

**BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO**

In the Matter of the Application of Duke Energy Ohio, Inc., for an Increase in Electric Distribution Rates.)))	Case No. 17-0032-EL-AIR
In the Matter of the application of Duke Energy Ohio, Inc., for Tariff Approval.))	Case No. 17-0033-EL-ATA
In the Matter of the Application of Duke Energy Ohio, Inc. for Approval to Change Accounting Methods.))	Case No. 17-0034-EL-AAM
In the Matter of the Application of Duke Energy Ohio, Inc. for Approval to Modify Rider PSR.)))	Case No. 17-0872-EL-RDR
In the Matter of the Application of Duke Energy Ohio, Inc. for Approval to Amend Rider PSR.)))	Case No. 17-0873-EL-ATA
In the Matter of the Application of Duke Energy Ohio, Inc. for Approval to Change Accounting Methods.)))	Case No. 17-0874-EL-AAM
In the Matter of the Application of Duke Energy Ohio, Inc. for Authority to Establish a Standard Service Offer Pursuant to Section 4928.143, Revised Code, in the Form of an Electric Security Plan, Accounting Modifications and Tariffs for Generation Service.)))))))))	Case No. 17-1263-EL-SSO
In the Matter of the Application of Duke Energy Ohio, Inc. for Authority to Amend Its Certified Supplier Tariff, P.U.C.O. No. 20.))))	Case No. 17-1264-EL-ATA
In the Matter of the Application of Duke Energy Ohio, Inc. for Authority to Defer Vegetation Management Costs.)))	Case No. 17-1265-EL-AAM

In the Matter of the Application of Duke)
Energy Ohio, Inc. to Establish Minimum)
Reliability Performance Standards)
Pursuant to Chapter 4901:1-10, Ohio)
Administrative Code.)

Case No. 16-1602-EL-ESS

**DIRECT TESTIMONY
OF
BARBARA R. ALEXANDER**

IN OPPOSITION TO THE JOINT STIPULATION AND RECOMMENDATION

On Behalf of
The Office of the Ohio Consumers' Counsel
65 East State Street, 7th Floor
Columbus, Ohio 43215

June 25, 2018

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1 **I. INTRODUCTION AND SUMMARY**

2

3 ***Q1. PLEASE STATE YOUR NAME, ADDRESS AND OCCUPATION.***

4 ***A1.*** My name is Barbara R. Alexander. I am the sole member of Barbara Alexander
5 Consulting LLC. My address is 83 Wedgewood Dr., Winthrop, ME 04364. I am
6 testifying on behalf of the Office of the Ohio Consumers' Counsel ("OCC").

7

8 ***Q2. WHAT IS YOUR RELEVANT BACKGROUND AND EXPERIENCE?***

9 ***A2.*** I opened my consulting practice in March 1996 after nearly ten years as the
10 Director of the Consumer Assistance Division of the Maine Public Utilities
11 Commission. While there, I testified as an expert witness on consumer protection,
12 customer service and low-income issues. My consulting practice is directed to
13 consumer protection, customer service and low-income programs and policies
14 relating to utilities regulation. In particular, I have focused on the changes in
15 policies and procedures required by state regulation in the transition to retail
16 competition, analysis of the costs and benefits of proposed Advanced Metering
17 Infrastructure ("AMI") proposals, analysis of rate design proposals for residential
18 customers, and net metering policies. I have appeared on behalf of state utility
19 consumer advocates and state and national consumer advocacy organizations in
20 over 25 states. With regard to AMI-related proceedings, I have evaluated and
21 submitted comments and/or testimony on proposals by electric utilities to deploy
22 AMI in Maryland, District of Columbia, Maine, Michigan, Washington,
23 Arkansas,

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1 and Illinois. I have also evaluated grid modernization policies and pilot programs
2 in Massachusetts.

3
4 I am a graduate of the University of Michigan (B.A. 1968) and the University of
5 Maine School of Law (J.D. 1976). My CV identifying my written publications
6 and testimony is attached as Exhibit BRA-1.

7

8 ***Q3. WHAT IS THE PURPOSE OF YOUR TESTIMONY?***

9 ***A3.*** I oppose the stipulation and recommendations filed in these cases on April 13,
10 2018 (the “Settlement”). The evidence presented in my testimony confirms that
11 the Settlement violates the PUCO’s three-prong test used for evaluating
12 settlements. I also support OCC objections 11 through 16 to the Staff Report¹ in
13 Duke’s base rate case, Case No. 17-32-EL-AIR (the “Rate Case”). In particular, I
14 will address Duke’s investment in a metering system that has failed to provide
15 benefits to customers.

16

17 ***Q4. PLEASE SUMMARIZE YOUR RECOMMENDATIONS IN THESE CASES.***

18 ***A4.*** 1. Duke filed its Rate Case as required by an approved settlement in Case
19 No. 10-2326-GE-RDR.² Under that settlement, Duke’s revenue requirement in the
20 Rate Case was required to “reflect the level of the benefits attributable to

¹ Case No. 17-32-EL-AIR, Staff Report (Sept. 26, 2017).

² Case No. 10-2326-GE-RDR (the “Mid-Deployment Review Case”), Stipulation & Recommendation at 7 (Feb. 24, 2012) (the “Mid-Deployment Review Settlement”); Opinion & Order (June 13, 2012).

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1 SmartGrid which have actually been achieved” by Duke.³ Duke’s application,
2 testimony, and responses to discovery requests fail to quantify these benefits.
3 Likewise, the Staff Report in the Rate Case does not address this issue. Thus, I
4 recommend that the revenue requirement be reduced by \$12.933 million, which is
5 the agreed-upon annual value of smart grid benefits to customers under the Mid-
6 Deployment Review Settlement.

7
8 2. The Mid-Deployment Review Settlement also provides that in the Rate
9 Case, the revenue requirement will include only “prudently incurred current costs
10 associated with the [smart grid] program.”⁴ I will describe in detail below the
11 imprudent decisions that Duke made regarding its smart grid investments.
12 Because of this imprudence, (a) the PUCO should disallow the date certain book
13 value of Duke’s residential “Echelon” metering system,⁵ which was about \$68.7
14 million, (b) the PUCO should reject the Staff Report recommendation that Duke
15 be permitted to charge customers expenses related to the Echelon metering system
16 with accelerated depreciation, and (c) Duke’s shareholders—and not its
17 customers—should undertake and bear the risk for any further investment in
18 Duke’s “smart grid” metering and data management system.

³ Mid-Deployment Review Settlement at 7.

⁴ Mid-Deployment Review Settlement at 7.

⁵ I discuss the difference between Duke’s “Echelon” metering system and “Itron” metering system below.

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1 3. The PUCO should reject the Settlement's proposal for a battery storage
2 project because it lacks sufficient detail and support for \$20 million in charges to
3 consumers.

4

5 ***Q5. WHAT IS THE PUCO'S STANDARD FOR REVIEWING SETTLEMENTS?***

6 ***A5.*** The PUCO uses these criteria for evaluating the reasonableness of a proposed
7 settlement:

8 1. Is the proposed settlement a product of serious bargaining
9 among capable, knowledgeable parties?

10 2. Does the proposed settlement, as a package, benefit
11 customers and the public interest?

12 3. Does the proposed settlement violate any important
13 regulatory principle or practice?

14

15 In addition to these three criteria, the PUCO also routinely considers whether the
16 parties to the settlement represent diverse interest.

17

18 Throughout my testimony I will document why the proposed Settlement, as a
19 package, violates the second and third prongs because its provisions will harm
20 customers, fails to benefit the public interest, and violates important regulatory
21 principles and practices.

