BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

IN THE MATTER OF THE POWERFORWARD DISTRIBUTION SYSTEM PLANNING WORKGROUP	)))))))	**CASE NO. 18-1596-EL-GRD**

CURRENT-STATE ASSESSMENT REPORT OF OHIO EDISON COMPANY, THE CLEVELAND ELECTRIC ILLUMINATING COMPANY AND THE TOLEDO EDISON COMPANY

Pursuant to the Attorney Examiner's Finding and Order dated February 27, 2019, Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company (the "Companies") hereby submit the Current-State Assessment Report of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company, which is attached hereto as Exhibit A.

Respectfully submitted,

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On behalf of Ohio Edison Company, The Toledo Edison Company, and The Cleveland Electric Illuminating Company

Exhibit A

Current-State Assessment Report of Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company

I. Introduction

Consistent with the PowerForward Roadmap and pursuant to the Commission's February 27, 2019 Finding and Order in *In the Matter of the PowerForward Distribution System Planning Workgroup*, PUCO Case No. 18-1596-EL-GRD (the "Order"), Ohio Edison Company ("OE"), The Cleveland Electric Illuminating Company ("CEI"), and The Toledo Edison Company ("TE") (collectively, the "Companies") are pleased to submit this Current-State Assessment Report (the "Report") of the Companies' distribution system. The Report includes an evaluation of the Companies' current system characteristics, an overview of the distribution planning process and projects resulting from the planning process, and the software tools used for planning.[1] It also includes an overview of distributed generation interconnection processes, the organization structure for planning and interconnection, and relevant planned technology investments.[2]

The Companies have been and continue to be active participants in the Commission's PowerForward initiative, including all phases held throughout 2017 and 2018. The Companies are committed to grid modernization efforts, and recently filed a Stipulation in Case Nos. 17-2436-EL-UNC, et al., that provides for the first phase of significant grid modernization investments by the Companies over a three-year period, called "Grid Mod I." The Stipulation provides a significant step towards modernizing the Companies' grid, while setting up a collaborative process to discuss and evaluate future phases of investment.[3] The Companies will also continue to engage in the robust discussions of the PowerForward Collaborative, the Data and Modern Grid Workgroup, and the Distribution System Planning Workgroup.

While the Companies welcome a constructive dialogue regarding the planning of distribution systems and the interconnection of distributed energy resources ("DERs"), it is important to recognize that the Companies and other Ohio EDUs must maintain their roles as managers of the distribution planning process and owners of their distribution systems. Utilities are the experts on their own distribution systems and are solely responsible for maintaining safety and reliability. Because every system is unique, utilities are in the best position to determine the appropriate distribution planning and interconnection standards to protect the safety of customers, workers and the public safety, as well as system integrity, while working toward the modernization of their electric grids.

II. Current-State Assessment Report

A. System Characteristics

As of December 2018, CEI serves approximately 750,000 customers, OE serves approximately 1,000,000 customers and TE serves approximately 300,000 customers. Approximately 34,000 CEI customers currently have Advanced Metering Infrastructure ("AMI") meters, which were installed as part of the United States Department of Energy Smart Grid Investment Grant program, in which a Consumer Behavior Study was conducted from 2012-2014. In addition, approximately 1,000 CEI customers, 1,200 OE customers and 450 TE customers have interval meters.

[1] *See* Roadmap at 18-19.

[2] *Id.*

[3] The Stipulation is currently pending before the Commission. *See* Case No. 17-2436-EL-UNC, et al., Supplemental Stipulation and Recommendation (Jan. 25, 2019).

The Companies' distribution system is composed of approximately 640 substations and 2,900 circuits. Roughly half of the circuits serve critical facilities. A subset of the substations have station breaker control through Supervisory Control and Data Acquisition ("SCADA").

B. Overview of the Distribution Planning Process, Including Frequency, Duration and Roles and Responsibilities of Stakeholders Involved.

Each of the Companies' planning engineers are responsible for planning the distribution system for their respective Company. A distribution transformer level load forecast is prepared annually to calculate growth rates for each distribution transformer based on historical summer peak loads. A distribution transformer level winter load forecast is prepared based on winter peak loads for winter peaking and winter critical areas. This transformer level load forecast is developed by weather-normalizing the previous season's peak load, adjusting for contingencies, adding in customer load additions including DER, and applying an area growth rate. The transformer level load forecasts are compared to the Companies' planning criteria to identify potential substation equipment thermal overloads, evaluate load relief alternatives, and document load relief solutions.

