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DE-OHIO EXHIBIT_____

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

In The Matter of the Application of Duke Energy Ohio for Approval of an Electric Security Plan	)))	Case No. 08-920-EL-SSO
In the Matter of the Application of Duke Energy Ohio for Approval to Amend Accounting Methods	)))	Case No. 08-921-EL-AAM
In the Matter of the Application of Duke Energy Ohio for Approval of a Certificate of Public Convenience and Necessity to Establish an Unavoidable Capacity Charge	)))))	Case No. 08-922-EL-UNC
In the Matter of the Application of Duke Energy Ohio for Approval to Amend its Tariffs	)))	Case No. 08-923-EL-ATA

DIRECT TESTIMONY OF

TODD W. ARNOLD

ON BEHALF OF

DUKE ENERGY OHIO

July 31, 2008

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I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS?

A. My name is Todd W. Arnold. My business address is 139 East Fourth Street, Cincinnati, Ohio 45202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by the Duke Energy Corporation (Duke Energy) affiliated companies as Senior Vice President, SmartGrid and Customer Systems.

Q. PLEASE BRIEFLY DESCRIBE YOUR JOB DUTIES AS VICE PRESIDENT, SMART GRID AND CUSTOMER SYSTEMS.

A. As Vice President, Smart Grid and Customer Systems, I am responsible for the SmartGrid strategy, deployment planning and implementation, as well as the customer and meter data management systems.

Q. PLEASE BRIEFLY DESCRIBE YOUR PROFESSIONAL AND EDUCATIONAL BACKGROUND.

A. I received a Bachelor's Degree in Marketing from Indiana State University in 1977 and a Master's Degree in Business Administration from the University of Indianapolis in 1986. I began my career with Public Service Indiana (PSI) in 1977 in field sales and marketing. I have served in many customer operations, distribution operations and corporate office capacities. I have my "Strategic Leader" professional certification from the Call Center Industry Advisory Council (CIAC). CIAC is a not for profit corporation established by the call center industry to provide standardized competency-based professional certification for call center leaders. I am currently a member of the Board of Directors of People

Working Cooperatively.

Q. PLEASE SUMMARIZE YOUR WORK EXPERIENCE.

A. I have over 32 years of utility experience including field operations, customer service, strategic planning, system implementation, process reengineering and merger integration. Prior to my current position, I was Senior Vice President, Customer Service for Duke Energy, responsible for call center operations, billing, credit and collections and meter data management for Duke Energy's affiliated operating companies.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to provide a detailed description of (1) the equipment to be installed for Duke Energy Ohio, Inc's (DE-Ohio) SmartGrid initiative; (2) the near-term functionality and future functionality of the SmartGrid equipment; (3) the customer service benefit of the functionality; (4) the estimated costs associated with the project; and (5) the proposed deployment schedule for the SmartGrid initiative. My testimony also explains what a "smart grid" is, and summarizes the work that Duke Energy has done with smart grid technology over the past few years.

II. OVERVIEW OF DE-OHIO'S SMARTGRID INITIATIVE

Q. WHAT IS SMARTGRID?

A. SmartGrid is the new name for the Duke Energy's Utility of the Future project to transform its gas and electric transmission and distribution system into an integrated, digital network – much like a computer network – to produce operating

efficiencies, enhanced customer and utility information and communications, innovative services, and other benefits. One fundamental component of the SmartGrid project is Advanced Metering Infrastructure (AMI). AMI is a metering and communication system that records customer usage data over frequent intervals, and transmits the data over an advanced communication network to a centralized data management system. The usage data is made available to the utility and customers on a frequent and timely basis. The SmartGrid project uses the communication network to carry data from AMI and other intelligent devices on the distribution grid, creating a networked system and utilizing the AMI to its greatest extent.

SmartGrid, however, is not limited to AMI metering. The possibilities with SmartGrid technologies are infinite as it is continuously evolving much like the internet has evolved over time. SmartGrid is much more than simply the functions it is capable of performing. It is an open architecture integration of the electric distribution system which will provide capabilities and/or a platform for emerging technologies.

III. DE-OHIO'S VIEW OF A "SMART GRID"

Q. HOW DOES DE-OHIO VIEW THE DIFFERENCES BETWEEN A "SMART GRID", "ADVANCED METERING INFRASTRUCTURE" AND "AUTOMATIC METER READING"?

A. From DE-Ohio's perspective, these three categories are on the same general spectrum of service and functionality with automatic meter reading (AMR) being the most basic, a smart grid being the most complex and functional, and advanced

metering infrastructure ("AMI") somewhere in between. AMR generally includes remote access to the meter, monthly kWh reads, interval data, and basic theft, outage and restoration detection. AMI typically allows for on demand meter reads, programmable load intervals, bi-directional and net metering, time-of-use and real time pricing options, and demand response capabilities. DE-Ohio's vision of a "smart grid" provides not only the metering options of AMR and AMI, but also enhanced options such as web-based applications for our operating personnel, remote and continuous collection of power quality data, remote programmability, and energy management services, along with distribution system automation components.

