

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

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

In the Matter of Distribution System Planning
for Xcel Energy

ISSUE DATE: August 30, 2018

DOCKET NO. E-002/CI-18-251

ORDER APPROVING INTEGRATED
DISTRIBUTION PLANNING FILING
REQUIREMENTS FOR XCEL ENERGY

PROCEDURAL HISTORY

Over the last several years, the Commission has investigated the modernization of the electric grid and distribution-system planning as they relate to rate-regulated utilities.¹ At the April 19, 2018 agenda meeting, the Commission reviewed staff-proposed draft integrated distribution planning (IDP) filing requirements informed through a Commission-led stakeholder process, and heard party comments.² The proposed IDP filing requirements would direct utilities to engage in a stake-holder process and to file plans addressing: short-term and long-term distribution system modifications and investments, considerations used in related planning processes, non-traditional distribution system alternatives, and long-term distribution system forecasts, among other requirements.

At the May 31, 2018 agenda meeting, the Commission requested Xcel Energy (Xcel) to file a Grid Modernization Report,³ as required under Minn. Stat. 216B.2425, in combination with any IDP filing the Commission may direct the Company to make in this docket.

On June 8, 2018, the Commission issued a notice of comment period on the draft IDP requirements for Xcel. The notice requested that Xcel file a narrative on the Company's

¹ See generally Docket No. E-999/CI-15-556 (grid modernization) and Docket No. E-002/M-17-776 (Xcel 2017 Biennial Report).

² In addition to Xcel, the Commission has established individual dockets and released proposed utility-specific IDP filing requirements for the following rate-regulated utilities: Docket No. E-017/18-253 (Otter Tail Power); Docket No. E-015/18-254 (Minnesota Power); and Docket No. E-111/ 18-255 (Dakota Electric Association).

³ Docket Nos. E-002/M-17-775 and E-002/M-17-776, Order Approving Pilot Program, Setting Reporting Requirements, and Denying Certification Requests (August 7, 2018).

proposed distributed energy resource penetration scenarios for its 2018 IDP requirements. The Notice also included a list of topics for party comments, including:

1. Should the draft IDP requirements be modified? If so, provide specific edits with rationale and indicate the intent of the proposed change.
2. Are there specific scenarios, inputs, or assumptions that Xcel should consider in its initial filing? What are reasonable medium and high scenarios?
3. Please address the following areas (in reference to the attached IDP requirements):
 - a) Are the annual or biennial filing requirements reasonable?
 - b) Are there additional parameters or requirements that should be part of stakeholder meetings?
 - c) Should the categories under financial data be modified? Are there consistent categories across utilities that could be utilized?
 - d) Should the long-term distribution system plan components be on a 10-year (shorter term) outlook or a 15-year outlook (to correspond with the integrated resource plan timing)?
4. Are there other issues or concerns related to this matter?

On July 6, 2018, the following parties submitted comments on Xcel's draft IDP:

- Center for Energy and the Environment
- Citizens Utility Board of Minnesota
- Minnesota Department of Commerce, Division of Energy Resources (Department)
- Fresh Energy
- Interstate Renewable Energy Council
- Kandiyo Consulting, LLC
- Office of the Attorney General - Residential Utilities Division (OAG)
- Xcel

On July 20, 2018, the following parties submitted reply comments:

- Center for Energy and the Environment
- Citizens Utility Board of Minnesota
- Department
- Fresh Energy
- Interstate Renewable Energy Council
- Xcel

On August 9, 2018, the Commission met to consider the matter.

FINDINGS AND CONCLUSIONS

I. Background of Commission Grid Modernization Efforts

Since 2016, the Commission has considered a phased process for efforts to modernize the electrical grid. The Commission determined that distribution system planning was the most reasonable way to assist in grid evolution, and commenced efforts to create a comprehensive and coordinated integrated distributed system planning process in Minnesota, guided by the following principles and planning objectives:

- Maintain and enhance the safety, security, reliability, and resilience of the electricity grid, at fair and reasonable costs, consistent with the state's energy policies.
- Enable greater customer engagement, empowerment, and options for energy services.
- Move toward the creation of efficient, cost-effective, accessible grid platforms for new products and services, with opportunities for adoption of new distributed technologies.
- Ensure optimized use of electricity grid assets and resources to minimize total system costs.