1 ***Q6. HOW WILL YOU REFER TO DUKE’S METERING INVESTMENTS IN***
2 ***YOUR TESTIMONY?***

3 ***A6.*** I will refer to Duke’s original and most predominant metering system as the
4 “Echelon metering system.” It serves the vast majority of Duke’s residential
5 customers and consists of Echelon meters, a meter data management system
6 (“EDMS”), and a communication system based on nodes and cellular modems, as
7 well as the system that Duke uses to translate this data into its billing system. I
8 will use the term “smart grid” or “AMI” in quotation marks when referring to the
9 Echelon metering system.

10

11 **II. DUKE’S “SMART GRID” INVESTMENTS PROMISED**
12 **FUNCTIONALITIES AND BENEFITS THAT IT HAS NOT DELIVERED,**
13 **THEREBY HARMING CUSTOMERS WHO ARE ASKED TO PAY FOR**
14 **THIS INVESTMENT.**

15

16 ***Q7. PLEASE SUMMARIZE THE BACKGROUND ASSOCIATED WITH DUKE’S***
17 ***“SMART GRID” INVESTMENTS.***

18 ***A7.*** The PUCO approved Duke’s deployment of an advanced metering system (called
19 “SmartGrid”) in 2008.⁶ The PUCO initiated a review of the AMI deployment and

⁶ *In re Application of Duke Energy Ohio, Inc. for Approval of an Elec. Sec. Plan*, Case No. 08-920-EL-SSO, Opinion & Order (Dec. 17, 2008).

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1 associated functionalities in 2010 that resulted in the Mid-Deployment Review
2 Settlement, which the PUCO approved in 2012.

3
4 ***Q8. DID DUKE COMPLY WITH THE REQUIREMENTS OF THE***
5 ***COMMISSION-APPROVED MID-DEPLOYMENT REVIEW***
6 ***SETTLEMENT?***

7 ***A8.*** No. In the Mid-Deployment Review Case, the PUCO required Duke to file a base
8 rate case in the first year after full deployment of its smart grid system.⁷ The
9 Order approving the Mid-Deployment Review Settlement requires the test year
10 revenue requirement in the Rate Case to “reflect the level of the benefits
11 attributable to SmartGrid, which have actually been achieved by Duke.”⁸

12
13 Duke filed its required base rate case in Case No. 17-032-EL-AIR (one of the
14 proceedings that this Settlement purports to resolve) but failed to comply with the
15 PUCO order. It did not identify the benefits actually achieved by its SmartGrid
16 investment in its application or testimony. And when OCC attempted to obtain
17 this information through discovery, Duke admitted that it does not track the data
18 requested.⁹ As a result, Duke has failed to comply with the Commission-
19 approved settlement in Case No. 10-2326-GE-RDR.

⁷ Mid-Deployment Review Settlement.

⁸ Case No. 10-2326-GE-RDR, Opinion & Order at 15 (June 13, 2012).

⁹ See Case No. 17-32-EL-AIR, Duke’s response to OCC INT-05-112 through 121 (attached as Exhibit BRA-3). Although some of these are marked confidential, counsel for Duke confirmed that they need not be treated as confidential any longer. A copy of Duke’s counsel’s email is included in Exhibit BRA-3.

1 ***Q9. WHAT DO YOU RECOMMEND AS A REMEDY FOR DUKE'S VIOLATION***
2 ***OF THE MID-DEPLOYMENT REVIEW SETTLEMENT?***

3 ***A9.*** Under the Mid-Deployment Review Settlement, it was agreed that customers
4 received \$12.933 million in savings per year under Duke's infrastructure
5 modernization rider (Rider DR-IM).¹⁰ Because Duke did not quantify the actual
6 benefits that should now be included in base rates, I recommend that the PUCO
7 reduce Duke's base rate revenue requirement by \$12.933 million.

8

9 ***Q10. DID THE STAFF REPORT ADDRESS THE PRUDENCE OF DUKE'S***
10 ***SMART GRID INVESTMENTS?***

11 ***A10.*** No. Under the Order approving the Mid-Deployment Review Settlement, the Rate
12 Case revenue requirement can include only "prudently incurred current costs
13 associated with the [SmartGrid] program."¹¹ The Staff Report filed in response to
14 Duke's pending rate case proposal says nothing about the prudence of Duke's
15 smart grid investments. As I explain below, the evidence strongly shows that
16 Duke's smart grid investments to date have not been prudent.

¹⁰ Mid-Deployment Review Settlement at 7.

¹¹ Case No. 10-2326-GE-RDR, Opinion & Order at 15 (June 13, 2012).

Q11. PLEASE SUMMARIZE DUKE ENERGY'S "SMART GRID" METERING INVESTMENTS AND THEIR FUNCTIONALITIES AS REFLECTED IN PRIOR PROCEEDINGS.

A11. Duke has installed two types of AMI metering systems, and they operate independently in terms of certain basic functionalities. The Echelon metering system does not produce billing quality interval usage data, does not connect to in-home devices or displays, cannot be upgraded remotely to correct its deficiencies, and does not have typical outage-related communication capabilities. The Itron metering system appears to have all these typical "smart grid" or "AMI" functionalities and operates with a separate wireless communication system that is typical of AMI systems installed in other states.

The presence of two separate AMI metering, meter data management systems, and communication systems is highly unusual. I have not seen other utilities implement such an approach. Nor is there any evidence that Duke submitted any proposal to the PUCO to install the Itron metering system or sought PUCO approval to operate two metering systems.¹² Duke did not originally propose two metering systems, and Duke's 2009 Ohio Smart Grid Design Basis Document described only the Echelon metering system.¹³

¹² Mr. Schneider stated that he was unaware of any specific approval sought from PUCO for the installation of the Itron metering system starting in 2013. *See* Deposition of Donald L. Schneider, Jr. at 36 (transcript filed January 17, 2018) (the "Schneider Deposition").

¹³ *In re Application of Duke Energy Ohio to Adjust & Set its Gas & Elec. Recovery Rate for SmartGrid Deployment under Riders AU & DR-IM*, Case No. 09-543-GE-UNC. Confidential Release, Attachment DHD-1, (July 12, 2011).

**Q12. WHAT DID DUKE PROMISE ABOUT THE ATTRIBUTES AND
FUNCTIONALITIES OF ITS PROPOSED “AMP” SYSTEM WHEN IT
APPLIED TO RECEIVE TAXPAYER FUNDS FROM THE U.S.
DEPARTMENT OF ENERGY IN 2009?**

A12. Duke Business Services LLC applied for a Smart Grid Investment Grant to the U.S. Department of Energy (“DOE”) on August 5, 2009, seeking \$200 million in federal funds for smart grid deployment in Indiana, Ohio, and Kentucky.¹⁴ This grant application described the smart grid system it would install with DOE funds as being able to provide functionalities and features that the Echelon metering system does not and has never delivered, such as “dynamic pricing,” the ability for “remote configuration and firmware upgrade capability”¹⁵ and the ability to generate billing-quality interval data.¹⁶ Duke’s DOE application described a single Echelon metering system and did not mention the installation of a second Itron metering system.

¹⁴ U.S. DOE, Duke Energy Business Services LLC (Smart Grid Deployment) (September 2013), available at <https://www.smartgrid.gov/files/Duke-Energy-Business-Services-Smart-Grid-Deployment.pdf> (last visited June 13, 2018); U.S. Department of Energy, “Integrated Smart Grid Provides Wide Range of Benefits in Ohio and the Carolinas,” (Sept. 2014), at 6, available at: <https://www.smartgrid.gov/files/C7-Duke-Energy-Case-Study-FINAL-092914.pdf> (last visited June 13, 2018). *See also* Exhibit BRA-4 (Duke’s smart grid investment grant application).

¹⁵ Exhibit BRA-4 at 22 of 40.

¹⁶ *Id.* at 25 of 40.