IV. DE-OHIO'S INVESTIGATION OF SMARTGRID TECHNOLOGIES

Q. PLEASE DESCRIBE DE-OHIO'S EFFORTS IN DECIDING TO INVEST IN SMARTGRID TECHNOLOGY.

A. Duke Energy began investigating the development of a data management system in 2004. Initially, the purpose was to gather and correlate data on generation characteristics, outages, transmission loading, distribution system constraints and meters, and then use that data to better optimize Duke Energy's system and employee work loads. The investigation led to the determination that Duke Energy was not gathering the data frequently enough or in sufficient quantities to perform system and employee optimization analyses. Near that same time, DE-Ohio was also considering the possibility of an AMR project using a power line system in its Midwest region.

In 2006, Duke Energy initiated an internal working group consisting of every operational area of DE-Ohio (except for generation) tasked with putting together "use cases" designed to describe what technology DE-Ohio needed to accomplish this initiative and how DE-Ohio wanted to provide service and use products in the future. Approximately 18-20 "use cases" were developed in conjunction with a consultant, KEMA, Inc., hired to assist DE-Ohio with this endeavor. KEMA's staff analyzed and shaped the "use cases" using information from peer companies, and helped to determine what technology would be needed in order to accomplish the goals of each use case.

Once DE-Ohio determined the actual technologies needed to bring its vision for the future (as set forth in its "use cases"), vendors of metering, behind-the-meter and communication products were surveyed to assess their product offerings and to compare to DE-Ohio's functional requirements. In July of 2007, Duke Energy hosted a full-day meeting with the vendors at which DE-Ohio set forth its vision and then asked the vendors to submit proposals. It quickly became apparent that what DE-Ohio wanted to accomplish with its SmartGrid initiative was unique enough that none of the vendors' proposals met the needs of DE-Ohio. For instance, Duke Energy's vision was to have interoperable metering endpoints which would work with any communication system, and what was offered were metering endpoints that only connected to proprietary communication systems. Therefore, we selected a few firms that were closest to meeting our needs and have been working with them to move toward full compliance with our requirements and vision. Due to the nature of technology development in the

smart grid area, Duke Energy did not pursue a traditional specification document from which vendors could bid, but instead opted to select vendors that were most willing to work with us to best achieve our goals. Duke Energy is continuing to work with several vendors to best implement its vision of DE-Ohio's future in this area. At this point, we have developed an architecture that allows us to minimize the proprietary communications networks and increase the long-term flexibility of the "smart grid." The process of developing technology and vendors will be an ongoing process; however, we have narrowed our initial vendor list to Echelon for metering, Verizon for backhaul communications and Ambient to assemble the communication nodes required to interface with the endpoints and the Verizon network.

Q. DID DUKE ENERGY DETERMINE THAT CERTAIN TECHNOLOGIES WERE NOT APPROPRIATE AFTER EXAMINATION?

A. Yes. Duke Energy considered and discarded several technologies before deciding on its current proposal. For example, Duke Energy examined broadband over the power lines (BPL), but has found the equipment susceptible to disturbances on the power line. We continue to evaluate BPL technology and are working with vendors to stabilize the technology.

Another technology reviewed by Duke Energy is a "Radio Mesh network." Mesh networks originated in the military and uses radios that can speak both to one another and to a "mother" radio. In the utility setting, there would be a radio at each endpoint (meter) that would be able to communicate with each other and with the "mother" radio. The systems designed for the military were mainly

utilized in the mobile environment and proved to be very reliable because as the devices moved, they always had multiple paths for communication back to "mother." However, Duke Energy believes that the challenges with the Mesh network operating in a non-mobile environment, primarily in unlicensed spectrum over a very large footprint are significant. First, the radios cannot transmit data across large distances, which would be a challenge given DE-Ohio's expansive rural service territory areas. Second, the radios operate in an unlicensed spectrum, which means that cordless phones, baby monitors, remote controls, etc. all occupy that same space and often interfere with each others' signals. Since the spectrum is unlicensed, interference mitigation can be costly and unpredictable. Duke Energy is still evaluating the option of utilizing some of the Mesh technologies as a fill in where cellular providers do not have service and expansion of the networks is not likely.

Q. HAS DUKE ENERGY CONSULTED WITH INDUSTRY GROUPS ON ITS SMARTGRID VISION?

A. Yes. Duke Energy has consulted and collaborated on its SmartGrid initiative with the Electric Power Research Institute (EPRI), the research and development arm of the electric utility industry. Duke Energy is working on approximately twelve (12) projects under EPRI's "Intelligrid" umbrella.

