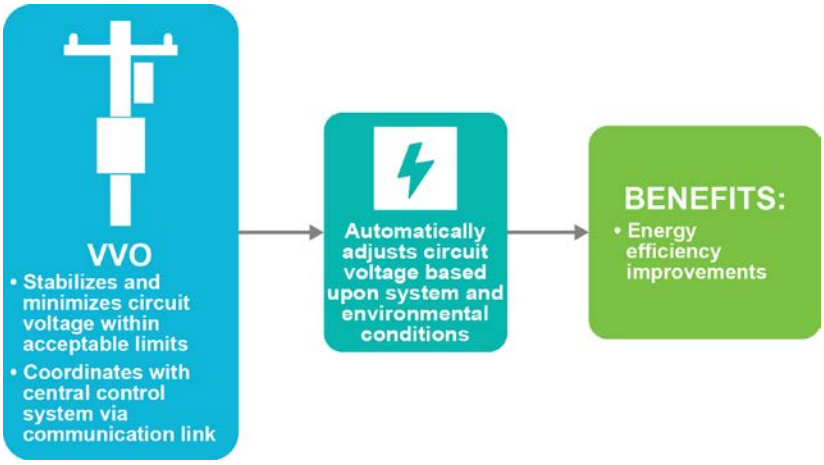

Figure 5: VVO Technology Benefits

[1] Kristina Hamachi LaCommare & Joseph H. Eto, *Cost of Power Interruptions to Electricity Consumers in the United States* (Ernest Orlando Lawrence Berkeley National Laboratory, February 2006). Available at https://emp.lbl.gov/sites/all/files/report-lbnl-58164.pdf
[2] Ibid.
[3] Results from the LBNL study were updated to reflect expected Phase 2 impacts as of 2012-2013.

energy reduction is significant. AEP Ohio estimates that VVO will enable energy efficiency savings of $210 million in overall bill savings related to the VVO deployment for the 15-year business case period.

Environment

VVO technology will lead directly to lower energy consumption and, therefore, lower output from power plants. AEP Ohio has also committed to using best efforts to seek appropriate compliance credit under the Clean Power Plan for emissions reductions attributable to gridSMART®.

AEP Ohio gridSMART® Deployment Roadmap

AEP Ohio has defined specific deployment plans for the technologies to be implemented in Phase 2 of the gridSMART® program according to the following general schedule highlighted in Figure 6. The deployment benefits of Phase 2 technologies are illustrated in Figure 7 on the following page.

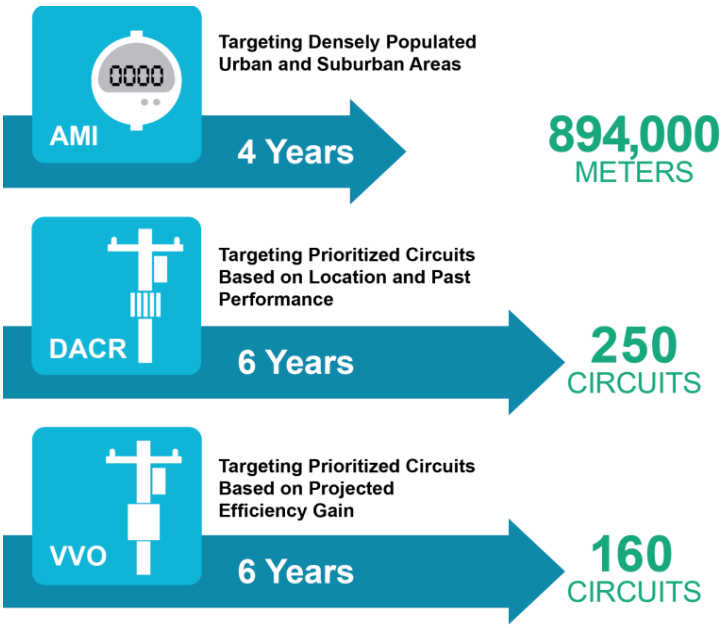

Figure 6: gridSMART® Phase 2 Deployment Roadmap

Advanced Metering Infrastructure

AEP Ohio currently has approximately 1.5 million meters installed throughout its service territory. Of this total, AEP Ohio converted approximately 132,000 meters to AMI in the Phase 1 project. The current AMI technology is proven for urban and suburban deployment areas, typically with meters in relatively close proximity to one another. In Phase 2, AEP Ohio expects to convert an additional 894,000 meters to AMI bringing the total to just over one million AMI meters across its service territory.

The deployment for Phase 2 will be focused primarily on more densely populated areas having 2,000 meters or more in reasonably close proximity. This strategy will reduce deployment costs based upon labor efficiencies, and will ensure a properly functioning meter network and connectivity. AEP Ohio has an additional 500,000 customers who have automated meter reading or will be equipped with automated meter reading by the end of the Phase 2 AMI deployment. AEP Ohio will continue to carefully evaluate meter and networking technologies to determine how best to serve these customers in the most cost-effective manner possible while delivering maximum benefits. If the AMI technology continues to advance and a rural AMI solution becomes more cost effective, AEP Ohio may re-evaluate the plan regarding rural meter technology.