Potential thermal overloads and power quality problems are identified using the Companies' standard circuit analysis tools. The Companies use the CYMDIST Distribution System Analysis module on the CYME International Inc. software platform as their distribution circuit modeling tool. CYMDIST is used to identify loading and voltage problems on the distribution circuit at the customer service level. The Companies use the CYMTCC Protective Device Coordination module on the CYME software platform as their circuit protection coordination tool to ensure proper coordination of distribution circuit protective devices from the transmission side of the substation transformer to the end of the distribution circuit. These tools are described further below in Section II.F.

C. Categories of Projects that Result from the Planning Process, Types of Projects Within Each Category and Percent of Expenditures in Each Category.

The categories of projects that arise from the planning process are capacity projects, such as new substations or circuits, and reinforcement projects, such as transformer replacement and capacitor additions. The planning process results in load relief projects ranging from small line rebuilds, capacitor installations, and regulator installations, to distribution projects such as major line rebuilds, substation capacity additions, or the installation of a new distribution substation. The planning process is also used to identify areas where load shifts are required between substations to affect load relief without capital investment.

Currently, the Companies are not experiencing widespread load growth that would independently require new substations, new circuits, or system reinforcement. A small percentage of the Companies' 2018 capital budget was attributable to projects identified in the planning process. Accordingly, the majority of the Companies' current base capital expenditures relate to Commission-required programs (such as circuit inspections, pole inspections, and worst performing circuits), connections for new construction, failures/repairs, reliability maintenance projects, road or other relocation projects, joint use connections, and company facilities.

D. Planning Assumptions, Including Growth Rates and Design Criteria.

Although the Companies are not experiencing widespread growth, the Companies continue to monitor loads on existing infrastructure comparing the existing load to known equipment ratings.

E. Load and DERs Forecasting Methods.

The Companies use a load forecasting data management system ("LFDMS"), described below in Section II.F., to project load growth at the circuit, substation, or area level. In this model, small DER installations are included with the new load measurements. Large DER installations are entered as negative load growth.

F. Software Tools Used for Planning, Including Forecasting, System Modeling and Mapping, Power Flow Analysis, System Protection, and Hosting Capacity Analysis.

The Companies use CYME software for planning. CYME power system analysis software is a commercial suite of advanced simulation tools assisting transmission and distribution power engineers. CYME is modular software that works in an integrated fashion to perform a number of advanced analysis functions. The core modules include:

- CYMTCC Protective Device Coordination: This program generates the time-current characteristic curves for the protective devices on a given distribution feeder. CYMTCC can be used in an integrated fashion with CYMDIST to help identify device coordination and loading issues.

- CYMDIST Distribution System Analysis: CYMDIST analyzes balanced or unbalanced three-phase and single-phase systems that are operated in radial, looped or meshed configurations. The CYMDIST module includes per-phase voltage drop and power flow analysis, fault calculations (fault flows and fault voltages), protective device coordination (by interfacing with CYMTCC), optimal capacitor placement and sizing, load balancing, and load allocation/estimation. CYMDIST is also equipped with add-on modules to perform more specialized analyses such as predictive and historical reliability analysis, contingency analysis, harmonic analysis, switching (tie-points) optimization, and more.

- Graphic Information System ("GIS") Distribution Circuit Configuration, Loads, & Devices: GIS is a geospatial database of the Companies' distribution system, and includes much of the data necessary to perform a CYMTCC study, such as conductor sizes and lengths, operating voltages, protective device locations and sizes, capacitor locations and sizes, regulator locations and sizes, distribution transformer locations, sizes, and customer loads.

- Load Forecasting Data Management System ("LFDMS"): LFDMS is the tool used to capture historic circuit and station loads (weather adjusted), planned major load additions, subtractions and transfers, and to incorporate that data into forecasted loads at the circuit, substation, or area level. The system compares forecasted loads to equipment ratings to determine potential investment needs.

G. Existing DERs (All Types) Connected to the Distribution System.

The Companies currently have over 1,500 customers who have DERs connected to the Companies' system. These DERs include solar, wind, combined heat and power, diesel generators and landfill gas engines.