Duke Energy has also been working with the Gridwise Architectural Council and Gridwise Alliance, which were formed by the Pacific Northwest National Lab and the U.S. Department of Energy to focus on researching the future of the smart grid. The focus of the Gridwise Architectural Council is on

standards, i.e. how communication systems work together and the benefits of meters using the same "language." The Gridwise Alliance is involved in developing policies and standards at the state and federal levels. Duke Energy personnel are also involved in many other organizations that may have "smart grids" as a subset of their main focus, and participate in the internal development of Duke Energy's SmartGrid.

Representatives from Duke Energy have been involved with several conferences and seminars relating to smart grid investments. Utilimetrics (formerly AMR Associates) and Distributech hold annual conferences and trade shows in which Duke Energy participates in order to keep up-to-date on new developments in technology.

Q. HAS DUKE ENERGY PARTICIPATED IN ANY GOVERNMENTAL INITIATIVES RELATING TO SMART GRIDS?

A. Yes. Duke Energy has monitored the Department of Energy's (DOE) Modern Grid Initiative and frequently participates in venues to help shape the definition, direction and policy setting of this group. Duke Energy personnel also contribute, through trade associations, material to be considered in defining the smart grid, as well as setting national policy through the DOE. Duke Energy has also applied for funding for a few smart grid-related projects from DOE, but has not been selected to date.

V. CUSTOMER SERVICE BENEFITS OF SMARTGRID

Q. WHAT TYPES OF CUSTOMER SERVICE OFFERINGS WILL BE ENABLED BY THE SMARTGRID INITIATIVE?

A. Through the SmartGrid initiative, infrastructure will be installed that will enable DE-Ohio to provide a variety of new service offerings. The service offerings resulting from the SmartGrid initiative cross a broad spectrum.

Q. HOW WILL SMART GRID IMPROVE CUSTOMERS' BILLING?

A. Customers will receive more accurate bills due to the increased accuracy of the meter readings. In addition, DE-Ohio will know sooner when meters are not working or functioning properly; thereby, allowing DE-Ohio to fix any faulty meters and minimize the impact on a customer's bill. Also, tamper and theft situations will be detected sooner, because error messages are sent when a meter is pulled from its base and/or plugged back in. High bill inquiries will be resolved faster and customers will feel more confident about the information, because of the ability to review data on a daily basis. In addition, there are currently situations when we are unable to access the meters. With over a third, or over 400,000, of DE-Ohio's gas and electric meters inside, it is difficult to get monthly reads to provide an accurate bill. In these situations, DE-Ohio sends an estimated bill. In 2007, DE-Ohio estimated over 1.1 million bills. Customers often question the validity of an estimated bill. Also, when a bill is estimated too low, customers are not happy when they have to pay a higher bill to make up for an underestimated bill from the prior month/months. With this new technology,

estimated bills will be significantly reduced, enabling us to provide a more positive customer experience.

Q. HOW WILL DAILY USAGE INFORMATION IMPROVE THE CUSTOMERS' EXPERIENCE?

A. It is standard for electric and gas utilities to bill the customer based on a monthly meter read that takes a recent reading and subtracts the prior month's historical read. These historical monthly billings result in the customer receiving a bill for which the utility and the customer have very little understanding of what usage caused that bill. This is equivalent to you receiving your monthly VISA or MasterCard bill and only being able to see the total. How could you understand your monthly credit card bill if you could only see the total and not each individual charge? SmartGrid provides the start to removing the mystery from the monthly utility bill.

This will begin with us being able to provide customers their daily usage. When a customer calls our customer service representatives with a question on their bill, the customer service representative will also have the daily usage information available to facilitate answering questions customers have about their bill.

We are making available to our DE-Ohio customers this summer a product called Energy Analyzer. It combines the customer's individual usage history with external weather data to provide information on how weather has impacted their usage. If the customer completes a short survey regarding their home's structure and their energy habits, it will then provide analysis that yields information on

how they have impacted their usage and what they can do to save energy. It would be our intent to eventually upgrade this tool to use the daily information to provide an even better energy analysis.

We believe SmartGrid will be the foundation for technology that is being developed that will enable customers to have more granular information at the device or appliance level.

Q. WHAT OTHER TYPES OF CUSTOMER SERVICE BILLING OFFERINGS COULD BE ENABLED?

A. The Company would also be enabled to offer customers prepaid metering, and other flexible billing options. Customers expect a variety of options and there are features of prepaid metering that are attractive to some customers. Prepaid metering would eliminate the need for a security deposit, there would be no need to run a credit check, and customers would not have to worry about late fees. SmartGrid provides the foundation to evaluate shorter term billing periods for our customers such as weekly or bi-weekly billing tied to direct debit from their banking account.