Phase 2 meter deployments are expected to occur over a 48-month timeline once approval is received. AEP Ohio envisions all meters to be replaced with an advanced meter technology, such as automated meter reading (AMR) or AMI, over the next four years.

Distribution Automation Circuit Reconfiguration

Of the approximate 1,600 total distribution circuits within AEP Ohio, the Company deployed DACR on 70 circuits in Phase 1. DACR deployment for Phase 2 will involve a total of 250 circuits. AEP Ohio will prioritize circuit selection for DACR based upon those that have adequate circuit ties or are adjacent to other circuits, and that also have a history of appearing on the AEP Ohio Rule 11 Report (worst-performing circuit list) in recent years. Analysis will be undertaken to determine which circuits will yield maximum customer reliability benefits for the 250 circuits and will take into account Rule 11 circuits.

The DACR deployment is expected to require approximately 72 months after approval. Under a gridSMART® Phase 3, cost-efficient deployments for the remaining circuits will be evaluated.

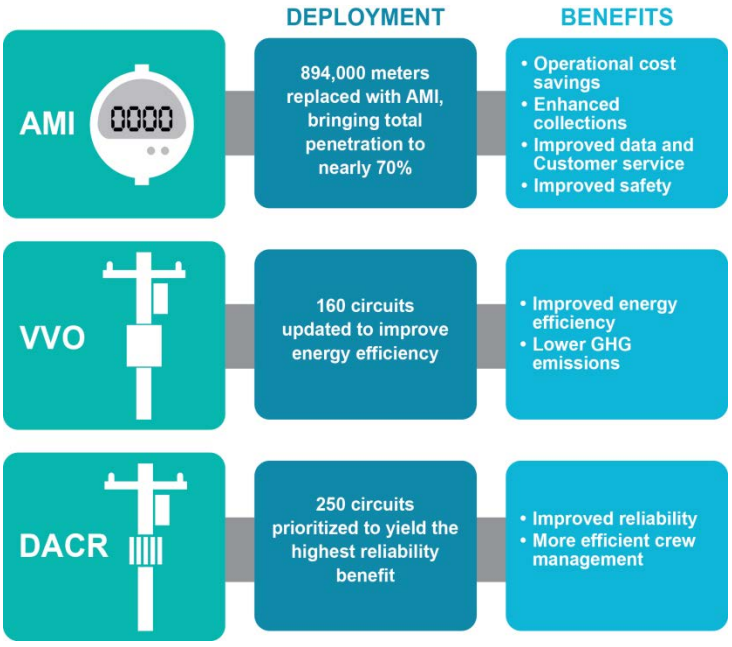

Figure 7: Deployment Benefits of Phase 2 Technologies

Volt/VAR Optimization

The Company has also deployed VVO on 17 distribution feeders at five substations as part of Phase 1. Currently, the Company has targeted approximately 160 circuits for VVO deployment as part of Phase 2. The VVO deployment is expected to take approximately 72 months after approval.

Additional circuits that are considered viable candidates for VVO could then be proposed for deployment under a Phase 3 plan at a later date or under the Distribution Investment Rider, if approved by the PUCO or under the Energy Efficiency (EE) program when needed to meet required objectives.

Engineering Feasibility and Selection Studies

AEP Ohio has committed to perform engineering feasibility and selection studies related to the gridSMART® Phase 2 deployment of AMI and DACR technologies. These studies will describe how the AMI and DACR deployment locations are selected in order to maximize benefits. This study will be completed and submitted to the PUCO no later than one year after approval. Moreover, AEP Ohio has committed to perform a full system feasibility study to plan for additional AMI, DACR, and VVO deployment beyond gridSMART® Phase 2.

Customer Costs and Benefits

AEP Ohio expects to incur costs associated with investing in and installing each technology, although these costs are expected to yield significant benefits. To properly quantify the benefits from the implementation of Phase 2 technologies, AEP submitted to the PUCO a comprehensive gridSMART® Phase 2 Business Case. This Business Case provided an account of AEP Ohio's successful gridSMART® Phase 1 deployment and catalogued the many benefits already being realized from that initial rollout. It then provided specific plans for gridSMART® Phase 2, a comprehensive effort to bring the successful gridSMART® program to a large portion of AEP Ohio's customers.

Phase 2 involves a variety of benefits and costs which have been evaluated over a 15-year period. Table 2 shows the quantified difference between benefits and costs and reflects the customer impact. Each metric is shown below with two different views: the Cash View (or nominal view) and the Net Present Value (NPV) View.

For the comprehensive benefits and costs for the three technologies, the Cash View shows a net of $910 million benefit and benefit-cost ratio of 2.8. The NPV shows a net of $360 million benefit and a benefit-cost ratio of 2.0. Figures 8 and 9 below provide a summary of the costs and benefits estimated to be derived from the implementation of gridSMART® Phase 2.

