FirstEnergy Statement No. 7-R

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Verizon Pennsylvania LLC and Verizon North LLC

v.

Metropolitan Edison Company, Pennsylvania Electric Company, and Pennsylvania Power Company
Docket No. C-2020-3019347

Rebuttal Testimony
of
Clark Guo

List of Topics Addressed

Statistically-Reliable Estimates of Rate Formula Input Variables

NON-PROPRIETARY VERSION

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REBUTTAL TESTIMONY
OF
CLARK GUO

I. INTRODUCTION AND PURPOSE

Q. Please state your name and business address.

A. My name is Clark Guo. My business address is 5940 S. Rainbow Blvd., Las Vegas, Nevada 89118.

Q. By whom are you employed and in what capacity?

A. I am the Chief Executive Officer of Precision Consulting LLC.

Q. Would you please describe Precision Consulting LLC?

A. Precision Consulting LLC is an academic and business consulting firm.

Q. What is your educational background?

A. I have a B.S. in Mathematics and Economics from the California Institute of Technology. I also have an M.S. in Economics from Boston University.

Q. Have you previously testified as a witness before the Pennsylvania Public Utility Commission ("Commission")?

A. No.

Q. Have you been retained by Metropolitan Edison Company ("Met-Ed"), Pennsylvania Electric Company ("Penelec"), and Pennsylvania Power Company ("Penn Power") (collectively, "FirstEnergy" or the "Companies") to testify on behalf of the

Companies in this proceeding involving the Formal Complaint filed by Verizon Pennsylvania LLC and Verizon North LLC (collectively, "Verizon")?

A. Yes.

Q. What is the purpose of your rebuttal testimony?

A. My testimony will explain how I developed statistically-reliable estimates of rate formula input variables that have been relied upon by FirstEnergy in its rate calculations.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes, attached to my testimony as CONFIDENTIAL FirstEnergy Exhibit CG-1 is a copy of my expert report dated February 1, 2019, which the Companies attached to their Answer to Verizon's Formal Complaint.

II. RATE FORMULA INPUT VARIABLES

Q. Would you please provide some background on what FirstEnergy asked you to prepare in this proceeding?

A. I was asked to produce a statistically valid random sample that would produce estimates of rate formula input variables representing characteristics of the FirstEnergy electric distribution systems that would be sufficient to produce a 95% confidence level for analysis. These rate formula input variables would then be used by FirstEnergy to calculate rates pursuant to the Federal Communications Commission's ("FCC") rate formulas.

Q. Please identify the rate formula input variables that you analyzed statistically.

A. Tables 3 and 4 of my report show the variables that I analyzed. For FirstEnergy-owned poles, I calculated the descriptive statistics for: pole length; unusable space; number of attaching entities; lowest height of Verizon's attachments; and space occupied by Verizon's attachments. For Verizon-owned poles, I calculated descriptive statistics for: pole length; space occupied by FirstEnergy; and space required by FirstEnergy.

Q. Were you able to develop the estimates of these variables?

A. Yes. Using FirstEnergy's Geographic Information System ("GIS") database as a starting point, I used a random number generator to select a random sample of poles of sufficient quantity to be used in a field audit survey. FirstEnergy provided me with the results of the field audit survey data performed by Davey Resource Group ("DRG"), which I then analyzed to produce the descriptive statistics found in my report, which is attached hereto as CONFIDENTIAL FirstEnergy Exhibit CG-1.[1] The sample included a total of 1,150 FirstEnergy poles and a total of 1,141 Verizon poles, for a total of 2,291 poles. Based on that sample, I produced for each operating company: (1) descriptive statistics for the FirstEnergy-owned poles and for Verizon's attachments to FirstEnergy-owned poles, which are shown in Table 3 of the report; and (2) descriptive statistics for FirstEnergy's attachments to Verizon's poles, which are shown in Table 4 of the report.

Q. Are the estimates of rate formula input variables presented in your expert report statistically reliable?

[1] This report was originally submitted in both of Verizon's FCC complaint proceedings before the complaint involving Met-Ed, Penelec, and Penn Power was transferred to this Commission. As a result, the figures shown in the report also include Potomac Edison Company, which is not a part of this proceeding.

A. Yes. The mean (average) values calculated for these variables are statistically valid estimators of the population values for poles in service territories of the three FirstEnergy operating utilities that have both FirstEnergy and Verizon attachments.

Q. How can such a small proportion of the total number of poles be statistically reliable?

A. A core feature of statistical sampling and analysis is that the proportion of the population is not the determinant of the reliability of the results. The larger the sample, the closer one gets to a 100% confidence in the statistics for any large population. This can be seen in Table 1 of my report, where decreasing increments of confidence require increasing increments of sample size. Of course, cost is always a concern, particularly as the smaller and smaller increase in confidence or accuracy comes at an exponentially higher cost of data collection. When the sample is randomly selected, as I have done here, a sufficient number of observations will produce a statistic that reliably represents the population. As noted above and in my report, I selected the sample sizes necessary to produce estimates with a 95% confidence level. It is the same statistical method widely used in everything from marketing research to manufacturing quality control.

Q. Please summarize the results of your report.

A. My report provides the sample average values for the variables identified in the report. Because the sample was randomly drawn from the population, these averages represent the true population means within a 95% confidence level threshold. In my opinion, these sample statistics can be used to represent the population values.

III. CONCLUSION

Q. Does this conclude your rebuttal testimony?

A. Yes, it does.

FirstEnergy
Exhibit CG-1
(CONFIDENTIAL)