# **MEMORANDUM**

TO: Missouri Public Service Commission Official Case Files File No. EO-2017-0073 Union Electric Company d/b/a Ameren Missouri File No. EO-2017-0074 Kansas City Power & Light Company File No. EO-2017-0075 KCP&L Greater Missouri Operations Company File No. EO-2017-0076 The Empire District Electric Company FROM: J. Luebbert, Utility Engineering Specialist III /s/John A. Rogers 10/24/2016 /s/Kevin Thompson 10/24/2016 Manager Energy Resources Department Staff Counsel Department SUBJECT: Long Term Potential for Distributed Generation in Missouri DATE: October 24, 2016

### Background

During the Agenda meeting on October 19, 2016, Chairman Hall requested Staff provide:

- 1. The complete responses (including any studies) in the 2015 Chapter 22 triennial compliance filings of Kansas City Power & Light Company ("KCPL") and KCP&L Greater Missouri Operations Company ("GMO") to special contemporary issue "e," contained in the Commission's October 22, 2014, orders in File Nos. EO-2014-0040 and EO-2014-0041, respectively; and
- 2. Any additional information Staff can provide concerning the long-term potential for distributed electrical generation in Missouri.

### **2015 Triennial Compliance Filing of KCPL and GMO**

KCPL addressed special contemporary issue "e" in Volume 8, pages 17 and 18 of its Triennial Compliance Filing, File No. EO-2015-0254:

There is a substantial amount of uncertainty regarding distributed solar generation over a 20-year planning horizon. Nearly 100% of KCP&L's existing distributed solar generation is attributed to the Missouri law in which KCP&L paid up to \$2.00/watt in rebates for customer-installed solar generation. Pursuant to that Missouri law, a one-time rebate cap was established not to exceed \$36.5M. KCP&L has approximately \$2M in remaining funds at \$1.00/watt. Distributed

solar generation as a result of the rebates realized its peak in 2014, with approximately 9 MW of installed capacity. Subsequent to the rebate level decline from \$1.50 to \$1.00, KCP&L has only received 4 Net Metering applications YTD. Currently, there is a lack of relevant data, particularly in the Midwest to support any representative forecast that has a measurable impact. KCP&L will continue to track the development and cost of distributed generation as well as the intake of Net Metering applications for future resource planning.

GMO addressed special contemporary issue "e" in Volume 8, pages 18 and 19 of its Triennial Compliance Filing, File No. EO-2015-0252:

There is a substantial amount of uncertainty regarding distributed solar generation over a 20-year planning horizon. Nearly 100% of GMO's existing distributed solar generation is attributed to the Missouri law in which GMO paid up to \$2.00/watt in rebates for customer-installed solar generation. Pursuant to that Missouri law, a one-time rebate cap was established not to exceed \$50M. Those funds were all committed in November of 2013 and have since been exhausted. Distributed solar generation as a result of the rebates realized its peak in 2013 and 2014, with approximately 12MW of installed capacity per year. Once rebate funds were committed, application intake declined to less than .5MW, a 96% decline. Currently, there is a lack of relevant data, particularly in the Midwest to support any representative forecast that has a measurable impact. GMO will continue to track the development and cost of distributed generation as well as the intake of Net Metering applications for future resource planning.

KCPL and GMO included the following in Volume 1: Executive Summary, in File Nos. EO-2015-0254 and EO-2015-0252, respectively:

#### 9.5 DISTRIBUTED GENERATION AND PHOTOVOLTAIC SYSTEMS MARKET RESEARCH STUDY

KCP&L [and GMO are] participating with other utilities in an E Source market research study that will provide critical, timely information to help understand what motivates large and midsize business customers to acquire photovoltaic (PV) and other distributed generation (DG) technologies. It will also reveal which customers are most likely to reduce their demand for traditional utilityprovided electricity.

Data will be gathered using a combination of qualitative and quantitative techniques on customer attitudes, desires, barriers, and actions that are essential to understand in order to create a viable PV and DG strategy. The E Source study covers the US and Canada and includes key market segments such as retail, grocery, healthcare, government, manufacturing, hotels and motels, data centers, and education. The DG questions focus on the following technologies: microturbines / combustion turbines,

reciprocating engines, fuel cells, battery storage, thermal storage, combined heat and power (CHP), and waste heat recovery.

E Source will field a national survey, conduct customer interviews, perform research, and conduct analysis from January to April 2015. In addition, E Source will also field an oversample from the KCP&L service territory expected to be completed in the fall of 2015. The report and findings of the primary study is expected to be published in the spring of 2015.

On October 21, 2016, Staff received from KCPL files and work papers related to the E Source market research study concerning solar photovoltaic systems and distributed generation.<sup>1</sup> Appendix A was among the files received on October 21 and contains the HIGHLY CONFIDENTIAL *How Photovoltaic Systems and Distributed Generation Will Disrupt the Utility Industry: 2015 Research Results on Business Customer Acquisition of Systems for KCP&L* published March, 2015.