		Dollar Values in $Millions	
		Cash View	Net Present Value View
15-year Benefits	O&M	$199	$103
	Capital	$1	$1
	Energy / Capacity	$210	$102
	Reliability	$1,016	$519
	Total	$1,426	$725
15-Year Costs	O&M	$148	$83
	Capital	$368	$282
	Total	$516	$365
Net Benefit / (Cost) Impacts	Net Benefit/(Cost) Impact	$910	$360
	Benefit/(Cost) Ratio	2.8	2.0

Table 2: Estimated Costs and Benefits of Phase 2 gridSMART® Deployment[4,5]

[4] Based on the "Cost of Power Interruptions to Electricity Consumers in the United States, Ernest Orlando Lawrence Berkeley National Laboratory" (2006).

[5] The Cash View reflects the nominal estimated expenditures and benefits related to the Phase 2 implementation. The NPV is calculated using an After Tax Weighted Average Cost of Capital (WACC) of 7.69 percent.

As indicated in Table 2, the reliability benefits of deploying Phase 2 of gridSMART® were based on a 2006 study conducted by Ernest Orlando Lawrence Berkeley National Laboratory. AEP Ohio is aware that subsequent studies have been published since 2006 to update the results of this study. When evaluating the effects of subsequent studies on the results estimated for Phase 2 herein, reliability benefits would increase. In an effort to remain conservative in providing a cost/benefit analysis of deploying Phase 2 of gridSMART®, AEP Ohio has opted to continue to rely on the results of the 2006 study rather than update estimates in accordance with more recent studies of the value of grid reliability.

In Figure 8 below, one can see the degree to which benefits outweigh the costs of Phase 2 of gridSMART®. Even when controlling for the time value of money, which quantifies the lag in benefits accruing to the AEP Ohio system after the initial capital investment required for each technology, the benefits of the Phase 2 deployment outweigh the costs.

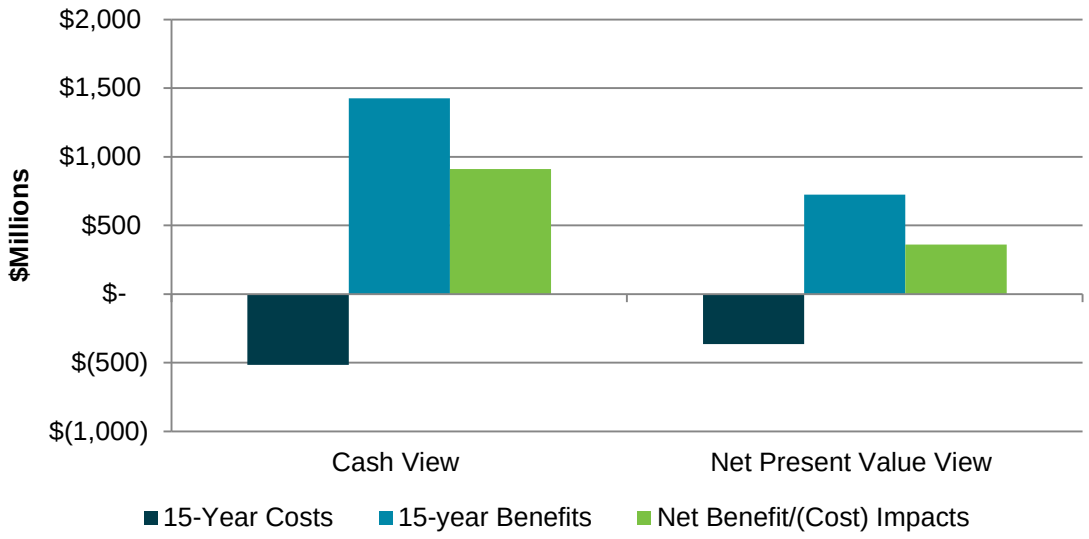

Figure 8: Estimated Costs and Benefits of Phase 2 gridSMART® Deployment

Figure 9 below portrays the ratio of benefits to costs for the Phase 2 deployment. In the Cash View, the ratio of benefits to costs exceeds 2.5, and in the Net Present Value View, the ratio equals roughly $2 in benefit for every $1 in cost.

