BEFORE THE ARKANSAS PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE FORMULA RATE PLAN FILINGS OF **OKLAHOMA GAS GAS AND ELECTRIC COMPANY** PURSUANT TO APSC DOCKET NO. 16-052-U	)))))	DOCKET NO. 18-046-FR

Direct Testimony

of

Zachary Gladhill

on behalf of

Oklahoma Gas and Electric Company

Q. **Please state your name, position, by whom you are employed, and your business address.**

A. My name is Zachary Gladhill. I am the Distributed Energy Resource Director for Oklahoma Gas and Electric Company ("OG&E"). My business address is 321 N. Harvey, Oklahoma City, Oklahoma, 73102.

Q. **Please state your educational qualifications and employment history.**

A. I received a Bachelor of Science in Mechanical Engineering from Oklahoma Christian University and a Master of Business Administration from Arizona State University. I have been employed by OG&E since 2004, and have held various positions within the organization including most recently, Plant Director of Seminole Power Plant and my current position, Distributed Energy Resource Director.

Q. **Please describe your current role and responsibilities.**

A. My primary duties as Distributed Energy Resource Director include leading the development and integration of the grid modernization program in Arkansas and Oklahoma. This includes working closely with multiple groups within the organization including finance, information technology, regulatory, and operations to understand the internal and external implications of the grid modernization and develop the vision for deployment. Once a project is underway, I provide direction and oversight to the execution team. I am responsible for the development of the grid modernization project, and presenting the project for approval from our executive leadership team.

In addition to grid modernization, I lead our distributed energy resource ("DER") efforts, working closely with multiple groups within the organization to develop project concepts, assist in sales support, customer integration, and coordination of internal and external policy and interconnection requirements. For example, I serve on the Association of Edison Illuminating Companies ("AEIC") DER subcommittee, and work with multiple utilities to share learnings and standardize on best practices relative to DER projects and integration. I also serve as the contract manager and point of contact for our involvement with the Electric Power Research Institute ("EPRI"). In this role, I determine which

research projects and programs that we participate in, as well as distribute information and key learnings to others in my organization.

Q. **Have you previously testified before this Commission?**

A. No, I request that my credentials be accepted at this time.

Q. **What is the purpose of your testimony?**

A. The purpose of my testimony is to discuss OG&E's grid modernization in Arkansas and the associated investments during the filing year and provide sufficient evidence to secure approval of these projects.

Q. **Please describe OG&E's grid modernization program.**

A. OG&E's grid modernization program is a continuation of our Smart Grid project. This program focuses on improving the distribution grid to provide better control and visibility to the system, while improving reliability and storm resiliency for the benefit of our customers. This multiyear program, spanning OG&E's service territory in both Arkansas and Oklahoma, will reach nearly all of our approximately 847,000 customers. The program began in 2018 in Arkansas by focusing on 14 circuits in the Ft. Smith and Van Buren metropolitan areas impacting nearly a third of our Arkansas customers.

Q. **Why is grid modernization important?**

A. Grid modernization will allow more streamlined operation of the distribution system, resulting in improved reliability and faster response time. As our customer's reliability expectations continue to increase and technology matures, the distribution grid must evolve to meet these growing expectations and deliver a product that provides increased value to all customers. Additionally, it will provide visibility to the system to aide in the integration of customer and utility owned DER.

Q. **What type of work is being conducted under the grid modernization program?**

A. The 2018 work is a combination of integrity and technology projects. Integrity projects such as substation breakers, transformers, underground cable, and structure replacements

are foundational to the advancement of the distribution grid of the future. Technology projects such as digital relays and distribution automation devices will integrate with our existing technology platforms to allow improved visibility to the distribution system. This work will continue in Arkansas in 2019, expanding to include additional circuits and will likely conclude in Arkansas by spring of 2021.

Q. **What types of capital investments are included in the filing year?**

A. The 2018 grid modernization plan includes the deployment of structural integrity, functional integrity and technology assets across 14 circuits in the Ft. Smith area. This deployment consist of a mix of structural integrity, functional integrity, and technology assets. Structural integrity assets such as poles, crossarms, and overhead conductor are foundational in the grid modernization plan deployment. New breakers, transformers and switches modernize the existing infrastructure by adding communication capabilities. The deployment of new technology, such as automated reclosers and switches, enhances visibility and control of the distribution system while reducing the number of interruptions to our customers. The integrity and technology allocation for 2018 will be approximately 60% and 40%, respectively.

Q. **Was there a focus on a particular group of customers?**

A. Yes. Part of the criticality analysis is to get the greatest benefit for customers out of every dollar spent. In the case of our approximately 67,000 customers in Arkansas, starting with Commercial and Industrial (C&I) customers will have the greatest benefit in the initial year of grid modernization. Specifically, OG&E recognizes that momentary and sustained interruptions have an impact to our C&I customers as well as the local economy. Using the Department of Energy's ("DOE") Interruption Cost Estimate ("ICE") calculator, discussed below, we quickly determined that industrial and commercial customers have the highest economic impact for a given area. By providing more reliable energy OG&E can positively affect C&I customers' performance which allows them to impact the welfare of the citizens of Arkansas and in particular the Ft. Smith area. By focusing on circuits where there is a larger number of C&I customers, the economic and system performance

benefits can be better managed and measured. Additionally, by impacting businesses we can have a wider impact with the employees and patrons of those businesses.