Q. ARE THERE ANTICIPATED BENEFITS FOR DE-OHIO'S LOWER-INCOME CUSTOMERS?

A. Yes, SmartGrid technology can provide our lower-income customers with more options to help them manage their electric bill. The SmartGrid technology will also benefit our lower-income customers through enabling prepaid metering. By selecting prepaid metering, customers can eliminate having to pay a security deposit, they can better manage their budget by being able to "pay as they go," and

this option also eliminates late fees. Also, for customers who select the prepaid option, we foresee fewer customers being disconnected for non-payment. This is because these customers will have a set amount on their prepaid card versus receiving a bill after service is already received and being surprised by a higher than expected amount.

The special assistance agencies can also expedite service to our lower-income customers by having prepaid cards to give directly to customers. Instead of having to prepare vouchers and then notifying DE-Ohio that they are helping a customer, the agency can provide a prepaid card directly to the customer who can receive the credit to their account by calling Duke Energy Ohio's Interactive Voice Response (IVR) or by visiting a pay agent.

Since the SmartGrid technology will enable DE-Ohio to communicate with its customers in new ways, it will be able to notify lower-income customers via text messages, cell phones, emails, or outbound IVR messages of pertinent information. An example of a message DE-Ohio could send to its lower-income customers is a notification of the availability of programs, services or financial assistance. When the social service agencies have assistance available, DE-Ohio could send a message through the customer's preferred communication channel to let them know funds are available and how to go about obtaining them. We also can send alerts regarding daily usage.

Another benefit SmartGrid technology will provide to our lower-income customers is that DE-Ohio can design a service option to allow customers to identify a dollar threshold that they want to manage to each month. The

technology would allow us to monitor customers' electric usage and notify them at specified times throughout the month if their electric usage and dollar amount used fall within their threshold amount or it is estimated to be higher or lower based on where they are at that time. By being more aware of their electric usage throughout the month, customers can adjust their usage to better manage their bills to the amount they would like to spend that month.

DE-Ohio also sees the technology enabling remote disconnects and reconnects as helping its lower-income customers. Because service orders will be worked more timely, customers will not be able to get as far behind. As accounts become eligible for disconnection due to non-payment, DE-Ohio would utilize customers' preferred communications channels to make them aware and provide options for retaining service.

Q. PLEASE DESCRIBE HOW SMARTGRID IMPROVES THE STARTING AND STOPPING OF THE CUSTOMERS'S SERVICE?

A. We will no longer require a field trip or an appointment for those customers with inside meters to be home, when a customer requests a read to discontinue service in their name and begin service in another customer's name. In 2007, we completed over 200,000 succession reads, for gas and electric service. With a third of our meters inside the premise, you can assume close to 70,000 of these required appointments for the customers to be on premise. With SmartGrid, we can work the transfer of service on any day of the year since we can obtain the read remotely.

Another example is remote electric disconnects and reconnects, which provide more flexibility for our customers and DE-Ohio. By having the remote disconnect and reconnect capability, customers with an inside electric meter will not have to be on the premise, in order for us to turn their electric service on or off. In 2007, we completed 100,000 reconnects and 110,000 disconnects. With over a third of our meters inside it is safe to assume that we set an appointment that required the customer to be on premise during at least a four-hour appointment window of time on over a quarter of these orders. Customers who have both electric and gas service will continue to require a field trip to connect or disconnect the gas service. However, we can go ahead and perform the electric service reconnect or disconnect at a more immediate time of their convenience and continue our practice of setting an appointment for the gas service.

Q. WHY ARE REMOTE RECONNECTS AND DISCONNECTS A BENEFIT TO CUSTOMERS?

A. The ability to remotely reconnect and disconnect electric service should provide a more positive customer experience because customers with inside meters would not have to be on premise for us to complete service requests. As stated earlier, the remote disconnect and reconnect functionality enables us to complete the customer's service request to match their schedule.

Q. WOULD THE ABILITY TO REMOTELY DISCONNECT AND RECONNECT CUSTOMERS ALSO BENEFIT DE-OHIO?

A. Yes. We expect this to ultimately reduce our costs related to meter reading, customer service calls and call center operations. The remote disconnect and

reconnect capability will eliminate the need to make a trip to the customer's premise, thus reducing costs for field visits and employees for this work. It will also empower our call center representatives by allowing them to respond to customers' service requests quickly because they will have access to the latest reads. Today, when a customer calls and we want to validate the billing read we must send a meter reader to obtain a special read to validate the read. Once this technology is fully deployed, we will no longer need to send a meter reader to the customer's premise, also saving costs. Another benefit to DE-Ohio is the ability to disconnect service in a timely manner for those customers who do not pay their bill. This will help reduce our receivables and charge-offs for unpaid service. While our goal is to provide service to our customers, there are situations where we are forced to disconnect service for non-payment. And when customers are able to pay enough to be reconnected, we can reconnect their electric service very quickly.