In October 2016, the Commission held a workshop seeking stakeholder input and discussion of a Minnesota-based distribution system planning effort. In 2017, the Commission issued, and assessed utility and stakeholder responses to a questionnaire designed to ascertain 1) each utility's current planning for its distribution system, 2) the status of each utility's current-year distribution plan, and 3) the utilities' recommendations for improving the current distribution planning process.

In April 2018, the Commission established individual IDP dockets for each rate-regulated utility and authorized the release of utility-specific draft IDP filing requirements for utility and stakeholder comment. Each utility's draft IDP was released for comments in June 2018.⁴

II. Xcel IDP Filing Requirements

A. Overview of Party Comments

The parties generally agreed that Xcel's distribution system is evolving, and that through IDP, the Commission can help to ensure that utilities are systematically planning their respective distribution systems – to maintain safe, reliable, and affordable service for customers as technological advancements are developed and proposed to come online. The parties also agreed that it is prudent to begin a planning process to ensure that the Commission's consideration of utility distribution system investments is well informed.

After two rounds of comments on the proposed IDP filing requirements, the parties generally agreed on the majority of topics raised. No party opposed the process or indicated that there was no need for an IDP. All party comments in this docket were thoughtful, thorough, and useful to the process as it unfolded.

⁴ Xcel's IDP filing requirements are the first to be considered by the Commission.

Commission staff prepared a detailed summary of the party comments and proposals, mapping out where suggestions came from and which were included in the final proposal, appended as Exhibit A to the staff briefing papers for the August 9, 2018 agenda meeting. At the Commission meeting, all parties supported use of the proposed IDP planning requirements as adapted and modified by Commission staff, and raised no objections to their use.

Certain parties also raised issues for future consideration, or deferral to a different docket. The Citizens Utility Board of Minnesota recommended that efforts should be continued to maximize the integration of distributed energy resources for all customers, minimize what might otherwise be stranded assets, and maximize existing product life. Fresh Energy raised hosting capacity as one area for additional improvement, but acknowledged that issues related to hosting capacity will likely be addressed in an existing hosting capacity docket, and the annual hosting capacity analysis to be filed November 1.

The OAG asked that in the future Xcel make efforts to provide the Commission with better information on its additional planning objectives, such as its investment plans for the near future in order to ensure ratepayer benefits. The Department's suggestions focused on ratepayer protection and benefit, and harmonizing the IDP requirements with other dockets relevant to IDP, such as hosting capacity.

Finally, Xcel stated that it understands that the filing requirements to be imposed in the IDP docket will apply to all of Xcel's IDP distribution planning, not just the discretionary 15-20 percent of its budget the utility discussed in its comments herein. Xcel also stated that it recognizes that it must provide and discuss its entire distribution budget in its upcoming November 2018 filing.

III. Commission Action

The Commission appreciates the participation and thorough analysis by the utilities and stakeholders on the myriad issues raised in this IDP docket. Stakeholder input into the iterative process has been a valuable resource in developing appropriate IDP requirements, solidifying planning objectives, clarifying draft language, and making modifications as appropriate. With the upcoming initial filing by Xcel, which will be made by November 1, 2018, as proposed by the Company, stakeholders and regulators should be able to better determine what information and detail is needed to meet the before-referenced planning objectives for IDP.⁵

The Commission hereby adopts the proposed IDP filing requirements for Xcel, as discussed and agreed upon in this docket and attached hereto.

⁵ See *infra* at 3.

ORDER

1. The Commission adopts the IDP filing requirements for Xcel as set forth herein and attached hereto.
2. This order shall become effective immediately.

BY ORDER OF THE COMMISSION

Daniel P. Wolf
Executive Secretary



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MINNESOTA INTEGRATED DISTRIBUTION PLANNING REQUIREMENTS
For Xcel Energy
Docket E002/CI-18-251

Planning Objectives: The Commission is facilitating comprehensive, coordinated, transparent, integrated distribution plans to:

- Maintain and enhance the safety, security, reliability, and resilience of the electricity grid, at fair and reasonable costs, consistent with the state’s energy policies;
- Enable greater customer engagement, empowerment, and options for energy services;
- Move toward the creation of efficient, cost-effective, accessible grid platforms for new products, new services, and opportunities for adoption of new distributed technologies; and,
- Ensure optimized utilization of electricity grid assets and resources to minimize total system costs.
- Provide the Commission with the information necessary to understand Xcel’s short-term and long-term distribution system plans, the costs and benefits of specific investments, and a comprehensive analysis of ratepayer cost and value.