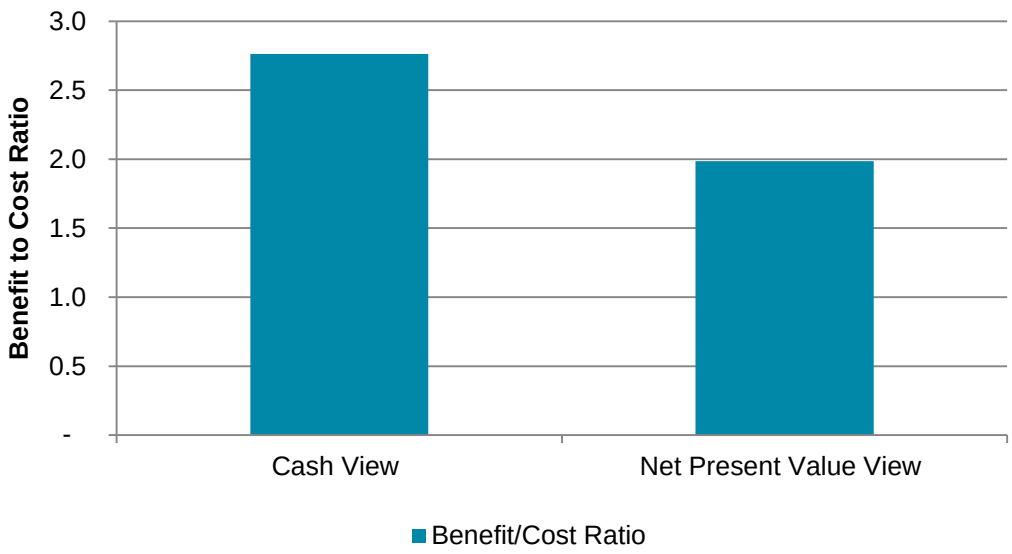

Figure 9: Ratio of Estimated Benefits to Costs for Phase 2 gridSMART® Deployment

The impacts of the costs of Phase 2 will ultimately be minimal on residential and non-residential customers of AEP Ohio. The net rate impact of Phase 2 on average for residential customers is expected to be $1.49 per month, before any reduction for operating benefits. In the same timeframe, impacts on non-residential customers are expected to be on average $6.06 before any reductions for operating benefits. Beyond year three, the amount of operational benefits that will flow through to customers (currently set at $400,000 per quarter) will be re-evaluated by an independent consultant. The net rate impacts of the Phase 2 deployment beyond year three are therefore unknown until a determination of operational benefits is made by that independent consultant.

How gridSMART® Technologies Enable the Competitive Market

In addition to the direct benefits that AMI meters provide, the data that they provide also produce benefits insofar as this information further enhances a competitive electric choice market in Ohio. AMI meters enable competition by giving CRES providers customer approved access to customer usage data that may lead to the development of innovative rates-related services. Additionally, AMI itself can serve as a necessary communication portal that may facilitate adoption of in-home energy devices that transform the manner in which customers consume energy to better align with market prices and improve the efficiency of the power system.

All AMI meters installed through AEP Ohio's gridSMART® program include industry standard communication modules that can communicate with in-home energy technologies. There are many in-home devices currently available on the market that can interface with AEP Ohio's AMI meters to allow customers access to real-time electricity consumption data. These devices can help customers better understand their energy use, and the devices can be provided as part of competitive offerings by CRES providers to help customers better manage their energy use. AEP Ohio can further support these offerings and increase customer participation through its EE and DR program offerings in this area. This is yet another way in which AEP Ohio's gridSMART® program brings value to customers and encourages the development of the competitive market.

AMI-enabled interval usage data makes TOU rates possible.

Additionally, under gridSMART® Phase 2, AEP Ohio will be able to use AMI TOU customer interval data to report CRES provider customer usage to PJM based on each customer's *actual* usage each hour, rather than an hourly estimate based on standard load shapes. In essence, this will allow CRES providers to pay capacity and energy charges based on actual customer usage, rather than based on standard load shapes. Reporting capacity and energy metrics based on actual hourly usage will allow more accurate PJM settlements for CRES providers, which enables them to reward customers for changes in their usage behavior.

Time of Use Rates

Time-of-use (TOU) rates provide many benefits to customers and the system as a whole. By charging customers different rates at different times of the day, customers can reduce their electric bills by changing their behavior so that they accomplish electric-intensive tasks during times of reduced system demand and lower market prices. For example, a residential customer on a TOU rate may reduce his or her electric bill by running certain energy-intensive appliances at night, when rates are lower. In general, this shifting of energy consumption from periods of high prices and greater system demand leads to a more efficient power system as reliance on less efficient peaking capacity is reduced, and usage of more efficient base load resources is increased.

Importantly, the benefits of TOU rates are not limited to the customers who elect these rates. When customers on TOU rates are given incentives to lower their usage during times of peak system demand, this reduces demand for the *entire* system. That can turn into lower capacity costs for *all* customers. This

reduction in system peak demand can also provide non-monetary benefits. Such benefits can include the potential reduction of greenhouse gas (GHG) emissions resulting from lower utilization of less efficient resources required to produce power during the periods of highest system demand.

Installing meters capable of measuring electric usage on an interval basis can support CRES providers in offering a diverse set of TOU-related services and fully benefit in the PJM market from customers' change in usage behavior. Standard electric meters measure only the amount of energy consumed over some period of time, and historically such meters were only read on a monthly basis. TOU rates require that the timing of energy usage is recorded and billed in accordance with the TOU rate governing service to that customer. The AMI rollout contemplated in the gridSMART® Phase 2 deployment will give CRES providers the usage data and billing detail necessary to develop an array of new TOU rates and effectively offer them to as many as 894,000 additional AEP Ohio customers. This customer usage data will be provided to CRES providers through a newly established CRES Data Portal.