No longer needing to have personnel access the premise to obtain a read or access the premise to disconnect and reconnect an electric meter will reduce personnel injuries as inside the premise meters tend to have a higher incidence of accidents.

Q. WHAT TYPES OF CUSTOMER COMMUNICATIONS WILL BE ENABLED BY THE INTELLIGENT METERS?

A. Customers will have options to receive communications from us through their preferred method such as displayed on their account web page, text messages on

their cell phone, e-mail, automated outbound phone messages, or in-home digital display devices.

An example is proactive outage communication. The SmartGrid technology includes smart or intelligent meters and new communication capabilities. As mentioned earlier, with smart meters, the Company may know that a customer's power is out before the customer. Instead of relying on customers to call the Company when their power is out (which is how our current outage system works), we will already know, because the system will monitor and send error messages when it detects no power. Not only will this allow us to notify customers when power is out, but it will also allow us to determine the cause of outages sooner, enabling us to restore service faster than we do today.

DE-Ohio will have the ability to provide customers daily usage information. Additionally, DE-Ohio could forecast an individual customer's monthly usage based on mid-month data, weather, and applicable rates and provide the customer with information that will help them better manage to their budget. By leveraging this information the customer will no longer be surprised about how much energy they used when they receive their bill. They will be able to proactively monitor their usage and make the decision to manage their usage throughout the month.

Q. HOW WOULD IT BENEFIT A SMALL BUSINESS CUSTOMER TO RECEIVE A TEXT MESSAGE THAT THE POWER AT ITS BUSINESS LOCATION WAS CURRENTLY OUT?

A. A number of small businesses are not staffed twenty-four hours per day, seven days a week. In these situations, the notification to the appropriate person that the power is out could help with scheduling the workforce the following day, identifying to the owner that electronic processing may not be occurring, that refrigeration is out, or anything related to their specific business that requires electricity. This proactive notification will allow them time to activate back-up plans and better manage their situation. In addition, a text message that the power has been restored would prevent the owner from having to check in at their business or from having to call the Company.

Q. HOW WILL DE-OHIO BENEFIT FROM THE NEW TECHNOLOGY INSTALLED IN THE SMARTGRID INITIATIVE?

A. Service requests will be worked as requested through the remote disconnect and reconnect process, eliminating callbacks from customers checking on the status of their service request. The significant reduction in estimated meter readings will reduce billing calls and the number of re-billings our customer service representatives must complete. We expect this to ultimately reduce our costs related to meter reading, customer service calls and call center operations.

Q. WILL DE-OHIO MAINTAIN THE PRIVACY OF ITS CUSTOMERS, EVEN WITH ACCESS TO ADDITIONAL DATA THROUGH SMARTGRID TECHNOLOGY?

A. Yes. Even with the enhanced capability to collect customer-related data, DE-Ohio remains committed to the privacy of its customers, and its customer privacy policies will continue in force. All employees or Vendors that have access to Duke Energy's personal information must comply with the consumer protection provisions of R.C. Chapter 1349, Duke Energy's Personal Identifiable Information (PII) Privacy policies and all other applicable data privacy and data security laws, regulations and Duke Energy policies and procedures.

VI. INTELLIGENT METERS

Q. HOW DOES DE-OHIO CURRENTLY OBTAIN ELECTRIC METER READINGS?

A. DE-Ohio currently obtains electric meter readings through monthly meter readings by meter readers; and meter readings submitted by customers by phone or through DE-Ohio's website. Most meter readings are monthly meter readings obtained by meter readers. DE-Ohio uses over 190 meter readers who walk routes once per month to read the meters. The meter readers either automatically record, or manually key in, the usage data into a handheld electronic storage device. The stored usage data is transmitted to DE-Ohio's billing system daily.

One of the main challenges for DE-Ohio's meter reading operations is obtaining access to inside meters located primarily in urban areas of DE-Ohio's service territory. With over a third, or over 400,000, of DE-Ohio's gas and electric

meters inside, it is difficult to get monthly reads to provide an accurate bill. DE-Ohio maintains a "key room" containing over 60,000 keys to customers' homes, where the customers voluntarily provided DE-Ohio with a keys to enter the customers' homes to perform the monthly meter readings in case the customer is not at home when the meter reader arrives. Most customers, however, refuse to give DE-Ohio a key to enter their home or business. In such cases, if the meter reader cannot enter the home or business to read the meter, DE-Ohio allows the customer to record the meter reading on a postcard left at the premises; to enter the meter reading online; or to call the meter reading into the Company's Call Center. Approximately 8% of Ohio bills (residential and non-residential are estimated each month due to our inability to enter the customers' premises to read the meter. In 2007, DE-Ohio estimated over 1.1 million bills. This results in a significant number of Call Center calls, customer complaints and costly off-cycle meter readings.

