

BEFORE THE  
PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Filing by Ohio Edison )  
Company, The Cleveland Electric )  
Illuminating Company, and The Toledo )  
Edison Company for a Distribution Platform )  
Modernization Plan )  
)

Case No. 17-2436-EL-UNC

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**DIRECT TESTIMONY OF**

**DAVID J. KARAFI**

**ON BEHALF OF**

**OHIO EDISON COMPANY  
THE CLEVELAND ELECTRIC ILLUMINATING COMPANY  
THE TOLEDO EDISON COMPANY**

December 1, 2017

1 **INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.**

3 A. My name is David J. Karafa. I am employed by FirstEnergy Service Company as Vice  
4 President, Distribution Support. My business address is 76 S. Main Street, Akron, OH  
5 44308.

6 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL QUALIFICATIONS AND**  
7 **EMPLOYMENT EXPERIENCE.**

8 A. I began my career with The Cleveland Electric Illuminating Company in 1981. I  
9 subsequently held a variety of management positions within various FirstEnergy entities  
10 including Overhead Line Supervisor, Claims Manager, Underground Network Manager,  
11 Operations Support Director, Operations Services Director, Energy Delivery Performance  
12 and Process Improvement Director, President of Metropolitan Edison Company, President  
13 of Ohio Edison Company and Pennsylvania Power Company, and President of  
14 FirstEnergy's Pennsylvania distribution utilities. I was promoted to my current position  
15 in 2015.

16 **Q. PLEASE DESCRIBE YOUR CURRENT ROLES AND RESPONSIBILITIES.**

17 A. In my current role as Vice President, Distribution Support, I am responsible for providing  
18 support to all distribution utilities of FirstEnergy Corp., including Ohio Edison Company,  
19 The Cleveland Electric Illuminating Company ("CEI"), and The Toledo Edison Company  
20 (collectively, the "Companies"). The supporting services provided by my organization  
21 include Operations Services, Operations Support, Workforce Development, Work  
22 Management & Performance Improvement, Outage Management, Vegetation  
23 Management, and Emergency Preparedness.

1 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

2 A. The purpose of my testimony is to describe the Companies' proposed Distribution Platform  
3 Modernization ("DPM") Plan and its overall policy objectives. In my testimony, I will  
4 discuss relevant information supporting the filing, provide an overview of the DPM Plan,  
5 including the significant customer benefits expected to be achieved, and introduce the other  
6 witnesses of the Companies who are sponsoring the specific aspects of the DPM Plan. I  
7 sponsor the DPM Plan attached to the Companies' Application as Attachment A, which I  
8 incorporate into my testimony.

9 **BACKGROUND**

10 **Q. DO THE COMPANIES MEASURE AND REPORT RELIABILITY**  
11 **PERFORMANCE?**

12 A. Yes. The Companies have been reporting their reliability performance against approved  
13 performance standards since 2010. The standards were approved in Case No. 09-759-EL-  
14 ESS.

15 **Q. PLEASE DESCRIBE THE COMPANIES' RELIABILITY STANDARDS?**

16 A. Each Company has a System Average Interruption Frequency Index ("SAIFI") and  
17 Customer Average Interruption Duration Index ("CAIDI") reliability standard. SAIFI  
18 represents the average number of interruptions per customer. CAIDI represents the average  
19 time required to restore service per interrupted customer.

20 **Q. HAVE THE COMPANIES MET THESE STANDARDS?**

21 A. Yes. The following table demonstrates the Companies' performance against the reliability  
22 standards since inception.