Q. **Please describe the DOE's ICE calculator.**

A. The DOE ICE Calculator is an electric reliability planning tool designed for electric reliability planners at utilities, government organizations, and other entities that are interested in estimating interruption costs and/or the benefits associated with reliability improvements. The calculator was first released in 2011 and updated in 2015 and 2018. OG&E uses the ICE Calculator to help estimate the benefits of reliability improvements to customers and the estimated customers' cost of a single interruption event.

The software has two modules. First, the Estimate Interruption Costs module creates estimates of cost per interruption event per average kilowatt (kW), per unserved Kilowatt hour (kWh) and the total cost of the sustained interruption. Second, the Estimated Value of Reliability Improvement module provides estimates of the value associated with a specified reliability improvement. OG&E used the second, Estimated Value of Reliability Improvement module to estimate the customer value for the Arkansas Grid Modernization program.

The Estimated Value of Reliability Improvement model outputs are state specific and utilize the number of non-resident and residential customers using current actual customer counts, along with investment specific information. Other fields include Initial Year of Improvement, Expected Annual Inflation Rate, Expected Lifetime of Improvement and a Discount Rate. Lastly, the model copies the initial reliability numbers for every year in the expected lifetime of improvement using System Average Interruption Frequency Index ("SAIFI"), System Average Interruption Duration Index ("SAIDI") and Customer Average Interruption Duration Index ("CAIDI"). The model allows each year of the reliability numbers to be modified, this enables the utility to reflect what is expected over periods of time.

The Estimated Value of Reliability Improvement model outputs are by residential, small commercial and industrial customers and medium/large commercial and industrial customers. The benefit is stated in total for each customer class and benefit per customer in dollars. There is also a table and graphs by year depicting the estimated customer cost

without the improvement, with the improvement and the net or total benefit to the customers.

Q. **Did OG&E only focus on C&I customers?**

A. No. Our primary goal is to improve system performance for all customers. Even though the cost benefit analysis favors the targeting of C&I customers, all customers on the initial 14 circuits, which amount to about 22,000 individual meters (89% residential and 11% Commercial and Industrial), are expected to see a positive impact from the system improvements.

Q. **How were the 14 circuits targeted for 2018 chosen?**

A. Our team reviewed approximately 87 circuits in Arkansas using a criticality and condition analysis. The criticality was determined using a mix of total circuit load and customers per mile. Naturally, circuits with C&I customers and located in population dense areas have higher circuit load. The condition analysis included asset age, interruption counts (momentary and sustained), and SAIDI and CAIDI reliability indices. Once the total score for each circuit was computed, we then looked at the feasibility and impact of work on each substation. From a feasibility perspective, it makes sense to improve all circuits within a substation and not only the circuit identified by our criticality and condition analysis. This approach was chosen to match each circuit in terms of technology and deployment. Finally, with this prioritized list we reviewed and further quantified the number of momentary outages affecting our C&I customers per circuit as an opportunity for improvement by means of new technology.

Q. **What is the proposed grid modernization investment in 2018?**

A. Of the approximately $20 million proposed investment included in the FRP filing this year, approximately 46% is allocated to structural integrity, 16% functional integrity and 38% grid technology enhancements. The proposed plant investment is 90% distribution line and 10% distribution substation. Specifically, the project classes are defined as Transformer Load Management, Proactive Underground Cable replacement, Lightning Outage Reduction, Steel and Copper Overhead Conductor replacement, Distribution

Automation Circuit Feeder, Distribution Automation Circuit Lateral, Enhanced Distribution Line Wildlife Protection, Electromechanical Relay replacement, Targeted Breaker and Recloser replacement, Proactive Bushing replacement, Targeted Power Transformer replacement, Enhanced Substation Wildlife Protection, SCADA (Supervisory Control and Data Acquisition) Substation Upgrade and installation.

Q. **What are the benefits to the customers?**

A. Over the course of three years, on average, customers should experience an improvement in their energy reliability experience, the number of momentary outages and increased resiliency to storms. Customers on these circuits should expect, over the next three years, to see a SAIDI reduction of 54 minutes, contributing an approximately 19 minute improvement to the overall Arkansas SAIDI. The deployment of integrity projects will lower storm related outages, allowing more repairs to be planned rather than reactive, lowering storm costs associated with emergency repairs. This resiliency, along with the improved grid visibility provided by the technology deployment, is likely to reduce truck rolls and improve response time, ultimately lessening the impact of outages on our customers. These improvements will help reduce both momentary and sustained outages to all customer classes, and will also help C&I customers avoid lost revenues associated with service interruptions, estimated by the DOE calculator to be approximately $20 million over a 20 year period.

Q. **Does this conclude your testimony?**

A. Yes.

CERTIFICATE OF SERVICE

I, Lawrence E. Chisenhall, Jr., hereby state that a copy of the foregoing instrument was served on all the parties of record via the APSC Electronic Filing System on this the 1st day of October, 2018.

/s/ Lawrence E. Chisenhall, Jr.

Lawrence E. Chisenhall, Jr.