Commission review of annual distribution system plans are not meant to preclude flexibility for Xcel to respond to dynamic changes and on-going necessary system improvements to the distribution system; nor is it a prudence determination of any proposed system modifications or investments.

For filing requirements which Xcel claims is not yet practicable or is currently cost-prohibitive to provide, Xcel shall indicate for each requirement:

1. Why the Company has claimed the information is not yet practicable or is currently cost-prohibitive;
2. How the information could be obtained, at what estimated cost, and timeframe;
3. What the benefits or limitations of filing the data in future reports as related to achieving the planning objectives;
4. If the information cannot be provided in future reports, what information in the alternative could be provided and how it would achieve the planning objectives.

Distribution System Plan Process

1. **Filing Date:** Require Xcel to file annually with the Commission beginning on November 1, 2018 an Integrated Distribution Plan (MN-IDP or IDP) for the 10-year period following the submittal. The Commission will either accept or reject a distribution system plan by June 1 (to the extent practicable) of the following year based upon the plan content and conformance with the filing requirements and Planning Objectives listed above. The plan will be reviewed and may be combined with the Biennial Distribution System Plan required by Minn. Stat. 216B.2425 and associated certification requests, as authorized in that docket (E002/M-17-776).
2. **Stakeholder Meeting(s):** Xcel should hold at least one stakeholder meeting prior to the November 1 filing of the Company’s MN-IDP to obtain input from the public. The stakeholder meeting should occur

in a manner timely enough to ensure input can be incorporated into the November 1 MN-IDP filing as deemed appropriate by the utility.

At a minimum, Xcel should seek to solicit input from stakeholders on the following MN-IDP topics: (1) the load and distributed energy resources (DER) forecasts; (2) proposed 5-year distribution system investments, (3) anticipated capabilities of system investments and customer benefits derived from proposed actions in the next 5-years; including, consistency with the Commission’s Planning Objectives (see above), and (4) any other relevant areas proposed in the MN-IDP.

Following the November 1 filing, the Commission will issue a notice of comment period. If deemed appropriate by staff, an additional stakeholder meeting may be held in combination with the comment period to solicit input.

- 3. Filing Requirements:** For purposes of these requirements, DER is defined as “supply and demand side resources that can be used throughout an electric distribution system to meet energy and reliability needs of customers; can be installed on either the customer or utility side of the electric meter.”¹ This definition for this filing may include, but is not limited to: distributed generation, energy storage, electric vehicles, demand side management, and energy efficiency.²

A. Baseline Distribution System and Financial Data:

System Data

1. Modeling software currently used and planned software deployments
2. Percentage of substations and feeders with monitoring and control capabilities, planned additions
3. A summary of existing system visibility and measurement (feeder-level and time interval) and planned visibility improvements; include information on percentage of system with each level of visibility (ex. max/min, daytime/nighttime, monthly/daily reads, automated/manual)
4. Number of customer meters with AMI/smart meters and those without, planned AMI-investments, and overview of functionality available
5. Discussion of how the distribution system planning is coordinated with the integrated resource plan (including how it informs and is informed by the IRP), and planned modifications or planned changes to the existing process to improve coordination and integration between the two plans
6. Discussion of how DER is considered in load forecasting and any expected changes in load forecasting methodology

¹ See *Minnesota Staff Grid Modernization Report, March 2016*.

² ICF Report, *Integrated Distribution Planning, August 2016*, prepared for Minnesota Public Utilities Commission, Docket No. E999/CI-15-556, available online: [See eDockets ID: 20169-124836-01](#).