1 ***Q13. WHEN DUKE SUBMITTED ITS COST BENEFIT ANALYSIS OF ITS***
2 ***“AMI” SYSTEM IN 2009, DID DUKE PROJECT THE NEED TO REPLACE***
3 ***ITS METERING SYSTEM LESS THAN THREE YEARS AFTER FULL***
4 ***DEPLOYMENT?***

5 ***A13.*** No. In July 2009, Duke Energy submitted the testimony of Christopher D.
6 Kiergan in Case No. 07-589-GA-AIR.¹⁷ According to the assumptions included
7 in Duke’s NPV analysis dated 7/24/2008, the useful life of the Echelon meters is
8 20 years, Badger gas modules is 15 years, and Ambient integrated
9 communications box and Echelon/Verizon data collectors and Verizon modems
10 on the distribution system is ten years. The “failure rate” built into the model is
11 0.3% for the Echelon residential meters and Badger Gas Modules, and 2% for the
12 Ambient/Badger communication box and data collectors. As a result, the model
13 did not include any large-scale replacement of the Echelon meters beyond the
14 modest failures rates included in this model.

15
16 As documented by Duke witness Schneider’s testimony in these Rate Case and
17 ESP proceedings, Duke now seeks to replace the entire Echelon metering system
18 long before the end of its predicted useful life. While Mr. Schneider’s testimony
19 in these proceedings focuses on the failures associated with the node
20 communication system that serves the Echelon metering system, his proposal

¹⁷ Case No. 07-589-GA-AIR, Direct Testimony of Christopher D. Kiergan on Behalf of Duke Energy Ohio (July 28, 2008).

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1 actually calls for the replacement of all Echelon meters (and associated meter data
2 management system) as well as all of the corresponding communication nodes.

3

4 ***Q14. WHAT OTHER EVIDENCE EXISTS THAT AT THE TIME THAT DUKE***
5 ***SOUGHT APPROVAL OF THE SMART GRID COSTS, IT PROMISED***
6 ***FUNCTIONALITIES FOR THE ECHELON METERING SYSTEM THAT IT***
7 ***NOW ACKNOWLEDGES THAT IT DOES NOT DELIVER?***

8 ***A14.*** In July 2008, Duke witness Todd Arnold testified that the Echelon metering
9 system would provide customers with “real time data” to see their usage daily,
10 more accurate bills, elimination of field visits to initiate or transfer service, ability
11 to notify via text message about an outage event, forecasting monthly usage, the
12 elimination of having customers call to report an outage, give customers the
13 option to receive communications through text messages, cell phone, email,
14 outbound automated calls, “in home digital display devices,” prepaid metering
15 and other flexible billing options to its customers.¹⁸

16

17 ***Q15. DID THE 2011 META VU AUDIT REPORT SUBMITTED IN THE MID-***
18 ***DEPLOYMENT REVIEW CASE RECOGNIZE THAT THE ECHELON***
19 ***SYSTEM DID NOT PROVIDE BILLING QUALITY INTERVAL USAGE***
20 ***DATA AND OTHER CRITICAL AMI FUNCTIONALITY?***

21 ***A15.*** Yes. In 2011, MetaVu, Inc. prepared a “Duke Energy Ohio Smart Grid Audit and

¹⁸ *In re Application of Duke Energy Ohio, Inc. for an Increase in Gas Rates*, Case No. 07-589-GA-AIR, Direct Testimony of Todd W. Arnold at 3-8 (July 28, 2008).

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1 Assessment” in Case No. 10-2326-GE-RDR (the “MetaVu Report” or “MetaVu
2 Audit”). The MetaVu Report documented that Duke had installed two different
3 meter data management systems, the “EDMS” connected to the Customer
4 Management System (“CMS”) and the “MDM” connected to the Enterprise
5 Customer System (“ECS”), but did not discuss or identify whether different AMI
6 meters were installed at that time. Rather, the report confirmed the two different
7 functionalities of these separate meter data management systems.

8

9 The report did document that the “EDMS” could not be used to bill for rates that
10 require billing quality hourly usage interval usage data, but that the “MDM” had
11 this capability. Specifically, the report provides that interval and “daily scalar”
12 data were gathered by EDMS; however, Echelon’s CMS, which creates
13 customers’ bills, is not used “for customers choosing to be billed on time
14 differentiated rates.”¹⁹ Instead, the report found that “[t]he VEE routines in the
15 EDMS system,²⁰ which serves as the data source for bills calculated by CMS,
16 focus on single daily customer energy usage reads,”²¹ and not interval data. On
17 the other hand, the MDM includes routines to ensure that the interval usage data
18 is of billing quality.²²

¹⁹ MetaVu Audit at 38.

²⁰ VEE routines indicate the ability to provide billing quality interval usage data.

²¹ MetaVu Audit at 38.

²² *Id.* at 39.

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1 These statements confirm that the Echelon meters and the associated EDMS were
2 not used to bill for rates and charges to consumers that require billing quality
3 hourly interval usage data, critical for the ability to offer any time-differentiated
4 rate or demand response programs that rely on hourly usage information. In
5 addition, the MetaVu report stated that Duke conformed to less than half of the
6 standard protocols reflected for certain National Institute of Standards and
7 Technology (“NIST”) guidelines for Smart Grid protocols and policies, including
8 several guidelines relating to security features.²³

9

10 ***Q16. WHAT WAS THE STATUS OF DUKE’S AMI DEPLOYMENT AT THE***
11 ***TIME OF THE MID-DEPLOYMENT REVIEW CASE?***

12 ***A16.*** In its Opinion and Order issued in the Mid-Deployment Review Case in 2012,²⁴
13 the PUCO noted that since deployment began in 2008 through 1st Quarter 2011,
14 179,744 electric meters, 132,554 gas meters, and 32,236 communications nodes
15 had been installed, but that only 151,647 electric and 110,593 gas meters had been
16 “certified” as used for billing purposes. As a result, Duke’s “AMI” deployment
17 was about 25% complete at the time of the MetaVu Report (June 2011).

²³ MetaVu Audit at 12. The confidential version of this audit describes these results in more detail. NIST is a measurements standards laboratory within the U.S. Department of Commerce that has proposed uniform communication and cybersecurity standards for smart grid deployment. *See* <https://www.nist.gov/>.

²⁴ Case No. 10-2326-GE-RDR, Opinion & Order (June 13, 2012).

1 ***Q17. WHAT COMMITMENTS DID DUKE MAKE IN THE SETTLEMENT THAT***
2 ***THE PUCO APPROVED IN THE MID-DEPLOYMENT REVIEW CASE***
3 ***ORDER ISSUED IN JUNE 2012?***

4 ***A17.*** Even though Duke was unable to implement a time of use pilot program using the
5 EDMS (installed with the Echelon meters), Duke continued to install the Echelon
6 metering system and its associated EDMS. As part of the settlement, Duke
7 committed to work with the Smart Grid Collaborative to develop a “portfolio” of
8 non-pilot time-varying rates. The Mid-Deployment Review Settlement further
9 provided that “Duke will provide CRES providers the necessary billing system
10 functionality to offer Marketer customers TD rates consistent with its existing
11 supplier tariff beginning January 1, 2013.”²⁵

12
13 Based on the Meta Vu audit report and its findings, as well as Duke’s own
14 experience (implementing a time of use pilot program that had to connect Echelon
15 meters to a different meter data management system), Duke knew or should have
16 known that these commitments to offer time of use or other dynamic pricing
17 programs could not reasonably be implemented. The vast majority of its
18 customers served by the Echelon metering system and its associated EDMS could
19 not be provided with billing quality interval usage data that is crucial to offering
20 time-differentiated rate programs or demand response programs that rely on
21 hourly usage data, such as peak time rebates. For customers that means that one of

²⁵ *Id.*

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1 the key initial promises associated with Duke's "smart" metering system (and
2 reflected in every other AMI deployment that I am aware of) cannot be delivered.
3 Duke cannot directly offer to its customers and cannot offer marketers the option
4 of offering any time-differentiated rate options or demand response program that
5 relies on hourly usage data, eliminating a potential benefit associated with AMI
6 generally and Duke's promised functionalities for this system at the time it was
7 installed.