H. Overview of Distributed Generation Interconnection Processes, Including Technical Screening Rules for Fast-Tracking Applications and Inclusion of Updates to Key Standards.

The Companies' internal interconnection processes are governed by the provisions of the Commission-approved Interconnection Tariffs and the applicable sections of the Ohio Revised Code. The purpose of the Interconnection Tariffs "is to implement Ohio Revised Code Section 4928.11, which calls for uniform interconnection standards that are not unduly burdensome or expensive and also ensure safety and reliability, to the extent governing authority is not preempted by Federal law."[4]

I. Interconnection Request Volumes and Average Time to Approve Applications.

During 2018, the Companies received 274 applications for photovoltaic installations. The customer interconnection application process requires that all information be complete before proceeding. The Companies work with applicants to submit complete and accurate data needed to process their applications, including site plans, drawings, inverter specifications, Net Energy Metering Rider signature pages, locations of disconnect switches, payments, proofs of inspection, etc. Once a complete application has been submitted, it will typically be reviewed and receive conditional approval within 5 business days.

J. Organization Structure for Planning and Interconnection, Including Number of Employees and Descriptions of Roles and Responsibilities.

Each of the Companies has a local engineering department, whose responsibilities include, but are not limited to, planning, protection, reliability measurement and improvement, customer complaint and power quality resolution, budget and portfolio management, project management, line design and estimation, customer generator interconnection, and other day-to-day operational duties. The Companies have adequate planning and protection staff within their engineering departments, as well as corporate support.

K. Descriptions of Existing and Planned Energy Efficiency and Demand Response Programs, and How They are Integrated into Distribution Planning.

A description of the Companies' existing energy efficiency programs can be found in the Companies' current approved Energy Efficiency and Peak Demand Reduction Program Portfolio Plan in Case No. 16-0743-EL-POR. As customers implement energy efficiency or demand response programs, the resulting changes in load are captured in LFDMS and integrated into the distribution planning process.

[4] *See* P.U.C.O. No. 11 Original Sheet No. 82 (OE Interconnection Tariff); P.U.C.O. No. 13 Original Sheet No. 95 (CEI Interconnection Tariff); P.U.C.O. No. 8 Original Sheet No. 76 (TE Interconnection Tariff).

L. Proposed Use Cases, Methodology and Timeline for Hosting Capacity Analyses ("HCA") and Other Relevant Analyses.

Due to the relatively low volume of interconnections, the Companies currently do not conduct bulk-hosting capacity analyses.

M. Proposed Non-Wires Alternatives ("NWA") Suitability Criteria, Identification of Candidate Capacity, and Voltage or Reliability Projects for NWA Pilots.

As part of their current Energy Efficiency and Peak Demand Reduction Program Portfolio Plan, the Companies are investigating the feasibility of using geotargeted energy efficiency measures as an alternative to certain distribution system upgrades.

N. Any Relevant Planned Technology Investments (e.g. AMI, ADMS) and How They Will Be Used to Support or Improve Distribution Planning.

As mentioned above, the Companies' Grid Mod I stipulation is currently pending before the Commission. Grid Mod I provides for the Companies' first phase of significant grid modernization and includes investments such as AMI, Distribution Automation and Integrated Volt Var Control, as well as an Advanced Distribution Management System.[5]

III. Conclusion

The Companies appreciate the opportunity to submit this Current-State Assessment Report and look forward to collaborating with the Commission, Commission Staff, and other interested parties on this and other initiatives outlined in the Roadmap.

[5] *See* PUCO Case Nos. 17-2436-EL-UNC, et al., Stipulation and Recommendation (Nov. 9, 2018) and Supplemental Stipulation and Recommendation (Jan. 25, 2019).

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Current-State Assessment Report of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company was filed electronically through the Docketing Information System of the Public Utilities Commission of Ohio on this 1st day of April, 2019. The PUCO's e-filing system will electronically serve notice of the filing of this document on counsel for all parties.

/s/ Emily V. Danford
An Attorney for Ohio Edison Company, The Toledo Edison Company, and The Cleveland Electric Illuminating Company

Summary: Report Current-State Assessment Report of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company electronically filed by Ms. Emily V Danford on behalf of The Cleveland Electric Illuminating Company and Ohio Edison Company and The Toledo Edison Company