Giving customers access to interval data can allow customers to better manage how they consume energy. Such data can pinpoint precisely when customers' energy usage is greatest, allowing them to recognize energy-intensive activities and change their behavior to consume electricity when TOU rates are lower. The extent to which individual customers can benefit from TOU rates depends on each customer's unique usage behavior. Consequently, giving CRES providers access to past customer usage data will allow such providers to better target new TOU products to those customers who can most benefit from such a product. This will enhance CRES providers' customer acquisition, sales, and marketing abilities, and will thus help to assert downward price pressure on the cost of energy.

CRES Data Portal

AEP Ohio has committed to developing a CRES Data Portal as part of the TOU Transition Plan. AEP Ohio has agreed to make available on this Data Portal each AMI customer's historical interval usage data in 15-minute intervals, with the customer's consent. This would enable a CRES provider to assess the customer's unique usage patterns and offer the customer detailed information about potential savings under prospective TOU rate plans. In addition to providing historical data, AEP Ohio has committed to "push" current usage data to the Data Portal on a day-after-load basis (i.e., Monday's load data will be pushed to the Data Portal on Tuesday). This will allow CRES to bill TOU customers quickly and accurately and to provide other services such as usage notifications or alternative billing periods for generation charges. The data provided will have gone through industry standard validation, estimation, and editing routines, assuring accuracy. AEP Ohio has committed to work with the Commission's Staff to ensure that the Data Portal will enable CRES providers to access customer data only with customer consent.

Insofar as TOU rates properly incentivize shifting load away from times of high prices and high demand, the development of such rate offerings to follow on the heels of the AMI rollout can help customers save money on their energy bill and improve the efficiency of AEP Ohio's power system.

TOU Transition Plan

AEP Ohio currently offers standard service TOU rates to customers who have not opted to purchase their energy from a CRES provider. However, as part of this gridSMART® Phase 2, AEP's goal is to improve the competitive landscape for CRES providers offering AEP Ohio customers new and innovative TOU rates. As part of this plan to improve competition for providing such new products and services and drive down the cost of energy to AEP Ohio customers, AEP has developed a transition plan to phase out AEP Ohio's current standard service TOU rates only after a significantly competitive TOU market exists amongst active CRES providers.

AEP Ohio's TOU Transition Plan was designed with feedback from various stakeholders to promote the development of competitive TOU rate offerings by CRES providers and to encourage existing AEP Ohio TOU customers[6] to transition to CRES TOU rate plans.

The TOU Transition Plan is proposed to follow a five-step plan, which is outlined in Figure 10 below in chronological order:

- **Step One:** AEP Ohio will propose a revised TOU tariff that will replace its current programs with a single, simplified TOU program. Once the Commission determines that the CRES TOU market is "sufficiently competitive," this tariff will go into effect.
- **Step Two:** AEP Ohio will develop initial information technology systems and processes to allow CRES providers to offer TOU rates to customers.

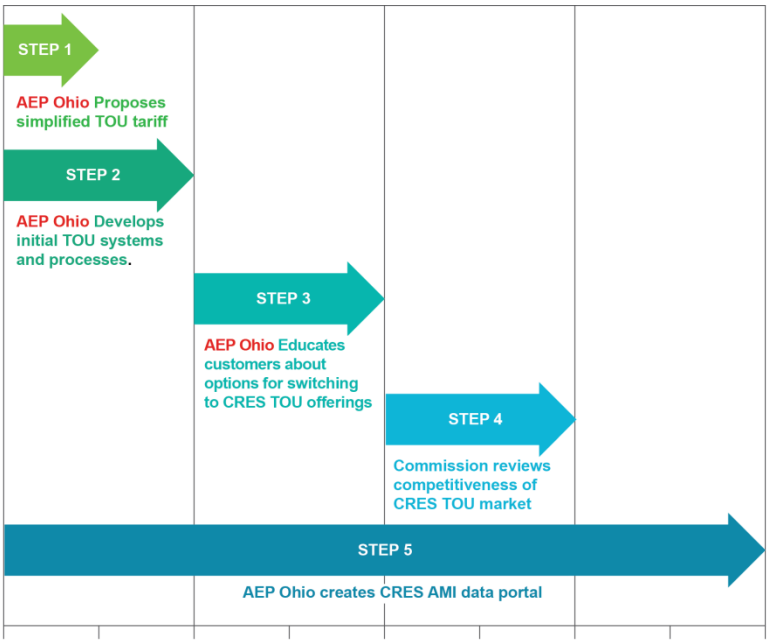

Figure 10: TOU Five-Step Transition Plan

[6] AEP Ohio currently offers AMI customers three TOU options: SMART Shift - a two-tier TOU rate, SMART Shift Plus - a three-tier TOU rate that adds a fourth tier for "critical peak pricing," and SMART Cooling - a program that provides customers a bill credit if they allow their air conditioning systems to be adjusted during times of peak demand during the summer months.