8

9 Nevertheless, Duke continued installing the Echelon system with federal taxpayer
10 and utility customer funding. Duke's actions to pursue deployment of a metering
11 system that did not conform to its own promised AMI functionalities was
12 imprudent and has caused customers to be harmed because customers have paid
13 for this system through the rider but have not received the promised benefits
14 relied upon to justify recovering this investment from customers.

15

16 ***Q18. HAS THE PUCO APPROVED DUKE'S INSTALLATION OF TWO***
17 ***SEPARATE SMART METERING SYSTEMS?***

18 ***A18.*** No. The PUCO has not ruled on Duke's prudence in installing these two metering
19 systems or on any proposal by Duke to replace the Echelon metering system. The
20 first record of Duke publicly addressing the two systems with the PUCO is in
21 Case No. 13-1141, in which Duke requested an adjustment to Rider AU and Rider
22 DR-IM. Duke witness Donald Schneider filed testimony in 2014 where he
23 described the two systems when addressing data concerns with the Smart Grid

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1 Program.²⁶ This case involved collection of 2012 costs and was not a review of
2 the prudence of the dual AMI deployment that Duke had implemented.²⁷

3

4 ***Q19. DID DUKE WITNESS SCHNEIDER'S 2014 TESTIMONY DESCRIBE***
5 ***DUKE'S TWO "AMI" METERING SYSTEMS?***

6 ***A19.*** Yes. Mr. Schneider's 2014 testimony admitted that Duke installed two different
7 AMI metering systems, one of which (the Echelon metering system) could not
8 provide hourly interval data (which is required for time-differentiated and similar
9 rate options), among other things, and one of which (the Itron metering system)
10 could.²⁸

11

12 ***Q20. DID YOU OBTAIN ADDITIONAL INFORMATION ABOUT THE SCOPE***
13 ***AND SCALE OF THE TWO METERING SYSTEMS AND THEIR***
14 ***FUNCTIONALITIES IN THE CEUD CASE?***

15 ***A20.*** Yes. In Case No. 14-2209-EL-ATA (the "CEUD Case"), I explored the history of
16 the two metering system deployments and their different functionalities. The
17 testimony and discovery in the CEUD case confirmed the existence of two

²⁶ Case No. 13-1141-GE-RDR, Supplemental Direct Testimony of Donald Schneider on Behalf of Duke Energy Ohio, Inc. (Jan. 29, 2014) (the "Schneider 2014 Testimony").

²⁷ Case No. 13-1141-GE-RDR, Opinion & Order at 16-17 (Apr. 9, 2014).

²⁸ Schneider 2014 testimony at 4-6.

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1 metering systems and documented the different functionalities of the two systems
2 in more detail.²⁹

3
4 Among other things, the Echelon meter can produce 15-minute and hourly
5 interval usage data, but the EDMS is not capable of providing billing quality
6 customer energy usage data, and the interval data captured by the Echelon meters
7 is not relied upon by Duke for billing any customer. Therefore, the vast majority
8 of residential customers with Echelon meters cannot be offered any time-
9 differentiated rate option or demand response program that relies on interval
10 usage data to bill customers. These meters are also not equipped with home area
11 network radios or equivalent technology that would allow customers to obtain
12 access to real time energy use data or connect smart devices with digital
13 communication functionality to Duke's metering system.

14
15 Further, all of the functionalities that Duke claims are lacking with the Echelon
16 metering system are present and available with Itron metering and what Mr.
17 Schneider incorrectly describes as a "second generation" meter data management
18 system (MDMS). Unlike the Echelon meters, the Itron meters have the radio
19 feature which, if activated, would allow a customer to connect via an in-home
20 network and can provide the "last gasp" meter reading for outage events. The fact

²⁹ Case No. 14-2209-EL-ATA, Duke's Response to DE-INT-01-019 (attached as Exhibit BRA 5), Duke's Response to DE-INT-01-020 (attached as Exhibit BRA 6), Duke's Response to OCC-INT-04-074 (attached as Exhibit BRA 7).

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1 that Duke has installed a proper AMI system for a small percentage of its
2 customers confirms that Duke has known since it began installing the Itron
3 metering system (as well as when it had to rely on a different meter data
4 management system to implement its dynamic pricing pilot in 2010-2011) that its
5 Echelon metering system fails to deliver the basic AMI functionalities that Duke
6 promised to the PUCO and DOE.

7

8 In the CEUD proceeding, Duke stated that it could not correct the lack of
9 functionalities with respect to the Echelon system's inability to produce billing
10 quality customer energy usage data without significant cost. But the costs and the
11 technical review to upgrade the system to provide billing quality customer energy
12 usage data were never fully quantified in that proceeding.

13

14 I note that throughout this attempt to document the different functionalities of the
15 Echelon and Itron metering systems, Duke never acknowledged that it had any
16 responsibility for the failures of the Echelon metering system and has consistently
17 proposed that customers "fix" this problem with additional charges. Duke's
18 position has been and continues to reflect its view that Duke should replace the
19 Echelon metering system, including its failed communication system and its
20 Echelon meters, thus allowing Duke's shareholders to earn much more because it
21 could charge customers for two metering systems and earn a return on capital
22 investments. Allowing Duke to charge customers for replacing the Echelon
23 metering system that serves the vast majority of residential customers would be

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1 against the public interest and violate the regulatory principle to ensure that rates
2 are just and reasonable, as well as the obligation to ensure that costs incurred by
3 public utilities are prudent.

4

5 ***Q21. DID DUKE INTENTIONALLY LIMIT THE ABILITY OF ITS ECHELON***
6 ***METERING SYSTEM TO PRODUCE BILLING QUALITY INTERVAL***
7 ***USAGE DATA?***

8 ***A21.*** Yes. Duke witness Schneider stated that the Echelon metering system could
9 produce billing quality customer energy usage data but that Duke simply decided
10 not to use that capability.³⁰ Yet it was Duke, and Duke alone, who developed the
11 system requirements for the meter data management system, prepared the
12 specifications, managed the procurement process, and ultimately oversaw the
13 deployment of the meter data management system it didn't use. And it was Duke,
14 and Duke alone, who limited the functionality of the meter data management
15 system such that customers were denied access to the dynamic pricing options
16 that they paid for and were promised both at the PUCO and through the DOE
17 grant.

³⁰ Schneider Deposition at 101, 104.

1 ***Q22. PLEASE SUMMARIZE THE FUNCTIONALITIES AND ATTRIBUTES OF***
2 ***DUKE’S “AMI” SYSTEM THAT WERE ORIGINALLY PROMISED AND***
3 ***THAT NOW DUKE ACKNOWLEDGES ARE NOT AVAILABLE WITH THE***
4 ***ECHELON METERING SYSTEM.***

5 ***A22.*** Many of the promised functionalities reflected in Duke’s Smart Grid Investment
6 Grant application, Mr. Arnold’s 2009 testimony, and the Mid-Deployment
7 Review Settlement are not provided by the Echelon metering system. Essentially,
8 Duke sold customers, the PUCO, and the federal government on a metering
9 system that does not perform the very tasks Duke touted as the rationale for
10 purchasing and implementing it. Even when it became clear to Duke in 2011 that
11 its Echelon metering system could not implement time-of-use pricing programs
12 and when Duke began a wider installation of the Itron metering system in 2012,
13 the Utility never informed the PUCO or stakeholders that the Echelon metering
14 system could not deliver the benefits that Mr. Arnold promised to the PUCO in
15 2008 and that Duke promised to deliver with its SGIG application to the U.S.
16 Department of Energy.