Ohio Edison								
Index	2010	2011	2012	2013	2014	2015	2016	Minimum Standard
SAIFI	0.89	0.86	0.85	0.71	0.70	0.88	0.79	1.11
CAIDI	102.53	113.76	105.83	100.78	108.89	100.63	104.78	114.37

CEI								
Index	2010	2011	2012	2013	2014	2015	2016	Minimum Standard
SAIFI	0.98	1.18	0.96	0.86	1.03	1.02	1.02	1.30
CAIDI	114.98	116.87	107.35	99.55	103.23	125.04	110.44	135.00

Toledo Edison								
Index	2010	2011	2012	2013	2014	2015	2016	Minimum Standard
SAIFI	0.61	0.64	0.61	0.52	0.51	0.62	0.55	1.00
CAIDI	92.01	106.71	91.88	100.87	104.54	98.43	96.57	112.33

**Q. ARE CUSTOMERS' EXPECTATIONS FOR RELIABILITY ALIGNED WITH THE COMPANIES' PERFORMANCE?**

A. Yes. As shown in the table above, the Companies have consistently outperformed their reliability standards from 2010 through 2016, thereby demonstrating that the Companies are placing sufficient emphasis and dedicating sufficient resources to the reliability of their distribution systems. This conclusion is further supported by the results of the Companies' recent customer perception surveys. These surveys were completed in 2016 and included survey responses from 1,200 residential customers and 1,200 commercial customers in the Companies' service territories. Both residential and commercial customers surveyed showed favorable customer perception of the Companies' reliability performance. Of those customers that experienced outages, the large majority consider the number of interruptions reasonable.

1 **Q. ARE CUSTOMERS' EXPECTATIONS FOR RELIABILITY INCREASING?**

2 A. Yes. While the Companies' performance is currently aligned with customers' reliability  
3 expectations, the recent customer perception survey results indicate that customers'  
4 expectations are increasing. In comparison to prior customer perception surveys completed  
5 in 2008 and 2013, the 2016 survey results show that both residential and commercial  
6 customers expect their power to be restored faster. Expected outage restoration times for  
7 both weather and non-weather-related outages were lower in the 2016 survey results than  
8 in the previous two surveys. Additionally, when asked, 71% of residential customers and  
9 67% of commercial customers responded that "reducing the length of time it takes to  
10 restore power after an outage" was the most important thing that the Companies could do  
11 to improve service. The second most important thing for both residential and commercial  
12 customers was reducing the frequency of outages that last longer than five minutes.

13 **Q. COULD ADVANCEMENTS IN TECHNOLOGY AND OTHER INNOVATIONS**  
14 **HAVE AN IMPACT ON THE COMPANIES' PROVISION OF ELECTRIC**  
15 **SERVICE TO CUSTOMERS?**

16 A. Yes. The Companies acknowledge that customers' needs related to the provision of  
17 electric service are likely to change due to emerging technologies and other innovations  
18 that will be available to customers in the future. The Companies' expectations in this  
19 regard are informed by direct feedback received from customers, as well as information  
20 provided by various subject matter experts within the electric utility industry. A recent  
21 customer survey conducted by the Edison Electric Institute indicated that customers are  
22 "somewhat" or "extremely" interested in innovations such as online tools, renewable  
23 energy options, energy storage / batteries, and electric vehicle charging. In addition, the

1 Companies have also been active participants in the Commission’s PowerForward  
2 initiative, where they have had the chance to learn from vendors and other industry experts  
3 about various innovations, such as smart grid investments and distributed energy resources.  
4 Understanding their customers’ evolving needs, and finding ways to integrate new  
5 technologies into our distribution system without jeopardizing safety or reliability, are  
6 priorities for the Companies.

