

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange	Chair
Dan Lipschultz	Commissioner
Matthew Schuenger	Commissioner
Katie J. Sieben	Commissioner
John A. Tuma	Commissioner

In the Matter of Xcel's 2017 Hosting  
Capacity Study

ISSUE DATE: July 19, 2018

DOCKET NO. E-002/M-17-777

ORDER ACCEPTING STUDY AND  
SETTING FURTHER REQUIREMENTS

**PROCEDURAL HISTORY**

On November 1, 2017, Xcel Energy (Xcel) filed its 2017 Hosting Capacity Study (the Study).

On November 30, 2017, Communities United for Responsible Energy (CURE) filed comments recommending that steps be taken to encourage public participation in Commission energy planning proceedings.

On February 2, 2018, the Commission received comments on the Study from Fresh Energy, the Interstate Renewable Energy Council (IREC), and the Department of Commerce, Division of Energy Resources (the Department).

On February 28, 2018, the Commission received reply comments from the Institute for Local Self-Reliance (ILSR); Fresh Energy, IREC, the Department; and Xcel.

On May 31, 2018, the Study came in front of the Commission.

**FINDINGS AND CONCLUSIONS**

**I. Hosting Capacity Study**

Minn. Stat. § 216B.2425, subd. 8, directs a public utility that is subject to the statute and operating under a multi-year rate plan to conduct a distribution study that identifies interconnection points on its distribution system for small-scale distributed generation resources, as well as the upgrades necessary for continued development of such resources. Under the statute, the study must be conducted biennially and included in the utility's biennial transmission projects report, but Xcel has agreed to conduct the study annually and therefore files the Study separately.

Xcel emphasized that its 2017 Study is an analysis of the capacity of individual feeders and not the cumulative effects of Distributed Energy Resources (DER), which the Company stated it will

independently analyze. In conducting its Study, Xcel incorporated guiding principles developed by industry experts who recommend that such studies be granular; repeatable; scalable; transparent; proven; and available. According to Xcel, the Study also achieves the following purposes: it identifies distribution feeder capacity for DER; it streamlines interconnection studies; and it addresses annual long-term distribution planning.

Xcel also asserted that the Study is responsive to, and in compliance with, the Commission's prior order directing, among other things, the following:

- The 2017 Hosting Capacity Report must be detailed enough to provide developers with a reliable estimate of the available level of hosting capacity per feeder at the time of submittal of the report to the extent practicable. The information should be sufficient to provide developers with a starting point for interconnection applications.
- The 2017 Hosting Capacity Report must be detailed enough to inform future distribution system planning efforts and upgrades necessary to facilitate the continued efficient integration of distributed generation.
- Xcel must file a color-coded, map-based representation of the available Hosting Capacity down to the feeder level. This information should be provided to the extent it is consistent with what Xcel believes are legitimate security concerns. If security concerns arise, Xcel must explain in detail the basis for those concerns.
- Xcel must provide the Hosting Capacity results in downloadable, MS-Excel or other spreadsheet file formats.<sup>1</sup>

In conducting its Study, Xcel used the Distributed Resource Integration and Value Estimation (DRIVE) tool developed by the Electric Power Research Institute. The tool is based on years of research that incorporates detailed hosting capacity analysis (by comparing power flow results) to screen for voltage, thermal, and system protection impacts of DER. In its filing, Xcel identified the Study's methodology and assumptions, as well as the method used to assess the accuracy of the Study. The upgrades necessary for continued support of distributed generation directly correlate to the type of constraints identified, and the Study identifies potential solutions for increasing hosting capacity.

## **II. Comments on the Study**

The Department stated that Xcel's Study satisfies the two primary components of the statute by identifying a reasonable and sufficient number of interconnection points on the distribution system, as well as upgrades necessary to support continued development of distributed generation resources. The Department also stated that the Study satisfies the requirements set forth by the Commission in its prior order.

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<sup>1</sup> *In the Matter of Xcel Energy's Biennial Transmission and Distribution Plan: Distribution System Study – Hosting Capacity Report*, Docket No. E-002/M-15-962, Order Setting Additional Requirements for Xcel's 2017 Hosting Capacity Report (August 1, 2017).

After analyzing the methodology and assumptions used in the Study, the Department concurred that they were reasonable but also recommended improvements for future studies. In particular, the Department stated that the Company could increase accuracy by comparing results across methods and itemizing the criteria used for selecting feeders. The Department also stated that the Study's analysis of distribution upgrades and costs could be improved by incorporating additional data, such as the frequency of constraints on individual feeders and the cost of mitigation options.

IREC questioned the Study's assumptions, the limitations of the DRIVE tool, and the accuracy of the results. To address these issues and improve future studies, IREC offered extensive recommendations, including that Xcel be directed to use multiple analytical methods in addition to the DRIVE tool, file more frequent data updates (monthly rather than annually), and include more detailed and granular data in the DRIVE tool and accompanying schemata. IREC also recommended increasing access to data used in the DRIVE tool to enhance the public's understanding of the methodology used by the Company.