- **Step Three:** AEP Ohio will work with CRES providers to educate customers about CRES TOU offers and provide existing AEP Ohio TOU customers an opportunity to switch to a CRES TOU rate.

- **Step Four:** After the completion of Step Three, AEP Ohio and the Commission's Staff will coordinate to file a report with the Commission describing the latest data available on CRES TOU offerings to inform the decision by the Commission on whether the CRES TOU market is "sufficiently competitive." If the Commission finds that the CRES TOU market is sufficiently competitive, AEP Ohio's simplified TOU tariff filing described in Step One will be dismissed, and it will be given permission to eliminate its existing TOU tariffs. However, if the Commission finds that the CRES TOU market is *not* sufficiently competitive, the Commission will consider and approve AEP Ohio's simplified TOU tariff filing described in Step One above as a replacement for AEP Ohio's existing TOU tariffs.

- **Step Five:** Concurrent with Steps One through Four, AEP Ohio will develop a comprehensive CRES Data Portal to give CRES providers full access to customers' AMI interval data. This comprehensive Data Portal will give CRES providers the opportunity to offer new and creative TOU rates based on the CRES provider's view of what customers want and would enroll in.

Customer Outreach Efforts

The gridSMART® technologies are anticipated to be widely accepted by customers. Customers who participated in gridSMART® Phase 1 and participated in AMI-enabled consumer programs rated their overall satisfaction with AEP Ohio 7 percent higher than did AEP Ohio customers overall. This was partly a result of a well-designed and coordinated strategy to engage customers.

The Phase 1 education plan included door hangers, telephonic communications, and other mailed information, in addition to the development of a highly visible customer education and outreach mobile unit (see Figure 11). The efforts AEP Ohio employed in launching the customer education and outreach component of Phase 1 were shared with and replicated by other utilities around the country deploying similar programs to gridSMART®.

Figure 11: AEP Ohio's gridSMART® Mobile Learning Center

A similar public outreach and education plan will play a key role in the successful implementation of Phase 2, albeit with a new communications theme that the technologies being deploy in Phase 1 were chosen largely due to benefits realized during Phase 1.

Similar to the successful strategy used in Phase 1, a multi-pronged communications approach will engage key community thought leaders, customers and other targeted audiences by providing timely and thorough information regarding the overall project, timeline, rollout and benefits of the technologies. An

outreach plan that clearly communicates transparency to communities and customers will be developed and used to ensure acceptance, which ultimately will lead to higher customer satisfaction.

At a high level, many of the lessons learned through the development of the Phase 1 customer outreach and education campaign will be applied to the deployment of Phase 2. However, the demographics of the customers who will be the focus of Phase 2 will be different from those of Phase 1. On average, Phase 2 customers will come from more rural areas than the customers of Phase 1, and AEP Ohio expects to adapt its outreach and educational campaign accordingly. Given the lower density of populations targeted under Phase 2, AEP Ohio may not place as much emphasis on in-person educational events as under Phase 2. Further, in the time since Phase 1, social media has emerged as a key form of communication for utilities, and will be substantially leveraged in mobilizing outreach to the customers of Phase 2.

Utilities across the U.S. have reported strong acceptance of Smart Grid technology.

- **Sacramento Municipal Utility District (SMUD)** has deployed approximately 600,000 AMI meters and has reported high customer satisfaction. As SMUD reported, "Customer satisfaction drove the project. Throughout, SMUD maintained customer satisfaction levels in the mid-90th percentile. Ongoing surveys measure customer satisfaction with the meters, the installation process and the associated communications. The complaint rate was only 0.09 percent."
- **Oklahoma Gas & Electric (OG&E)** has deployed approximately 780,000 AMI meters and has enrolled over 117,000 participants to its AMI-based dynamic pricing demand response program called SmartHours. In the most recent survey, 94 percent of customers said they were likely to recommend the program to friends and family.
- **Memphis Light Gas and Water (MLGW)** conducted a survey after its AMI pilot with "95 percent saying they would recommend the smart meter experience to a friend."

At a macro level, JD Power and Associates reported higher customer satisfaction with AMI. They found that customer satisfaction among customers with smart meters on their homes "averages 667 (on a 1,000-point scale), 43 points higher than among customers whose homes are not equipped with smart meters." For business customers with a smart meter installed, satisfaction averages 734, which was 85 points higher than for business customers without a smart meter." As a specific point of reference on the satisfaction customers maintain regarding the AMI deployment, out of the 150,000 AMI meters installed under Phase 1, only 12 customers opted out of the meter installation.