7 **Q. WHAT EXPERIENCES DO THE COMPANIES HAVE IN SUPPORTING SUCH**  
8 **INNOVATIONS AND ADDRESSING CUSTOMERS’ EXPECTATIONS FOR**  
9 **INCREASED RELIABILITY?**

10 A. The Companies were awarded a Smart Grid Investment Grant from the Department of  
11 Energy with matching recovery granted by the Commission in 2009. Through this grant,  
12 the Companies invested in a pilot area located in CEI’s service territory to deploy and study  
13 the impact of various grid modernization investments, including investments similar to  
14 those being proposed in the DPM Plan (the “Smart Grid Modernization Initiative” or  
15 “SGMI Project”). The Companies have been successful in achieving reliability  
16 improvements in the pilot area. Specifically, the Companies have seen a 26 percent  
17 improvement in service restoration time and a 12 percent reduction in the number of power  
18 outages. In addition, the Companies prepared and filed a Grid Modernization Business  
19 Plan (“Business Plan”)<sup>1</sup> that identified three potential scenarios for grid modernization  
20 deployment. During the development of this filing, the Companies studied and analyzed  
21 opportunities for grid modernization investments across their service territories on a much

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<sup>1</sup> See *In the Matter of the Filing by Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company of a Grid Modernization Business Plan*, Case No. 16-481-EL-UNC.

1 larger scale than the pilot area discussed above, and identified work that needs to be  
2 completed to enable the benefits of further grid modernization investment in the future.  
3 Through these activities, the Companies have gained valuable knowledge of the benefits  
4 their customers receive from a modernized grid; this knowledge contributed significantly  
5 to the development of the proposed DPM Plan.

6 **Q. PLEASE DESCRIBE THE COMMISSION’S POWERFORWARD INITIATIVE.**

7 A. PowerForward is the PUCO’s review of the latest in technological and regulatory  
8 innovation that could serve to enhance the consumer electricity experience. Through this  
9 series of workshops, the Commission intends to chart a clear path forward for future grid  
10 modernization projects, innovative regulations and forward-thinking policies. To date, two  
11 phases of this initiative have been conducted and a third is expected to be conducted in  
12 2018.

13 **Q. WILL THE DPM PLAN DISRUPT OR OTHERWISE PRESUPPOSE THE**  
14 **OUTCOME OF THE COMMISSION’S POWERFORWARD INITIATIVE?**

15 A. No. In fact, the proposed DPM Plan is an effective complement to PowerForward and is  
16 consistent with its objectives. The Companies have been active participants in each of the  
17 first two phases of the PowerForward initiative. The Companies remain fully supportive  
18 of PowerForward and will continue to participate in it going forward. The DPM Plan is an  
19 important interim step for the Companies to begin modernizing their distribution system  
20 and “charting a path forward for future grid modernization projects” in the Companies’  
21 service territories. While the DPM Plan will put the Companies in a better position to  
22 enable future grid modernization investments, the customer benefits achieved through the

proposed DPM Plan will continue in the future, independent of the outcome of PowerForward or any future grid modernization directives.

**Q. WHAT DO YOU RECOMMEND?**

A. Providing safe and reliable electric service to customers while continuing to meet customers' expectations and needs remain top priorities for the Companies. There is an opportunity for the Companies to address customers' increasing reliability expectations and evolving needs, while making investments that will modernize the Companies' distribution system and prepare it for future grid modernization investments, all to the benefit of customers. The DPM Plan will allow the Companies to take advantage of this opportunity. Thus, I recommend the Commission approve the Companies' DPM Plan.

**OVERVIEW OF DPM PLAN**

**Q. PLEASE PROVIDE AN OVERVIEW OF THE DPM PLAN.**

A. The DPM Plan is a portfolio of work that will modernize the Companies' distribution system, provide meaningful benefits to customers, and enable future grid modernization investment. The categories of work included in the DPM Plan are: circuit ties, circuit reconductoring, recloser installations, Supervisory Control and Data Acquisition ("SCADA") System, and Advanced Distribution Management System ("ADMS"). Under the DPM Plan, the Companies expect to make capital investments totaling \$450 million over a three-year period. This work is needed to help modernize the Companies' distribution system and better enable the Companies to make future grid modernization investments. All investments as part of the DPM Plan will be made consistent with good utility practice.