7. Discussion if and how IEEE Std. 1547-2018³ impacts distribution system planning considerations (e.g. opportunities and constraints related to interoperability and advanced inverter functionality)
8. Estimated distribution system annual loss percentage for the prior year
9. For the portions of the system with SCADA capabilities, the maximum hourly coincident load (kW) for the distribution system as measured at the interface between the transmission and distribution system
10. Total distribution substation capacity in kVA
11. Total distribution transformer capacity in kVA
12. Total miles of overhead distribution wire
13. Total miles of underground distribution wire
14. Total number of distribution premises
15. Total costs spent on DER generation installation in the prior year. These costs should be broken down by category in which they were incurred (including application review, responding to inquiries, metering, testing, make ready, etc).
16. Total charges to customers/member installers for DER generation installations, in the prior year. These charges should be broken down by category in which they were incurred (including application, fees, metering, make ready, etc.)
17. Total nameplate kW of DER generation system which completed interconnection to the system in the prior year, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)
18. Total number of DER generation systems which completed interconnection to the system in the prior year, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)
19. Total number and nameplate kW of existing DER systems interconnected to the distribution grid as of time of filing, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)
20. Total number and nameplate kW of queued DER systems as of time of filing, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)
21. Total number of electric vehicles in service territory
22. Total number and capacity of public electric vehicle charging stations
23. Number of units and MW/MWh ratings of battery storage
24. MWh saving and peak demand reductions from EE program spending in previous year
25. Amount of controllable demand (in both MW and as a percentage of system peak)

Financial Data

26. Historical distribution system spending for the past 5-years, in each category:
 - a. Age-Related Replacements and Asset Renewal
 - b. System Expansion or Upgrades for Capacity

³ IEEE Standard 1547-2018, published April 6, 2018.

- c. System Expansion or Upgrades for Reliability and Power Quality
- d. New Customer Projects and New Revenue
- e. Grid Modernization and Pilot Projects
- f. Projects related to local (or other) government-requirements
- g. Metering
- h. Other

The Company may provide in the IDP any 2018 or earlier data in the following rate case categories:

- a. Asset Health
- b. New Business
- c. Capacity
- d. Fleet, Tools, and Equipment
- e. Grid Modernization

For each category, provide a description of what items and investments are included.

- 27. All non-Xcel investments in distribution system upgrades (e.g. those required as a condition of interconnection) by subset (e.g. CSG, customer-sited, PPA and other) and location (i.e. feeder or substation).
- 28. Projected distribution system spending for 5-years into the future for the categories listed above, itemizing any non-traditional distribution projects
- 29. Planned distribution capital projects, including drivers for the project, timeline for improvement, summary of anticipated changes in historic spending. Driver categories should include:
 - a. Age-Related Replacements and Asset Renewal
 - b. System Expansion or Upgrades for Capacity
 - c. System Expansion or Upgrades for Reliability and Power Quality
 - d. New Customer Projects and New Revenue
 - e. Grid Modernization and Pilot Projects
 - f. Projects related to local (or other) government-requirements
 - g. Metering
 - h. Other
- 30. Provide any available cost benefit analysis in which the company evaluated a non-traditional distribution system solution to either a capital or operating upgrade or replacement

DER Deployment

- 31. Current DER deployment by type, size, and geographic dispersion (as useful for planning purposes; such as, by planning areas, service/work center areas, cities, etc.)
- 32. Information on areas of existing or forecasted high DER penetration. Include definition and rationale for what the Company considers “high” DER penetration.
- 33. Information on areas with existing or forecasted abnormal voltage or frequency issues that may benefit from the utilization of advanced inverter technology.

B. Hosting Capacity and Interconnection Requirements

1. Provide a narrative discussion on how the hosting capacity analysis filed annually on November 1 currently advances customer-sited DER (in particular PV and electric storage systems), how the Company anticipates the hosting capacity analysis (HCA) identifying interconnection points on the distribution system and necessary distribution upgrades to support the continued development of distributed generation resources⁴, and any other method in which Xcel anticipates customer benefit stemming from the annual HCA.
2. Describe the data sources and methodology used to complete the initial review screens outlined in the Minnesota DER Interconnection Process.⁵