Assurance of Cybersecurity and Privacy

Customers can be assured that the security of their information is protected by extensive and dedicated resources. Through the gridSMART® Phase 1 deployment, AEP Ohio implemented innovative cybersecurity programs, including establishment of a state-of-the-art Cybersecurity Intelligence and Response Center (CIRC), shown in Figure 12. Twenty-four hours a day, seven days a week, CIRC staff monitor the grid and communications networks, attempting to identify cybersecurity vulnerabilities and threats. The AEP CIRC is recognized as an innovator in the industry for its threat monitoring and protection functionality. AEP's CIRC continuously gathers and shares threat information with peer utilities and government agencies.

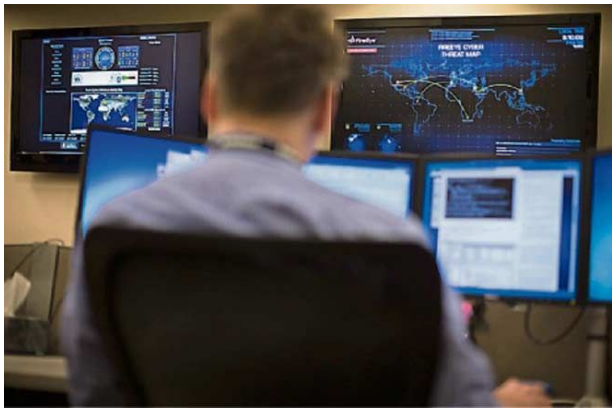

Figure 12: AEP Ohio's State-of-the-Art CIRC

The proposed gridSMART® Phase 2 deployment will maintain these efforts and continuously improve security protection. AEP Ohio will utilize dedicated security and privacy experts to review the technology and equipment to ensure strict standards are met. Emphasis will be placed on building security into the deployment as well as creating a system to ensure that these standards are maintained as the technologies go into service. AEP Ohio has agreed to provide annual verbal briefings in a roundtable setting on cybersecurity issues to the PUCO and key members of the Commission's Staff.

Security and Privacy

AEP Ohio notes that the issue of customer privacy is not a new concept introduced by the deployment of the smart grid. The electric utility industry in Ohio has traditionally collected, used, and protected significant amounts of sensitive customer information. For example:

- The nature of information necessary to conduct utility business includes personally identifiable information (PII) such as social security numbers and related credit information.
- Utilities have routinely collected interval metering information for decades for larger commercial and industrial customers as part of administering and billing tariffs that rely on such information and for operating its business.
- Interval metering data on select residential and smaller commercial and industrial customers has been collected and utilized for decades in order to develop and monitor customer load profiles necessary for system resource planning and the proper allocation of costs. This data is not substantially different than that which is collected by newer smart meters.
- The current legislative and regulatory rules provides for protection of customer data privacy, regardless of how that information is gathered by the utility. AEP Ohio treats customer consumption

data collected through the smart grid with the same high level of protection required by these legislative and regulatory expectations.

Therefore, the collection, use, and protection of proprietary and confidential data have occurred in some form almost since AEP Ohio's inception. The Company has always fulfilled the obligation to maintain the confidentiality of this information, as well as the trust of their customers, without notable exception. The Company is supportive of the PUCO's efforts to ensure the protection of customer information, and AEP Ohio looks forward to continuing to engage in any further PUCO proceedings on the topic.

Enabling Renewable and Distributed Energy Resources

Distributed Energy Resources

AEP Ohio is committed to promoting cleaner energy and customer participation through distributed energy resources (DER). For example, the company updated and submitted the Minimum Requirements for Interconnection Service to reflect the recent revisions to Rule 4901:1-22, OAC Interconnection Service in May 2016. Furthermore, the company met with PUCO Staff to discuss the growing issue of customers on the net metering tariff with excessive energy production and our proposed plan to work with them to resolve the situation. AEP Ohio continually meets with PUCO Staff to discuss the emerging issues related to the net metering tariff, and intends to work with PUCO Staff to provide updates and quantitative data that will be beneficial to rule revisions in the future. In 2015, updates to its interconnection webpage were made to make it more user-friendly. Additional updates will be implemented in 2016, which will enhance the DG interconnection process and better educate customers about DG and net metering in accordance with the recent revisions to Rule 4901:1-22, OAC Interconnection Service and pending revisions to Rule 4901:1-10-28, OAC Net Metering.

gridSMART® Phase 2 activities augment AEP Ohio's current DER initiatives as deployment of these technologies can advance DER installations. The proliferation of AMI meters will allow for more robust and accurate data to assess and evaluate opportunities with DER. Specifically, AMI data will enable CRES providers to develop products or services that support net metering while allowing them to receive compensation based on real-time locational market price. Additionally, this new trove of data will enable the market to compete on innovative product and services which will lead to more DER-related products and services in the market. AMI can also provide data to the utility around how, when, and where the installation of DER may address capacity and/or reliability issues on the distribution system. Accessing such data will allow AEP Ohio to implement specific investments that can improve the reliability of the distribution system with targeted installation of DER where it is most beneficial.