17
18 Requiring customers to pay more now for a replacement system for the Echelon
19 metering system would reward Duke for its imprudent actions in continuing to
20 install the Echelon metering system. To approve this Settlement, which would
21 allow Duke to recover the costs of the Echelon metering system and even
22 accelerate the depreciation costs for this system as reflected in the Staff Report,
23 would only reward Duke’s shareholders for its imprudent actions. This

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1 Settlement's provisions to allow recovery of costs for the Echelon metering
2 system fails the test of ensuring that it would provide customer benefits and be in
3 the public interest. Customers should not be required to pay for Duke's failure to
4 provide an "AMI" system that does not perform as Duke originally promised.
5

6 ***Q23. IS THERE OTHER EVIDENCE THAT DUKE'S ECHELON METERING***
7 ***SYSTEM FAILS TO PERFORM STANDARD "AMI" FUNCTIONALITIES?***

8 ***A23.*** Yes. Duke confirmed through discovery various typical AMI functionalities that
9 its Echelon metering system cannot provide. For example, on Duke's customer
10 web portal, customers can only see their kWh usage data, but not the predicted
11 dollar amount of the customer's bill. Nor does the web portal provide any alert
12 capabilities.³¹ Duke's proposed "smart meter usage app" cannot be implemented
13 now because Echelon meters are not equipped with a ZigBee compliant home
14 area network chip.³² The Echelon meter can provide interval data but Duke does
15 not plan to integrate usage alerts with the Echelon meter data management
16 system."³³ Echelon meters do not provide a "last gasp" functionality, thus making
17 their implementation into the Outage process much more limited in
18 functionality.³⁴ Also, Duke Energy Ohio's Echelon meters do not have an outage

³¹ Case No. 17-32-EL-AIR, Duke Response to OCC-INT-09-199 (attached as Exhibit BRA 8).

³² Case No. 17-32-EL-AIR, Duke Response to OCC-INT-11-213(a) (attached as Exhibit BRA 9).

³³ Case No. 17-32-EL-AIR, Duke Response to OCC-INT-11-211 (attached as Exhibit BRA 10).

³⁴ *Id.*

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1 reporting feature.³⁵ And with regard to “pick your own due date” and “prepaid
2 advantage,” Duke will not interface these programs with the Echelon meter data
3 management system.³⁶

4

5 ***Q24. DID OTHER UTILITIES INSTALLING SMART METERING SYSTEMS***
6 ***AROUND THE SAME TIME AS DUKE EXPERIENCE THE SAME***
7 ***FAILURES REGARDING BASIC FUNCTIONALITY FOR CUSTOMERS?***

8 ***A24.*** No. Duke’s Echelon metering system was installed at the same time as other AMI
9 systems, many pursuant to the same DOE funding opportunity relied on by Duke,
10 but other AMI systems contained the functionalities that Duke promised and
11 failed to deliver. None of these other AMI systems have sought to replace the vast
12 majority of their meters and associated communication systems as Duke intends
13 to implement because those utilities installed AMI systems that conformed to
14 their promised benefits and functionalities that are similar to Duke’s Itron
15 metering system. These benefits and functionalities are conspicuously absent in
16 Duke’s Echelon metering system. Further, I am not aware of any other utility that
17 installed two completely independent smart metering systems simultaneously.

18

19 Starting in 2007, other states identified critical AMI functionalities and criteria for
20 utility AMI deployment proposals. I participated in AMI deployment proceedings

³⁵ Case No. 17-32-EL-AIR, Duke Response to OCC-INT-11-208 (b), (c), (g) and (h) (attached as Exhibit BRA 11).

³⁶ Case No. 17-32-EL-AIR, Duke Response to OCC-INT-11-209 (attached as Exhibit BRA 12); Duke Response to OCC-INT-11-210 (attached as Exhibit BRA 13).

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1 in Maine, Maryland, and the District of Columbia that were proposed at the same
2 time frame (or earlier) as Duke's system was proposed (2007-2009). None of
3 those systems reflected this "first generation" Echelon metering and meter
4 communication system installed by Duke, and all of them are comparable in
5 functionality to the "second generation" MDMS and Itron system that Duke
6 witness Schneider stated the Utility began installing in Ohio in 2012.

7

8 For example, in Maryland, the public service commission adopted statewide
9 minimum functionalities and criteria for advanced metering systems, which
10 includes many of the capabilities that Duke promised with its Echelon metering
11 system but never delivered.³⁷ In Maine, Central Maine Power Company proposed
12 an AMI deployment for its electric customers in 2007.³⁸ This AMI proposal, filed
13 a year before Duke's initial smart grid application in Ohio, reflected basic
14 functionalities that are not present with Duke's Echelon metering system. And in
15 Texas, the Texas Public Utilities Commission adopted a formal rule that was
16 effective in May 2007 defining the functionalities of an advanced metering
17 system to guide the Texas utilities in such investments. Again, these rules include
18 various functionalities that Duke's Echelon metering system initially promised to
19 deliver but later was determined cannot.³⁹ I attach a compilation of these state

³⁷ Maryland Public Service Commission, *In re Commission's Investigation Of Advanced Metering Technical Standards*, Case No. 9111, Order No. 81637 (Sept. 28, 2007).

³⁸ Maine Public Utilities Commission, *Central Maine Power Co., Request for New Alternative Rate Plan*, Docket No. 2007-215, Testimony of Mary Elizabeth Nowack Cowan (Redacted). Volume V-B, Advanced Metering Infrastructure (May 1, 2007).

³⁹ See Texas Pub. Util. Comm. Rule 25.130 (Advanced Metering).

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1 defined AMI functionalities as Exhibit BRA-2, which documents that the AMI
2 functionalities that Duke now seeks to characterize as “second generation” (and
3 associated with its Itron metering system) were in fact “first generation” attributes
4 that were part of all the initial AMI deployments that were being considered at the
5 same time that Duke sought to install AMI in Ohio.

6
7 Furthermore, while I did not participate in the AMI proceedings in California, I
8 have followed the development of the implementation of those systems and
9 associated functionalities, and all those investor-owned AMI systems generate
10 billing quality interval usage data that is used to provide time of use and peak
11 time rebate programs to their customers, as well as allowing customers to connect
12 to the meter with approved in-home devices and signal an outage event. Most of
13 the California AMI systems were also proposed and deployed prior to Duke’s
14 AMI system.

15
16 ***Q25. WHAT DO YOU CONCLUDE BASED ON OTHER STATES’ AMI***
17 ***DEPLOYMENTS AT THE SAME TIME OR BEFORE DUKE’S?***

18 ***A25.*** Simply put, other utilities proposed and deployed fully functional AMI systems
19 that can provide billing quality interval usage data and included the functionality
20 to connect to customer in-home devices at the very time Duke was preparing and
21 proposing its initial smart grid projects in Ohio. Duke’s applications to both the
22 PUCO and the DOE promised these same functionalities, but Duke deployed the
23 Echelon metering system that does not comply with its own promises, which were

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1 widely viewed as critical to any AMI system. Mr. Schneider attempts to justify
2 Duke's widespread installation of the Echelon metering system without any
3 recognition that the benefits that Duke promised to PUCO and the DOE could not
4 ever be delivered. He also claims that the Echelon system was, at the time of its
5 installation, justified by virtue of technological options available at that time (his
6 so-called "first generation" technology). Both of these assertions should be
7 rejected as improper and incorrect. Duke's assertions should not be relied upon to
8 either excuse Duke's imprudent investment or require customers to pay to replace
9 the Echelon metering system. Neither customers nor the public interest would
10 benefit from including the costs of the Echelon metering system in rates, failing to
11 include the promised operational benefits, and allowing Duke to accelerate the
12 depreciation expense for this failed metering system. Furthermore, the provisions
13 of the Stipulation that would allow Duke to recover charges from customers to
14 replace the communication system installed with the Echelon metering system
15 only exacerbates the failure to comply with the obligation to demonstrate
16 customer benefits, contribute to the public interest, and conform to reasonable
17 regulatory principle to ensure recovery of prudent costs.