Q. PLEASE BRIEFLY DESCRIBE THE INTELLIGENT METERS DE-OHIO IS PROPOSING TO INSTALL.

A. DE-Ohio is proposing to install intelligent meters with two-way communications. These intelligent meters will allow DE-Ohio to read meters remotely, remotely connect and disconnect electric service, verify power outage/restoration, and engage in increased theft protection measures. DE-Ohio will also eventually be able to send control information back through the communication system, using meter data as a basis to cycle the air conditioners and schedule use of power-heavy appliances depending on market signals and customer preferences. These meters use the power lines for a communication medium from the meter to the

transformer. At the transformer the meter data is then delivered using a public wireless carrier, currently we anticipate using Verizon.

Q. WHAT KIND OF DATA WILL THESE NEW METERS BE ABLE TO SEND TO DE-OHIO?

A. The new meters will be able to collect data regarding usage, ranging in frequency from every five minutes to daily reads for both energy and demand readings. The meters will also be able to collect and store other metrics (such as voltage, kilo-watt hour (kWh), energy data), providing us with more data points. The meters will also be capable of net-metering.

Q. WHY IS DE-OHIO INTERESTED IN COLLECTING THIS DATA?

A. DE-Ohio would be better prepared to update its load forecast with access to this data. DE-Ohio would also be able to look back at the load profile for a home on an hourly basis for several days for trouble-shooting purposes. This information could be provided to customers concerned about their levels of usage. Information from the "end points" of the system will also be combined with data from other distribution assets to better plan for growth, asset management, restoration services, etc. Generation capacity planning will also be enhanced by gathering more granular consumption data over weeks and months.

Q. WHAT OTHER OPTIONS WILL THESE NEW METERS ENABLE FOR DE-OHIO?

A. The data collected and transmitted through the intelligent meters will provide new operational efficiencies. Restoration of service after an outage will be more rapid.

DE-Ohio will be able to trouble-shoot network problems using the network versus visual inspection. This will also reduce crew time in the field.

The intelligent meters would also enable DE-Ohio to limit its amount of load in an emergency. The meters will enable DE-Ohio to increase its energy efficiency offerings, provide for larger-scale distributed generation and maximize load control potential.

DE-Ohio would also be able to enhance customer service. DE-Ohio would be able to obtain special reads for customers calling in with questions about their meters, usage or billing. Customer-sited generation can be net metered on a larger-scale.

Q. HAS DE-OHIO MADE A FINAL DETERMINATION REGARDING THE VENDOR AND METER TYPE IT WILL USE IN THIS PROJECT?

A. DE-Ohio is currently evaluating three different scenarios, each representing a variation in the vendor of the meter and the provider of the communications system. Under evaluation are:

- Echelon meters and Verizon communications
- Echelon meters and Silver Spring Network communications
- GE meters and Silver Spring Network communications

There are different costs and benefits associated with each combination, which can vary in effectiveness based on the density of housing and type of terrain. It is also possible that DE-Ohio will choose to optimize the meter selection by choosing a small mix of vendors for its meters based on the results of a circuit-by-circuit analysis of the DE-Ohio system.

Q. WILL CUSTOMERS SEE A CHANGE IN THEIR SERVICE UPON INSTALLATION OF THESE METERS?

A. Yes. The most immediate change will be the elimination of having to obtain a manual meter reading. Having remote access to the usage data will reduce the need for customer appointments, result in more accurate billing and the ability for our customer service representatives to have better data to respond to customer billing inquiries. Over a period of time we would begin to offer the other enhanced customer service benefits mentioned herein such as improved outage communication and remote connect and disconnect.

VII. COLLECTION DEVICES

Q. WHAT IS A COLLECTION DEVICE?

A. A collection device is like a computer and is responsible for the actual collection of data from each meter and the relaying of that data to DE-Ohio. At each collection box, there is a data collector, a modem and a processor. The processor manages the modem, so that it can be used for multiple devices. For instance, a single modem can be used to relay meter data, data from sensors on the system, as well as information from the customer's premise.

Q. WHERE WILL THE COLLECTION DEVICE BE LOCATED?

A. DE-Ohio will need to install approximately one (1) collection box for every four (4) to six (6) homes, depending on housing density. They will be located at the transformer. DE-Ohio is in discussions with its vendors about the possibility of creating a meter/collector as one device. This would eliminate the need for

collection equipment at the transformer in some circumstances, and would allow DE-Ohio to design a more robust, cost-effective network.