> ***AMI data will enable CRES providers to develop products or services that support net metering while allowing them to receive compensation based on real time locational market price.***

VVO deployment can also achieve some of the same environmental goals as deployment of renewable energy technologies, as VVO enables for the use of lower amounts of energy in operating the distribution system, leading to lower GHG emissions. To be clear, VVO technologies are not explicitly designed to improve the ease with which renewable energy is integrated onto AEP's system. However, installing VVO can lead to a more efficient operation of the generation grid, and a corresponding reduction in GHG emissions.

Plug-In Electric Vehicles

AEP Ohio recognizes that the Plug-in Electric Vehicle (PEV) market is expanding rapidly and wants to provide its customers enhanced options to help encourage the adoption of PEVs. To support the adoption of PEV's and further economic development in Ohio, AEP Ohio has recently partnered with the City of Columbus in its bid to obtain Smart City Challenge grants from the U.S. Department of Transportation

(DOT) and the Vulcan Foundation with a program component to encourage PEV proliferation throughout Columbus.

Dialogue with the City of Columbus can help inform the structure of the program for smart charging technologies to manage load during peak times and on high-demand circuits as well as work toward establishing rates for PEVs. With the rapid evolution of PEV technology and consumer market, further development will be required for developing guidelines for charging options, rate plans, and rebates. For example, the Company has in the past offered a special PEV TOU rate that was combined with a rebate ($2,500) for a level-2, AEP-approved PEV charger. Also through the Smart City challenge, considerable economic development may be created by encouraging PEV purchases by millennials and customers who are early adopters of the PEV technology.

AEP Ohio understands that some of the factors driving the increase in PEV adoption are increased vehicle range, enhanced charging options, and more affordable vehicles available. Other factors such as policy changes, renewed incentives, and automakers assistance with infrastructure deployment are also contributing to PEV adoption. Recognizing these drivers, AEP Ohio desires to pursue AEP Ohio-owned PEV charging stations across strategic parts of our service territory, targeting commercial, industrial, and multi-family residential locations. AEP Ohio will also develop new customer programs specific to PEVs. AEP Ohio also wants to consider deployment of PEV charging infrastructure to address obstacles for residents of multi-family housing and workplaces subject to the need to balance load, mitigate grid congestion, and reduce on-peak demand.

Conclusion

AEP Ohio's gridSMART® initiative is helping the Company improve reliability, lower energy consumption, and reduce costs. Based on valuable experience gained from a more limited deployment of a suite of technologies during Phase 1, AEP Ohio's focus on a larger deployment of specific technologies—AMI, DACR and VVO—will extend the benefits demonstrated in Phase 1 and deliver additional benefits to a broader set of customers.

AEP Ohio expects to derive significant financial benefits from AMI through lower labor costs and other efficiencies. It will also enable a variety of additional benefits insofar as customer satisfaction is improved, field personnel safety is enhanced, and environmental impacts are reduced. AMI also will help enable DR and CRES providers to offer valuable customer programs, which can facilitate a more competitive marketplace for innovative energy products and services.

DACR will help improve reliability where the systems are deployed by improved outage identification and restoration times and will enhance storm hardening. Industry standard reliability metrics such as SAIFI, SAIDI, and CMI are all expected to improve on the back of DACR deployment, which will help avoid millions of dollars of potential lost economic productivity.

VVO will help optimize the operation and efficiency of targeted circuits via intelligent control and the application of communications technology. This will lower energy consumption significantly, leading to lower energy production costs. This translates directly to customer energy cost savings.

Enabling renewable and distributed energy resources and collaborating with the City of Columbus to improve PEV charging infrastructure will promote customer participation in clean energy and smart transportation alternatives in support of the City's sustainability planning.

AEP Ohio plans to deploy these technologies in a staged approach over the next seven years. Based on its positive experience with customers during Phase 1, AEP Ohio intends to build on its successful customer education and outreach strategy to effectively communicate its deployment plans to customers.

AEP Ohio's analysis of the costs and benefits of deploying these technologies demonstrates the value such technologies offer to AEP Ohio's customers. Overall, the impact of the Phase 2 deployment on residential and non-residential customers' electric bills is expected to be minimal. However, this investment is expected to yield benefits that exceed costs by twofold on a net present value basis.

Importantly, deployment of these technologies will support the competitive electricity market in Ohio. Robust data from AMI meters will enable innovation by CRES providers that will lead to more DER-related products and services in the market. AMI can also provide data to the utility around how, when, and where the installation of DER may address capacity and/or reliability issues on the distribution system, which can lead to more renewable energy on the grid.

AEP Ohio's gridSMART® Phase 2 project, based on proven and accepted technology solutions, will achieve significant benefits for AEP Ohio's customers.

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Summary: Report -AEP Ohio's Grid Modernization Report electronically filed by Mr. Steven T Nourse on behalf of Ohio Power Company