18
19 ***Q26. WHAT DO YOU CONCLUDE BASED ON YOUR REVIEW OF DUKE'S***
20 ***SMART GRID INVESTMENTS AND YOUR EXPERIENCE AS AN EXPERT***
21 ***ON SMART GRID DEPLOYMENT OVER THE PAST DECADE?***

22 ***A26.*** Duke knew or should have known, at least as early as June 2011 (the date that the
23 MetaVu Audit was published)—and earlier—that its Echelon metering system

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1 was not providing the benefits of smart grid that it had promised to the PUCO and
2 U.S. Department of Energy. It was imprudent for Duke to continue installing a
3 metering system, and charging customers for that system, when the system did not
4 and could not provide even the most basic AMI functionalities. And it was
5 unreasonable and improper for Duke to continue to pursue cost recovery for a
6 metering system that was not the “smart grid” system that Duke promised would
7 be deployed and relied upon for customer benefits. Customers should not be
8 required to pay for the failed Echelon metering system. I recommend that the
9 PUCO disallow the remaining book value of Duke’s Echelon metering system,
10 which is \$68,730,098.⁴⁰ Requiring customers to pay for this book value in base
11 rates would not benefit customers or the public interest and violates important
12 regulatory principles and policies to ensure that rates are just and reasonable and
13 reflect prudently incurred utility costs.

14
15 **III. THE PUCO SHOULD REJECT DUKE’S PROPOSAL TO CHARGE**
16 **CUSTOMERS HUNDREDS OF MILLIONS OF DOLLARS MORE TO**
17 **REPLACE THE IMPRUDENTLY-INSTALLED ECHELON METERING**
18 **SYSTEM BECAUSE THE PROPOSAL HARMS CUSTOMERS AND THE**
19 **PUBLIC INTEREST.**

⁴⁰ This amount is identified on Duke’s Schedule B-2.1, under company account 3702.

1 ***Q27. PLEASE SUMMARIZE DUKE'S PROPOSAL TO REPLACE THE***
2 ***ECHELON METERING SYSTEM AS DESCRIBED BY WITNESS***
3 ***SCHNEIDER.***

4 **A27.** The Settlement's proposed Rider PF and associated costs it seeks to impose on
5 customers are directly linked to Mr. Schneider's testimony in both the Rate Case
6 and the ESP Case. There he acknowledges Duke's installation of both the Echelon
7 metering system and Itron metering system.⁴¹ But, instead of acknowledging any
8 responsibility for the different functionalities of these two "AMI" metering
9 systems, Mr. Schneider presented the need for additional charges to be imposed
10 on customers as primarily the result of the failure of the "node" communication
11 system installed with the Echelon meters.

12
13 ***Q28. WHAT DID DUKE RECOMMEND TO RESPOND TO THE DEFICIENCIES***
14 ***OF THE ECHELON METERING SYSTEM?***

15 **A28.** In his testimony in the Rate Case and the ESP Case, Mr. Schneider recommends a
16 short-term "business continuity effort" that will consist of removing 23,700
17 communication nodes from service and placing them in inventory. He also
18 proposes expanding the Itron footprint to replace 80,000 Echelon electric meters
19 and 48,800 Badger gas communication modules with Itron electric meters and
20 Itron gas communication modules. During this period, Mr. Schneider proposes
21 that Duke will begin expanding the Itron metering system in early 2017 and

⁴¹ Schneider Testimony at 3.

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1 conclude this effort by end of 2018.⁴² This “business continuity effort” is
2 estimated to cost customers \$24.2 Million.⁴³

3
4 In addition, while never explicitly reflected in his testimony, Mr. Schneider
5 admits that his proposal includes the complete replacement of the Echelon
6 metering system and its replacement with the Itron metering system under an
7 “AMI Transition Plan.”⁴⁴ This proposal would begin in 2019 and end by 2022.
8 This transition from the Echelon metering system to the Itron metering system is
9 estimated to cost customers an additional \$143.4 million, most of which will be
10 capital costs.⁴⁵

11
12 ***Q29. PLEASE DESCRIBE THE SETTLEMENT’S PROVISIONS CONCERNING***
13 ***DUKE’S “SMART GRID” METERING SYSTEM.***

14 ***A29.*** The Settlement does not explicitly reference Mr. Schneider’s proposed business
15 continuity effort or the AMI Transition Plan. However, Mr. Wathen’s testimony
16 in support of the Settlement explicitly references Mr. Schneider’s previous AMI
17 Transition testimony in the Rate Case and the ESP Case.

18

⁴² Schneider Testimony at 9.

⁴³ Case No. 17-1263-EL-SSO, Duke Response to OCC-INT-04-202 (attached as Exhibit BRA-14).

⁴⁴ Duke Response to OCC-INT-4-204 (attached as Exhibit BRA-15).

⁴⁵ Schneider Testimony at 15. As described in OCC witness Alvarez’s testimony, Duke’s cost estimates do not include carrying charges and taxes.

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1 The Settlement does include a proposed new Rider PF that has three components.
2 Component one would allow recovery of any future costs authorized by the
3 PUCO to implement its pending PowerForward initiative.

4
5 Component two allows Duke to charge customers for the expenditures described
6 in Attachment F relating to providing interval usage data to marketers and
7 implementing certain billing enhancements to allow marketers to include interval
8 billing components on the Duke bill. Attachment F includes a total cost of
9 \$12,581,250 for these projects. In addition, component two authorizes the
10 installation of the “communication infrastructure needed to support the AMI
11 transition, but excluding the cost of the smart meters themselves.”⁴⁶ The cost to
12 customers for this additional project is estimated at \$28,625,000 which, coupled
13 with the costs identified in Attachment F, totals \$41,206,250. This proposal for
14 the “communication infrastructure investments” is actually the system-wide
15 replacement of the node communication system associated with the Echelon
16 metering system.

17
18 Component three is for the recovery of “costs related to an infrastructure
19 modernization plan which will be filed in a separate proceeding and subject to
20 hearing.” The Settlement states that this component will include a proposal to

⁴⁶ Settlement at 17.

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1 upgrade Duke's Customer Information System, but there is no further information
2 on the projects or programs that might be included in these future filings.
3

4 ***Q30. IS DUKE CURRENTLY IMPLEMENTING ITS BUSINESS CONTINUITY***
5 ***PLAN AND AMI TRANSITION PLAN TO REPLACE THE ECHELON***
6 ***METERS WITHOUT ANY PUCO APPROVAL?***

7 ***A30.*** It appears that Duke is implementing its AMI Transition Plan by replacing the
8 Echelon meters with Itron meters and will seek to collect from customers the
9 capital costs for this investment in a number of ways: in Rider DCI, in a future
10 base rate case, through a future PowerForward filing, or possibly through Rider
11 PF if the Settlement is approved.⁴⁷ However, the replacement of the node
12 communication system and the data access provisions of Attachment F, both of
13 which are included in component two of the proposed Rider PF, has the impact of
14 allowing Duke to implement its AMI Transition Plan and replace the Echelon
15 metering system at customer expense (as proposed by Mr. Schneider in his Rate
16 Case and ESP Case testimony).
17

18 This attempt to avoid any prudence review should be rejected. Duke knew or
19 should have known at the time it deployed the Echelon metering system (and
20 certainly by 2011 when the MetaVu Audit was published) that the Echelon
21 metering system lacked crucial functionalities associated with smart grid systems.

⁴⁷ Duke Response to OCC-INT-03-073 (Stipulation) (attached as Exhibit BRA 16) and OCC-INT-05-110 (Stipulation) (attached as exhibit BRA 17).

1 Now Duke seeks to charge its customers to replace the system, long before the
2 end of its projected useful life and less than three years after the PUCO Staff
3 certified that the system was fully deployed.