Q. PLEASE DESCRIBE THE FUNCTIONALITY OF THE COLLECTION BOX.

A. The collection box houses the meter data collector, a modem and a processor, along with the required power sources. The meter data collector communicates with each meter, collecting and sending information to the meter. The modem is the device connecting the collector to the DE-Ohio back office system. The processor is used to manage the modem, allowing the modem to be used for more than one purpose. For example, the electric meter data, information from the transformer, information from other utility meters (gas and water), as well as communications with customer-owned equipment (e.g. air conditioners) beyond the meter, can all be managed back to DE-Ohio's home office using the same modem. The processor also has a number of open slots, like a USB port on a computer, which can be connected to various communication methodologies to reach beyond the meter, all managed from within the collector box.

Q. IS DE-OHIO ALSO CONSIDERING INSTALLING EQUIPMENT AT EACH TRANSFORMER THAT WOULD COLLECT DATA FROM THE TRANSFORMER AND SEND IT TO DE-OHIO?

A. Yes. DE-Ohio is pursuing the feasibility of installing collection equipment at each transformer that would enable DE-Ohio to communicate with the transformers and would also send data from the transformer back to DE-Ohio

regarding the health of the transformer. This capability would be combined within the collector box.

VIII. COMMUNICATIONS EQUIPMENT

Q. WHAT KIND OF COMMUNICATIONS EQUIPMENT IS REQUIRED FOR THE RELAY OF INFORMATION BETWEEN THE METER AND DE-OHIO?

A. DE-Ohio plans to utilize existing wireless communications systems for the communication of load data to DE-Ohio.

Q. WHY IS DE-OHIO WORKING WITH AN EXISTING WIRELESS PROVIDER INSTEAD OF INSTALLING ITS OWN SYSTEM?

A. The main benefit of working with an existing wireless telecommunications company is tapping into that company's expertise in the area and their existing infrastructure. The wireless company will do the research and development of the communications network and perform necessary upgrades. As a result, DE-Ohio will always have access to the latest technology.

In addition, telecommunications is not our traditional business. However, it is possible that we may still have to meet this challenge when faced with deploying intelligent meters in areas without available wireless service. DE-Ohio will need to determine whether traditional "wireline" service or broadband over the power lines would be feasible options to meet the needs of customers without available wireless service.

Q. WOULD THERE BE A DIFFERENT TYPE OF COMMUNICATIONS NETWORK BETWEEN THE METER AND THE COLLECTION DEVICE?

A. Yes. Each meter has a proprietary communications system from the meter to the collection device. However, from the collection device to DE-Ohio, DE-Ohio can use any wireless service provider available.

XI. INFORMATION TECHNOLOGY

Q. WILL DE-OHIO NEED TO UPDATE ITS COMPUTER SOFTWARE TO HANDLE THE NEW DATA FLOWING FROM THE INTELLIGENT METERS?

A. Yes. DE-Ohio is still assessing its needs in this area, but it is clear that DE-Ohio will be receiving more data than ever before and must be able to efficiently process and utilize it. DE-Ohio will need updated computer applications that will, at a minimum, coordinate meter reading, outage management, customer interface, power delivery, generation, and billing.

Q. ARE THERE OTHER NEW SOFTWARE CAPABILITIES THAT DE-OHIO WILL NEED TO INSTALL?

A. DE-Ohio will also need meter management software that will be able to monitor the health of the new meters and new software for distribution automation.

X. DEPLOYMENT SCHEDULE

Q. PLEASE DESCRIBE THE CONTEMPLATED STEPS IN THE DEPLOYMENT OF THE INTELLIGENT METERS.

A. There will likely be two (2) steps in the meter deployment as proposed by DE-Ohio. The first step would be an assessment of the system and its assets to specify general deployment areas. We will start mostly in the center city and work our way out. This would include a circuit-by-circuit assessment aimed at determining the most appropriate meter/communications combination for each household and business location in the deployment area. Also occurring in this step would be DE-Ohio entering into contracts with vendors, and hiring contractors for the meter and equipment installations.

The second step would begin upon completion of the first step. DE-Ohio would begin to deploy the new meters to each customer by utilizing the routes already used for meter reading and billing purposes. DE-Ohio intends to deploy approximately 80% of the meters and equipment within the first three (3) years of the initiative (2009-2011). The meter installers will likely follow the meter readers on their routes and switch out the meters along each route within a certain window (approximately two (2) weeks). The installers would also be responsible for obtaining the final reads from the old meters at the time of switch out. Customers would not see a disruption of service other than a short outage during the meter switch.

The collection box deployment would roughly track meter deployment. Customers with overhead service would experience no disruptions in service from

the collection box installation. We are currently evaluating installations on underground transformers and whether that might require a service interruption for installation. DE-Ohio will require more highly-trained workers for the collector box installation than will be needed for the meter installation.

XI. ONGOING METERING PILOTS IN OTHER STATES

Q. ARE ANY OF DE-OHIO'S AFFILIATED UTILTIY OPERATING COMPANIES DEPLOYING ADVANCED METERING INFRASTRUCTURE PILOT PROGRAMS IN THEIR STATES?