1 **Q. PLEASE SUMMARIZE THE WITNESSES THAT WILL BE TESTIFYING IN**  
2 **SUPPORT OF THE DPM PLAN.**

3 A. The various provisions of the DPM Plan are addressed by five witnesses. The Companies'  
4 witnesses, and the general topics that each will address in their pre-filed direct testimony,  
5 are:

- 6 • Mark Vallo – circuit ties, circuit reconductoring, recloser installations, SCADA;
- 7 • Lisa Rouse – ADMS;
- 8 • William Beutler – estimated reliability improvements and improved storm restoration
- 9 times, estimated customer benefits;
- 10 • Brandon Bolon – cyber security;
- 11 • Brandon McMillen – cost recovery, summary of the cost vs. benefit analysis.

12 **Q. IS THE WORK INCLUDED IN THE DPM PLAN INCREMENTAL TO THE**  
13 **COMPANIES' BASE WORK NEEDED TO MAINTAIN SAFE AND RELIABLE**  
14 **SERVICE TO CUSTOMERS?**

15 A. Yes. Each year, the Companies make capital investments to maintain safe and reliable  
16 service to customers. These investments focus largely on maintaining, and expanding as  
17 needed, the Companies' distribution system as currently configured. Examples of this work  
18 include: circuit inspections, vegetation management, worst-performing circuit remediation,  
19 pole inspections, storm restoration, and installation of facilities to serve new or expanding  
20 customers. While the Companies' existing system provides safe, reliable service to  
21 customers, it must be transformed in order to meet increasing customer expectations for a  
22 multi-directional, customer-oriented grid of the future. Thus, the work in the DPM Plan is  
23 incremental to this base level of work because it transforms the underlying configuration

1 and architecture of the Companies' distribution system, thereby laying the foundation for  
2 improving the customer experience via a future multi-directional grid that may include grid  
3 modernization investments such as distribution automation, distributed energy resources,  
4 advanced metering infrastructure, integrated Volt/VAR control, and innovative consumer  
5 end-use technologies (without presupposing which innovations will be adopted by  
6 consumers). Accordingly, the work included in the DPM Plan is comprised of grid  
7 modernization infrastructure and is clearly distinguishable from the Companies' normal  
8 base spend. More detailed explanations of each category of work included in the DPM Plan  
9 are provided in Attachment A to the Companies' Application and in the direct testimonies  
10 of Companies' witnesses Vallo and Rouse.

11 **Q. PLEASE SUMMARIZE THE ESTIMATED BENEFITS TO CUSTOMERS FROM**  
12 **THE DPM PLAN.**

13 A. The DPM Plan is expected to provide immediate, meaningful benefits to customers in terms  
14 of improved reliability and quicker storm restoration. While these investments will  
15 modernize the Companies' distribution system and better support and enable future grid  
16 modernization investments, the benefits from the DPM Plan are also self-sustaining and will  
17 continue into the future independent of other grid modernization investments that may be  
18 made. By making these investments now as part of the DPM Plan, customers will  
19 experience immediate benefits while benefiting from a more gradual transition to a modern  
20 grid. As discussed in the Application and the testimonies of witnesses Vallo and Rouse,  
21 each category of work included in the DPM Plan is integrated with and builds upon the  
22 benefits of the others. Accordingly, all categories of work included in the DPM Plan need  
23 to be implemented together to optimize the benefits to customers from the DPM Plan. As

1 proposed, the DPM Plan is estimated to provide significant benefits to customers in excess  
2 of the associated costs. The estimated benefits of the DPM Plan are quantified in the  
3 testimony of witness Beutler; the estimated costs are sponsored by witnesses Vallo and  
4 Rouse; and the results of the cost/benefit analysis are summarized by witness McMillen.