4 **IV. THE PUCO SHOULD REJECT THE SETTLEMENT REGARDING**
5 **PROPOSED CHARGES OF \$20 MILLION TO CUSTOMERS FOR**
6 **BATTERY STORAGE PROJECTS, BECAUSE THE PROPOSAL DOES**
7 **NOT BENEFIT CUSTOMERS OR THE PUBLIC INTEREST AND**
8 **VIOLATES IMPORTANT REGULATORY PRINCIPLES AND**
9 **PRACTICES (VIOLATES SECOND AND THIRD PRONGS).**

10
11 ***Q31. PLEASE DESCRIBE THE PROVISION IN THE SETTLEMENT***
12 ***REQUIRING CUSTOMER FUNDING FOR BATTERY STORAGE***
13 ***PROJECTS.***

14 ***A31.*** The Settlement contains several provisions that purport to relate to improved
15 reliability performance. I am responding to the specific proposal on page 13 of the
16 Settlement that allows Duke to install battery storage project(s) “for the purpose
17 of deferring circuit investments or addressing distribution reliability issues.” A
18 cap on expenditures is set at \$20 million and recovery is authorized through Rider
19 DCI. In addition, there are specific provisions in this Settlement relating to
20 projects and programs to be implemented in the City of Cincinnati (one of the
21 signatories of the Settlement), which reference battery storage projects. As
22 described in the Settlement at page 5 of Attachment G, Duke “intends to install

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1 one or more batteries as part of a pilot project to determine the potential impact of
2 such batteries on Duke Energy Ohio's distribution system," and the City agrees to
3 make available its "expertise" "to assist Duke Energy Ohio in that project." This
4 assistance by the City is described as relating to "site selection, identifying areas
5 of critical City public safety infrastructure, or other issues where communication
6 would be helpful to Duke Energy Ohio."

7
8 ***Q32. HAVE YOU BEEN ABLE TO DETERMINE ANY SPECIFIC DETAILS***
9 ***ABOUT THESE PROPOSED BATTERY STORAGE PROJECTS THAT***
10 ***WOULD JUSTIFY THE APPROVAL OF THESE EXPENDITURES OR***
11 ***CONFIRM THAT THIS PROVISION WOULD BENEFIT CUSTOMERS OR***
12 ***THE PUBLIC INTEREST?***

13 ***A32.*** No. Neither the Settlement nor the discovery conducted to explore this proposal to
14 date has provided basic information that should be available to the public and the
15 PUCO prior to the approval of projects that would require \$20 million in
16 additional customer funding for reliability or any other "public safety" purpose.
17 As a result, the defects I identify below confirm that this proposal should be
18 rejected because of the lack of any evidence that it would benefit customers or
19 serve the public interest. Furthermore, if approved as proposed, there is a
20 significant risk that imprudently incurred costs would be charged to customers.

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1 First, Duke will apparently design, own, and operate the battery storage projects⁴⁸
2 even though battery storage projects have been associated with potentially
3 competitive resources in the emerging distributed generation resource market.
4 While identified as related to reliability of service, most battery storage projects
5 are closely linked to generation supply reliability (microgrid installations),
6 enhancing distributed generation profile (solar), and potentially impacted certain
7 wholesale market attributes (frequency).

8
9 Second, the number of battery storage projects is unknown.⁴⁹
10

11 Third, the battery storage projects have not been designed or located at this time⁵⁰
12 and the basis for the proposed \$20 million in costs has not been justified in
13 sufficient detail. For example, Duke has estimated that it can provide 10 MW of
14 energy storage at \$2.00/watt based on “industry knowledge” and “prior
15 experience,”⁵¹ but has not actually evaluated the costs of its proposed battery
16 storage projects for the specific reliability purpose used to justify this project.

17 Further, none of the material provided by Duke to justify these costs relate to any

⁴⁸ Duke Response to OCC-INT-03-091 (Stipulation) (attached as Exhibit BRA 18).

⁴⁹ Duke Response to OCC-INT-03-054 (Stipulation) (attached as Exhibit BRA 19).

⁵⁰ Duke Response to OCC-INT-03-055 (Stipulation) (attached as Exhibit BRA 20).

⁵¹ Duke Response to OCC-POD-05-043 (Stipulation) (attached as Exhibit BRA 21). The Attachment to this response is an industry publication that tracks the cost of battery storage projects throughout the industry based on design criteria and purpose, but it is useless to justify Duke proposal and cost estimates in this Stipulation due to the lack of design criteria and specific circuit location and costs compared to traditional reliability investments.

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1 specific projects that were implemented for this purpose, including the lack of any
2 identification of projects undertaken by Duke in other jurisdictions.⁵²

3 Fourth, Duke has not conducted any cost benefit analysis of any specific battery
4 storage project on reliability compared to more traditional investments.⁵³ Duke
5 states that it is “unknown” if any cost benefit analysis will be completed before
6 any projects a funded and “final criteria have not been determined to evaluate the
7 cost effectiveness of this proposed storage projects.”⁵⁴

8
9 Fifth, Duke has not developed or proposed specific criteria to evaluate the
10 performance and cost effectiveness of any battery storage project that might be
11 funded under this Settlement and should be used to determine the prudence and
12 value of any expenditures authorized for this purpose.⁵⁵ In discovery, Duke refers
13 to this proposal as a “pilot so it can show at scale the value that distributed battery
14 storage can provide to the grid,” and refers to values in “power quality and

⁵² For example, Duke Energy issued a press release on September 21, 2017, “Duke Energy Plans North Carolina’s largest battery storage projects as part of the Western Carolinas Modernization Plan,” (available at: <https://news.duke-energy.com/releases/duke-energy-plans-north-carolina-s-largest-battery-storage-projects-as-part-of-western-carolinas-modernization-plan>). None of Duke’s responses to discovery in this proceeding discuss the results of that project or others it has implemented or their implications for battery storage investments proposed in Ohio.

⁵³ Duke Response to OCC-INT-03-058 (Stipulation) (attached as Exhibit BRA 22) acknowledges that no cost benefit analysis for the battery storage project(s) has been performed. Duke Response to OCC-INT-03-036 and OCC-POD-03-036 includes a Confidential attachment. This attachment does not include the costs of any specific battery storage project or link such investments to any specific level of reliability improvement. Nor does it include any cost-benefit analysis per se.

⁵⁴ Duke Response to OCC-INT-03-059 (Stipulation) (attached as Exhibit BRA 23).

⁵⁵ Duke Response to OCC-INT-05-133 (Stipulation) (attached as Exhibit BRA 24). Duke’s response confirms only that “improving the reliability for customers in one metric that will be evaluated in determining the value of the storage asset,” but does not provide any specific methodology or metrics that will be relied upon for this purpose.

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1 reliability, along with bulk system benefits such as frequency regulation.”⁵⁶

2 However, none of these hypothetical attributes are reflected in the actual

3 Settlement and none of these attributes are accompanied by any specific “pilot”

4 program that identify specific criteria and metrics for evaluation of the results.

5 Sixth, the purpose of the battery storage projects linked to improved reliability of

6 service and/or avoiding circuit investments on page 13 of the Settlement conflicts

7 with the apparent purpose of any battery storage project undertaken with the

8 advice of the City of Cincinnati that would be aimed at protecting “critical City

9 public safety infrastructure.” When asked if the Attachment G reference to

10 potential battery storage projects in the City of Cincinnati would be included in

11 the battery storage projects identified for reliability purposes on page 13 of the

12 Settlement, Duke answered, “Not necessarily,” without further explanation.⁵⁷

13
14 Seventh, Duke’s attempt to link this proposal for battery storage investments to

15 the impact on reliability of distribution service as measured by outage frequency

16 and length and/or avoidance of more traditional reliability-related circuit

17 investments is not a typical purpose of battery storage projects, most of which are

18 related to generation supply reliability and often associated with microgrid

19 projects and/or distributed generation projects to impact generation supply

20 reliability and costs.