A. Yes. Duke Energy is currently installing meters in both North Carolina and South Carolina. 5,000 meters were installed in North Carolina as of July 2008 and another 2,500 have been installed in South Carolina. Duke Energy is also proposing a deployment in Indiana.

Q. DO YOU THINK THAT THE PILOT PROGRAMS WILL GIVE DE-OHIO NEEDED EXPERIENCE WITH INTELLIGENT METERS?

A. Yes. DE-Ohio believes that its affiliates' experience with their smart metering pilots will be highly educational and will result in the sharing of knowledge between the companies. For example, we have learned about installation techniques and the challenges of using the power line as a communication tool. Based on what we have learned, we have taken the appropriate steps to prepare the equipment prior to placing it in the field. We have also performed analysis on modems that revealed a shortcoming in our initial selection, allowing us to move to a modem with different capabilities. Obtaining such knowledge and experience

from our pilot programs will help make DE-Ohio's deployment more robust and successful.

XII. DEMONSTRATION LABS

Q. PLEASE DESCRIBE THE DEMONSTRATION LABS INSTALLED IN OHIO AND THE CAROLINAS.

A. The demonstration labs are designed to provide a "hands on" experience with the types of SmartGrid equipment that will eventually be deployed on our system. The labs provide a controlled setting where we can demonstrate the functionality and interaction of devices on the system without having to energize the devices. Additionally, the labs provide a setting to tie all of the devices together and begin to optimize the interaction prior to using the equipment at a customer site. The labs allow Duke Energy to continually evaluate products and services in a controlled environment prior to purchasing and installing. The set up of the Ohio lab will mimic DE-Ohio's system and interface with customers, including a replica of a home and commercial business, complete with interface for an electric car. Finally, the labs will also have a working replica of a Duke Energy work center to help tie all of the pieces of SmartGrid together.

Q. HOW AND WHEN DOES DE-OHIO PLAN TO DEPLOY THE AMI SYSTEM?

A. DE-Ohio has already begun pre-deployment of the system. The majority of the deployment will occur over approximately a three-year time span. We will begin installing AMI equipment in phases so that we can continue to perform the economic analysis, business requirement definition and planning, monitoring of the

maturity of AMI technologies and defining and understanding customer needs and behaviors.

For the first phase, we plan to focus on areas in Cincinnati that will provide a good mix of gas, electric, and combination accounts, as well as inside and outside meter locations. This first phase is to demonstrate the strategic and tactical value of AMI to the customer, utility, and Commission. We plan to install advanced metering capabilities for a minimum of 50,000 electric meters and 40,000 gas meters during 2008.

XIII. COST BENEFIT ANALYSIS

Q. HAS DE-OHIO ANALYZED THE COST-EFFECTIVENESS OF THE SMARTGRID PROJECT?

A. Yes. The SmartGrid project is cost effective when considering the benefits that flow to our customers, DE-Ohio and society in general. Societal benefits cannot be attributed to a specific customer or customer class but accrue to society, like reduced emissions from lower line losses. Additionally, SmartGrid provides a platform which will provide a basis for enhanced services to customers as technologies emerge. Some of us can recall when computers were first introduced for personal use. Most people at that time did not understand the ways in which computers would become a part of one's daily life. Now it is difficult to imagine life without computers. SmartGrid is similar to this in that the initial applications are fundamental and basic but, with time, it will provide the foundation for many more applications which will provide value to customers. DE-Ohio's witness, Christopher D. Kiergan will discuss the cost/benefit analysis that he has

performed on behalf of DE-Ohio to assist the Commission and other interested parties in understanding the value of the project. DE-Ohio witness Richard Stevie will discuss another value derived from deployment of SmartGrid.

Q. ARE THERE OTHER WAYS OF MEASURING SOCIETAL BENEFITS OF SMARTGRID?

A. Yes, the Ohio electric distribution utilities commissioned a study by the Electric Power Research Institute (EPRI) to consider ways to measure societal benefits from SmartGrid deployment and related technologies. EPRI presented this study to Commission Staff on July 9, 2008. The EPRI study is available on the website at the following address:

http://my.epri.com/portal/server.pt?Product_id=000000000001017006

XIV. RIDER DR-IM

Q. PLEASE DESCRIBE RIDER DR-IM.

A. Rider DR-IM is a tracking mechanism that would allow DE-Ohio to recover the costs, and then pass through to customers the savings related to the SmartGrid project. DE-Ohio would make an annual filing seeking approval to recover the revenue requirement related to its distribution infrastructure modernization and maintenance costs which includes the SmartGrid project. DE-Ohio Witness William Don Wathen, Jr. will discuss the implementation of Rider DR-IM.

XV. CONCLUSION

Q. DOES THIS CONCLUDE YOUR PREPARED DIRECT TESTIMONY?

A. Yes, it does.