Fresh Energy concurred that there are issues with the method used to conduct the Study and made a number of recommendations for future studies. Specifically, Fresh Energy recommended that Xcel analyze minimum and maximum load data, which is relevant to understanding peak load and identifying potential solutions. Fresh Energy also recommended that the Company conduct sensitivity analyses that show the impact of varying assumptions and that the Company identify all planned projects, including their operating characteristics, which are intended to increase hosting capacity.

ILSR concurred with the recommendations identified by other stakeholders for improving studies going forward, and also recommended that the Commission require Xcel to hire an independent third party to conduct the study to ensure that the analysis is not biased against the development of distributed generation resources.

In response to the parties' comments, Xcel acknowledged the value of improving future studies as the process evolves and as industry standards for conducting such studies are refined. Xcel addressed the range of recommendations, concurring on some changes and further responding to parties' request for more detailed information.

### **III. Commission Action**

Although the Study is not subject to approval, the Commission recognizes that increasing the Study's accuracy will facilitate its usefulness in both identifying meaningful system upgrades that support further DER development and improving the quality of grid information available to those seeking interconnection. Identifying changes that can improve the quality of the Study furthers the statute's underlying policy objectives, and the Commission therefore appreciates the thorough and incisive analyses of the parties and their continuing participation in this ongoing process.

The Commission concurs with the Department that the Study complies with the statutory requirements to identify interconnection points on the system and necessary upgrades to support continued development of distributed generation resources, and the Commission will therefore accept the Study.

The Commission is also mindful, however, of the importance of more fully exploring stakeholder recommendations and will therefore request that Xcel, in its next annual filing, address the following:

- a. consider the methodological options to both improve and measure accuracy of the hosting capacity analysis, including identification and analysis of industry best practices and an explanation of the Company's methodological choice;
- b. consider the feasibility and practicality of including the results of both the Small Distributed methodology and the Large Centralized methodology in future hosting capacity analyses;
- c. conduct a sensitivity analysis;
- d. explore a range of options for better presenting the public-facing results of the Hosting Capacity Analysis after consideration of, but not limited to, any security and privacy issues that may be implicated in providing more detailed information and what information might be useful to developers and stakeholders;
- e. provide an update in each report on the evolving capability of the EPRI DRIVE tool and whether it is capable of incorporating the technologies included in the broadened definition of DERs;
- f. file more detailed data on load profile assumptions used in the analysis, including peak load (kW) by substation and feeder; and
- g. file supplemental information that would result in a broader understanding of how to guide distribution upgrades for additional hosting capacity.

The Commission will also carry over requirements from the Commission's most recent prior order, as set forth in the ordering paragraphs below.

### **ORDER**

1. The Commission hereby accepts Xcel Energy's 2017 Hosting Capacity Report as in compliance with the Commission's August 1, 2017 Order and with Minn. Stat. § 216B.2425, subd. 8.
2. Xcel's 2018 Hosting Capacity Report must be detailed enough to provide developers with a reliable estimate of the available level of hosting capacity per feeder at the time of submittal of the report to the extent practicable. The information should be sufficient to provide developers with a starting point for interconnection applications.
3. Xcel's 2018 Hosting Capacity Report must be detailed enough to inform future distribution system planning efforts and upgrades necessary to facilitate the continued efficient integration of distributed generation.
4. Xcel must file a color-coded, map-based representation of the available Hosting Capacity down to the feeder level. This information should be provided to the extent it is consistent with what Xcel believes are legitimate security concerns. If security concerns arise, Xcel must explain in detail the basis for those concerns.
5. Xcel must provide the Hosting Capacity results in downloadable, MS-Excel or other spreadsheet file formats.

6. Xcel must provide information on the accuracy of the Hosting Capacity Report information; both estimates on the accuracy of the 2018 report and an analysis of the 2017 results compared to actual hosting capacity determined through any interconnection studies or other reasonable metric.
7. The Commission hereby requests that Xcel Energy address stakeholder recommendations in the Company's 2018 Hosting Capacity Report filing, including:
  - a. consider the methodological options to both improve and measure accuracy of the hosting capacity analysis, including identification and analysis of industry best practices and an explanation of the Company's methodological choice;
  - b. consider the feasibility and practicality of including the results of both the Small Distributed methodology and the Large Centralized methodology in future hosting capacity analyses;
  - c. conduct a sensitivity analysis;
  - d. explore a range of options for better presenting the public-facing results of the Hosting Capacity Analysis after consideration of, but not limited to, any security and privacy issues that may be implicated in providing more detailed information and what information might be useful to developers and stakeholders;
  - e. provide an update in each report on the evolving capability of the EPRI DRIVE tool and whether it is capable of incorporating the technologies included in the broadened definition of DERs;
  - f. file more detailed data on load profile assumptions used in the analysis, including peak load (kW) by substation and feeder; and
  - g. file supplemental information that would result in a broader understanding of how to guide distribution upgrades for additional hosting capacity.
8. The hosting capacity report identified in Minn. Stat. § 216B.2425, subd. 8, may be filed separately from the Biennial Transmission Projects Report.
9. Xcel must file a Hosting Capacity Report on an annual basis by November 1 each year.
10. This order shall become effective immediately.

BY ORDER OF THE COMMISSION



Daniel P. Wolf  
Executive Secretary

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