⁵⁶ Duke Response to OCC-INT-02-007 (Stipulation) (attached as Exhibit BRA 25).

⁵⁷ Duke Response to OCC-INT-05-131 (Stipulation) (attached as Exhibit BRA 26).

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1 Eighth, Duke acknowledges that a battery storage project could defer or eliminate
2 the need for circuit investment,⁵⁸ but does not justify why an additional \$20
3 million might be needed for these projects since additional funds would only be
4 needed if the battery storage projects exceeded the costs of otherwise prudent
5 circuit investments recovered through Rider DCI.

6
7 Ninth, Duke's proposal does not specify where the batteries will be located (i.e.,
8 on the local distribution grid or after the meter on the customer's premise). R.C.
9 4928 does not provide for captive monopoly customer subsidization competitive
10 services (such as storage or other generation services) at the customer's premise
11 after the meter.

12
13 ***Q33. WHAT DO YOU RECOMMEND REGARDING THE SETTLEMENT'S***
14 ***BATTERY STORAGE PROPOSALS?***

15 ***A33.*** I might have a different opinion to express on Duke's deployment of battery
16 storage if it were to use its own (shareholders) funds. But it is proposed in the
17 Settlement that Duke will deploy battery storage at its customers' expense, for
18 \$20 million. Therefore, and under the PUCO's test for considering settlements, I
19 recommend that the Settlement be rejected with its inclusion of \$20 million in
20 battery storage charges to consumers, as not being proven by Duke to be of
21 benefit to its 600,000 customers or the public interest.

⁵⁸ Duke Response to OCC-INT-03-056 (Stipulation) (attached as Exhibit BRA 27).

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1 As described above, Duke's proposals are seriously deficient. And the proposals
2 lack essential information to justify charging customers \$20 million or more for
3 battery storage projects.

4 And, under the PUCO's test for settlements, I further recommend that this
5 Settlement proposal for battery storage charges not be approved, as being
6 violative of regulatory principles and practices regarding the development of the
7 competitive markets that can benefit customers. Battery storage that will be or can
8 be behind the meter should be a competitive market, where firms provide
9 innovation and pricing benefits to consumers and where monopoly utilities should
10 not be allowed to endanger markets using their captive customers for funding.

11
12 The PUCO should reject these proposals. As I have documented with the
13 enumerated defects, the proposal to install battery storage projects on Duke's
14 distribution system to improve reliability of service fails to meet the requirements
15 of PUCO's settlement criteria. The proposal is without sufficient evidence that
16 these costs would benefit customers or the public interest. Furthermore, the
17 proposal is without sufficient criteria to ensure that costs will be prudently
18 incurred, thus violating an important regulatory practice and policy.

19
20 **V. CONCLUSION AND RECOMMENDATION**

1 ***Q34. PLEASE EXPLAIN THE RATE CASE DECISIONS THAT SHOULD BE***
2 ***ADDRESSED IN THIS PROCEEDING.***

3 ***A34.*** The Settlement as a package violates the second and third prongs for
4 PUCO approval because its provisions will harm customers, fails to
5 promote the public interest, and violates important regulatory principles
6 and practices. Specifically, Duke's shareholders, and not customers,
7 should pay any necessary costs to repair or replace the Echelon metering
8 system so that Duke's customers can receive the benefits that Duke
9 promised nearly a decade ago.

10 With regard to the Rate Case portion of this Settlement, I therefore recommend as
11 follows:

- 12 • The PUCO Staff's recommendation to allow Duke to
13 charge customers expenses associated with accelerated
14 depreciation to collect the remaining costs of the Echelon
15 metering system should be denied.
- 16 • The book value of Duke's Echelon metering system as of
17 the date certain, which was \$68,730,098, should be
18 excluded from Duke's rate base. This amount is Duke's
19 book value for its Echelon meters as identified on the
20 Schedule B-2.1, under company account 3702.
- 21 • Operations and maintenance costs incurred during the test
22 year should be reduced by \$12.933 million to reflect
23 assumed operational savings from Duke's smart grid

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1 deployment. Because Duke has not tracked or identified
2 O&M savings as required in the Mid Deployment Review
3 Settlement, I have relied upon the assumed annual savings
4 under that settlement for this amount.⁵⁹
5

6 ***Q35. PLEASE DESCRIBE YOUR RESPONSE TO THE SETTLEMENT'S***
7 ***PROPOSED RIDER PF.***

8 ***A35.*** The Settlement as a package violates the second and third prongs for PUCO
9 approval of a settlement because its provisions will harm customers, fails to
10 promote the public interest, and violates important regulatory principles and
11 practices. That is, my findings and conclusions concerning Duke's failure to
12 install a proper AMI system supports Mr. Alvarez's testimony on behalf of the
13 OCC to reject further customer funding to correct Duke's imprudent decisions.
14

15 As I have documented, Duke has installed an Echelon metering system for the
16 vast majority of its residential customers that does not conform to the
17 functionalities and promises that were made to the PUCO (and DOE) to justify
18 charging customers for this investment. Nor does this system conform to typical
19 "AMI" functionalities that were being implemented in other states at the same
20 time (or even earlier) that Duke initiated its deployment of its metering system.
21 Furthermore, Duke continued to install its Echelon metering system when it knew

⁵⁹ Case 10-2326-GE-RDR, Stipulation & Recommendation at 7 (Feb. 10, 2012).

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1 or should have known that the system did not conform to standard AMI
2 functionalities. Duke should not be rewarded in any manner for its imprudent
3 investments. There should be no additional customer funding to fix the
4 deficiencies in its current Echelon metering system. The Echelon metering system
5 was imprudently installed and improperly characterized as “smart grid” or
6 “AMI.” The Settlement’s proposal to create a new Rider PF does not benefit
7 customers and is not in the public interest. Furthermore, this provision violates an
8 important regulatory practice and policy to ensure that only prudently incurred
9 costs are included in customer rates.

10
11 ***Q36. WHAT IS YOUR RECOMMENDATION REGARDING THE PROPOSAL***
12 ***FOR A \$20 MILLION BATTERY STORAGE PROJECT?***

13 ***A36.*** The Settlement as a package violates the second and third prongs for PUCO
14 approval because its provisions will harm customers, fails to promote the
15 public interest, and violates important regulatory principles and practices. In
16 particular, this proposal lack sufficient detail and support for these expenditures
17 at this time. Any proposed battery storage project that seeks to avoid otherwise
18 required reliability expenditures should be accompanied by an obligation to
19 prepare and submit for review a specific cost benefit analysis and documentation
20 as to the criteria for the location of such projects, the analysis that will justify its
21 proposal, and evaluation criteria to allow the public to determine that the project
22 had its intended results. Allowing Duke to obtain an additional \$20 million in cost
23 recovery for projects that are not otherwise documented as more cost effective

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1 than more traditional circuit specific investments is likely to result in higher costs
2 to customers and the potential for double recovery of reliability related
3 investments already allowed under Rider DCI. Given the defects in this proposal
4 that I have identified, the battery storage project proposal should be rejected as
5 failing to document customer benefits or the public interest and is likely to lead to
6 imprudently incurred charges imposed on customers in violation of standard
7 regulatory principles.

8

9 ***Q37. DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?***

10 ***A37.*** Yes. I reserve the right to incorporate new information that may subsequently
11 become available through outstanding discovery or otherwise.

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing *Direct Testimony of Barbara R. Alexander on Behalf of the Office of the Ohio Consumers' Counsel* was served via electronic transmission to the persons listed below on this 25th day of June 2018.

/s/ William J. Michael
William J. Michael
Assistant Consumers' Counsel

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Summary: Testimony Direct Testimony of Barbara R. Alexander in Opposition to the Joint Stipulation and Recommendation On Behalf of The Office of the Ohio Consumers' Counsel electronically filed by Ms. Jamie Williams on behalf of Michael, William Mr.