Appendix B contains KCPL's potential study discussion regarding CHP from its 2015 IRP triennial compliance filing in File No. EO-2015-0254.

Appendix C contains GMO's potential study discussion regarding CHP from its 2015 IRP triennial compliance filing in File No. EO-2015-0252.

### 2016 Chapter 22 Filings Concerning Special Contemporary Issue "e"

The Commission's special contemporary issue "e" contained in File Nos. EO-2016-0037, EO-2016-0038, EO-2016-0039, and EO-2016-0040 is the same special contemporary issue "e" discussed in Ameren Missouri's 2016 IRP annual update filing, KCPL's 2016 IRP annual update filing, GMO's 2016 IRP annual update filing, and Empire's 2016 IRP triennial compliance filing, respectively:

e. Analyze and document the range of potential levels of distributed generation in [utility's name] service territory for the 20-year planning horizon and the potential impacts of each identified level of distributed generation, and in particular distributed solar generation, on [utility's name] preferred resource plan. The potential impacts should quantify both the amount of electrical energy the distributed generation is expected to provide to the grid and the amount of electrical energy that the distributed generation customers are expected to consume on site that will offset the amount that the company would normally provide to those customers.

<sup>&</sup>lt;sup>1</sup> The E Source market research study is referenced in Section 9.5 of the Volume 1: Executive Summary in File Nos. EO-2015-0254 and EO-2015-0252.

In its 2016 IRP annual update filing response to special contemporary issue "e," Ameren Missouri refers to its 2014 IRP triennial compliance filing for its response to all special contemporary issues.<sup>2</sup> Appendix D contains Ameren Missouri's discussion of solar generation and distributed generation in its 2014 IRP triennial compliance filing in File No. EO-2015-0084.

Appendix E contains KCPL's response to special contemporary issue "e" in its 2016 IRP annual update filing in File No. EO-2016-0232.

Appendix F contains GMO's response to special contemporary issue "e" in its 2016 IRP annual update filing in File No. EO-2016-0233.

Appendix G contains Empire's response to special contemporary issue "e" in its 2016 IRP triennial compliance filing in File No. EO-2016-0223.

Concerning Appendix E and Appendix F, on October 19, 2016, KCPL advised Staff that the EPRI supplemental project to study methods for forecasting solar PV adoption is still in progress. Appendix H is a summary of the EPRI supplemental project on forecasting solar PV adoption. The Solar PV Adoption Tool—currently under development—is scheduled for release in early 2017.

### **Additional Comments**

The United States Department of Energy recently released a study titled *Combined Heat and Power (CHP) Technical Potential in the United States.* Information that is specific to Missouri regarding CHP potential can be found on the following pages of the report:<sup>3</sup>

- Page 6 provides an illustration of the national existing CHP by state;
- Pages 22 through 32 provide information regarding the national on-site technical potential by state;
- Page 59 provides a profile for the State of Missouri; and
- Pages D-51 and D-52 provide a detailed breakdown of Missouri technical potential by

<sup>&</sup>lt;sup>2</sup> In its Order in File EO-2012-0039 establishing special contemporary issues to be evaluated by Ameren Missouri in its 2012 IRP Annual Update, the Commission noted that, "the requirement to examine special contemporary issues should not be allowed to expand the limited annual update report into something more closely resembling a triennial compliance report." Ameren Missouri agrees with the Commission that the scope and depth of an IRP Annual Update should not be comparable to that for a triennial IRP filing. Also, in its Order in File EO-2016-0037 establishing special contemporary issues for Ameren Missouri's 2016 IRP Annual Update, the Commission stated if the Company believes it has already adequately addressed some of these issues in a previous IRP filing, then it does not need to undertake any additional analysis in its IRP filing.

<sup>&</sup>lt;sup>3</sup> <u>http://www.energy.gov/sites/prod/files/2016/04/f30/CHP%20Technical%20Potential%20Study%203-31-2016%20Final.pdf</u>

application and size range.

## **Recommendation**

Should the Commission decide to order Ameren Missouri to include the following as a special contemporary issue in File No. EO-2017-0073, Staff recommends that the Commission also order KCPL in File No. EO-2017-0074, GMO in File No. EO-2017-0075, and Empire in File No. EO-2017-0076 to include this special contemporary issue in its next Chapter 22 triennial compliance filing due on April 1 of 2018, 2018 and 2019, respectively:

Include the following as uncertain factors that may be critical to the performance of alternative resource plans in accordance with 4 CSR 240-22.060(5)(M):

- 1. Foreseeable emerging energy efficiency technologies;
- 2. Foreseeable energy storage technologies; and
- 3. Foreseeable distributed generation, including but not limited to, distributed solar generation, combined heat and power (CHP), and microgrid formation.

Staff is making this recommendation at this time due to the anticipated long lead time necessary for each utility to prepare for and perform the work related to an assessment of these additional uncertain factors in accordance with 4 CSR 240-22.060(5)(M).