5 **Q. WHAT OTHER SAFEGUARDS AND PROTECTIONS WILL BE EMPLOYED BY**  
6 **THE COMPANIES WHEN IMPLEMENTING THE DPM PLAN?**

7 A. As part of the DPM Plan, the Companies will proactively manage and address potential  
8 risks associated with cyber security and concerns with the investments from the DPM Plan  
9 becoming obsolete before the end of their useful lives. As explained in the direct testimony  
10 of witness Bolon, the Companies have a robust cyber security policy in place and have  
11 significant experience in this area that will allow them to continually monitor, assess, and  
12 mitigate potential cyber security risks. In terms of the risk of equipment obsolescence, the  
13 majority of the infrastructure to be installed as part of the DPM Plan does not rely on new  
14 or emerging technologies, but rather, is investment in the Companies' distribution system  
15 that has been proven to have a long useful life. For the software and communications  
16 components of the DPM Plan, the Companies have already taken some mitigation measures,  
17 and will continue to be diligent going forward to make prudent decisions with respect to  
18 these investments. These efforts are discussed in more detail in the direct testimonies of  
19 witnesses Bolon, Vallo and Rouse.

20 **Q. HOW WILL THE COMMISSION BE ABLE TO ENSURE THAT THE**  
21 **COMPANIES' INVESTMENTS AS PART OF THE DPM PLAN ARE**  
22 **REASONABLE?**

1 A. First, the investments made as part of the DPM Plan are expected to result in significant net  
2 benefits to customers. As discussed in the testimony of Companies' witness Beutler and  
3 summarized in the direct testimony of Companies' witness McMillen, the estimated net  
4 benefits to customers are \$2.0 billion, which yields a benefit-to-cost ratio of 3.4. These  
5 calculations are based on reasonable methodologies that can be relied upon by the  
6 Commission. Second, as discussed in the DPM Plan and in the testimonies of witnesses  
7 Vallo and Rouse, these investments are needed to support and enable future grid  
8 modernization. Third, the Companies will have resources dedicated to the ongoing  
9 administration, management, tracking, and reporting of the DPM Plan projects to ensure  
10 that the costs are prudently incurred and recorded appropriately. Finally, all costs associated  
11 with the DPM Plan that are sought for recovery will be subject to the annual audit of Rider  
12 AMI. The annual audit will include a review of the Companies' adherence to the DPM  
13 Plan, and a determination of whether the amounts sought for recovery associated with the  
14 DPM Plan are not unreasonable based on the facts and circumstances known at the time the  
15 investments were made.

16 **Q. ARE THE COMPANIES SEEKING ANY MODIFICATIONS TO THEIR**  
17 **BUSINESS PLAN FILING AT THIS TIME?**

18 A. No. While some of the DPM Plan work was included as preparatory, foundational work in  
19 the Business Plan, the majority of the investments in the Companies' Business Plan were  
20 comprised of larger-scale, longer-term deployment of other advanced technologies and grid  
21 modernization investments. In the ESP IV case, the Commission indicated that it will  
22 address the Companies' Business Plan filing upon completion of the PowerForward

1 initiative.<sup>2</sup> The Companies support that position by the Commission and recommend that  
2 the DPM Plan can and should be addressed now without disruption to the progress of the  
3 PowerForward initiative. To the extent there are changes needed to the Companies'  
4 Business Plan as a result of the DPM Plan or the outcome of PowerForward, the Companies  
5 will make those modifications at that time.

6 **CONCLUSION**

7 **Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.**

8 A. The DPM Plan will provide significant benefits to customers in terms of improved reliability  
9 and a more gradual transition to grid modernization. Implementation of the DPM Plan will  
10 address customers' increasing expectations for reliability and evolving needs related to the  
11 provision of electric service, while modernizing the Companies' distribution platform and  
12 enabling future grid modernization investments. The DPM Plan should be approved as soon  
13 as possible so that customers can start to realize the benefits.

14 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

15 A. Yes; however, I reserve the right to supplement my testimony.  
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<sup>2</sup> Case No. 14-1297-EL-SSO, Fifth Entry on Rehearing at pp. 96-97 (Oct. 12, 2016).

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