C. Distributed Energy Resource Scenario Analysis

1. In order to understand the potential impacts of faster-than-anticipated DER adoption, define and develop conceptual base-case, medium, and high scenarios regarding increased DER deployment on Xcel's system. Scenarios should reflect a reasonable mix of individual DER adoption and aggregated or bundled DER service types, dispersed geographically across the Xcel distribution system in the locations Xcel would reasonably anticipate seeing DER growth take place first.
2. Include information on methodologies used to develop the low, medium, and high scenarios, including the DER adoption rates (if different from the minimum 10% and 25% levels), geographic deployment assumptions, expected DER load profiles (for both individual and bundled installations), and any other relevant assumptions factored into the scenario discussion. Indicate whether or not these methodologies and inputs are consistent with Integrated Resource Plan inputs.
3. Provide a discussion of the processes and tools that would be necessary to accommodate the specified levels of DER integration, including whether existing processes and tools would be sufficient. Provide a discussion of the system impacts and benefits that may arise from increased DER adoption, potential barriers to DER integration, and the types of system upgrades that may be necessary to accommodate the DER at the listed penetration levels.
4. Include information on anticipated impacts from FERC Order 841⁶ (Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators) and a discussion of potential impacts from the related FERC Docket RM-18-9-000 (Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators)

⁴ Minn. Stat. 216B.2425, Subd. 8

⁵ Forthcoming Order, E999/CI-16-521, MN DIP 3.2 Initial Review

⁶ *Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 162 FERC ¶61,127 (February 28, 2018)

D. Long-Term Distribution System Modernization and Infrastructure Investment Plan

1. Xcel shall provide a 5-year Action Plan as part of a 10-year long-term plan for distribution system developments and investments in grid modernization based on internal business plans and the DER future scenarios.
2. Xcel shall provide a 5-year Action Plan for distribution system developments and investments in grid modernization based on internal business plans and considering the insights gained from the DER futures analysis, hosting capacity analysis, and non-wires alternatives analysis. The 5-year Action Plan should include a detailed discussion of the underlying assumptions (including load growth assumptions) and the costs of distribution system investments planned for the next 5-years (expanding on topics and categories listed above). Xcel should include specifics of the 5-year Action Plan investments. Topics that should be discussed, as appropriate, include at a minimum:
 - Overview of investment plan: scope, timing, and cost recovery mechanism
 - Grid Architecture: Description of steps planned to modernize the utility's grid and tools to help understand the complex interactions that exist in the present and possible future grid scenarios and what utility and customer benefits that could or will arise.⁷
 - Alternatives analysis of investment proposal: objectives intended with a project, general grid modernization investments considered, alternative cost and functionality analysis (both for the utility and the customer), implementation order options, and considerations made in pursuit of short-term investments. The analysis should be sufficient enough to justify and explain the investment.
 - System interoperability and communications strategy
 - Costs and plans associated with obtaining system data (EE load shapes, PV output profiles with and without battery storage, capacity impacts of DR combined with EE, EV charging profiles, etc.)
 - Interplay of investment with other utility programs (effects on existing utility programs such as demand response, efficiency projects, etc.)
 - Customer anticipated benefit and cost
 - Customer data and grid data management plan (how it is planned to be used and/or shared with customers and/or third parties)
 - Plans to manage rate or bill impacts, if any
 - Impacts to net present value of system costs (in NPV RR/MWh or MW)
 - For each grid modernization project in its 5-year Action Plan, Xcel should provide a cost-benefit analysis
 - Status of any existing pilots or potential for new opportunities for grid modernization pilots
3. In addition to the 5-year Action Plan, Xcel shall provide a discussion of its vision for the planning, development, and use of the distribution system over the next 10 years. The 10-

⁷ <https://gridarchitecture.pnnl.gov/>

year Long-Term Plan discussion should address long-term assumptions (including load growth assumptions), the long-term impact of the 5-year Action Plan investments, what changes are necessary to incorporate DER into future planning processes based on the DER futures analysis, and any other types of changes that may need to take place in the tools and processes Xcel is currently using.

E. Non-Wires (Non-Traditional) Alternatives Analysis

1. Xcel shall provide a detailed discussion of all distribution system projects in the filing year and the subsequent 5 years that are anticipated to have a total cost of greater than two million dollars. For any forthcoming project or project in the filing year, which cost two million dollars or more, provide an analysis on how non-wires alternatives compare in terms of viability, price, and long-term value.
2. Xcel shall provide information on the following:
 - Project types that would lend themselves to non-traditional solutions (i.e. load relief or reliability)
 - A timeline that is needed to consider alternatives to any project types that would lend themselves to non-traditional solutions (allowing time for potential request for proposal, response, review, contracting and implementation)
 - Cost threshold of any project type that would need to be met to have a non-traditional solution reviewed
 - A discussion of a proposed screening process to be used internally to determine that non-traditional alternatives are considered prior to distribution system investments are made.