BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Katie J. Sieben	Chair
Valerie Means	Commissioner
Matthew Schuerger	Commissioner
Joseph K. Sullivan	Commissioner
John A. Tuma	Commissioner

In the Matter of the Xcel Energy 2020 Hosting Capacity Report Under Minn. Stat. §216B.2425, Subd. 8.	ISSUE DATE: November 9, 2021 DOCKET NO. E-002/M-20-812 ORDER ACCEPTING REPORT, REQUIRING STAKEHOLDER WORKSHOPS, AND SETTING ADDITIONAL REQUIREMENTS

PROCEDURAL HISTORY

On November 2, 2020, Xcel Energy (Xcel) filed its 2020 Hosting Capacity Analysis (HCA) Report (the 2020 HCA Report).

On April 7, 2021, the Commission received comments on the 2020 HCA Report from the Department of Commerce, Division of Energy Resources (the Department); the Institute for Local Self-Reliance (ILSR); and the Interstate Renewable Energy Council, Inc (IREC).

By May 24, 2021, the Commission received reply comments from Xcel; the City of Minneapolis; and Fresh Energy.

On June 4, 2021, Xcel filed supplemental reply comments; and on July 26, the Department filed supplemental comments.

On August 4, 2021, Xcel filed a supplement to its 2020 HCA Report.

On September 16, 2021, IREC filed additional information.

On September 30, 2021, the matter came before the Commission.

FINDINGS AND CONCLUSIONS

I. Background

The Electric Power Research Institute (EPRI) defines hosting capacity as the amount of distributed energy resources (DER) that can be accommodated on the existing system without

adversely affecting power quality or reliability under existing control configurations and without requiring infrastructure upgrades.[1] An HCA evaluates a utility's distribution system to find locations where DER may interconnect, as well as mitigation measures that might enhance the distribution system's capacity to accommodate interconnection.

In 2015 the Legislature adopted Minn. Stat. § 216B.2425, subdivision 8, which requires distribution studies, as follows:

> Each [public utility that files Biennial Transmission Projects Reports and] that is operating under a multiyear rate plan approved under section 216B.16, subdivision 19, shall conduct a distribution study to identify interconnection points on its distribution system for smallscale distributed generation resources and shall identify necessary distribution upgrades to support the continued development of distributed generation resources, and shall include the study in its [Biennial Transmission Projects Report].

In 2016, Xcel began filing its distribution studies (the filings are commonly referred to as hosting capacity analysis reports, or HCA reports). Under the statute, the study must be conducted biennially, in odd-numbered years, and included in the utility's biennial transmission projects report. However, at parties' request, Xcel agreed to file this study annually, and therefore files its HCA reports separately from its biennial transmission projects reports. The Commission's most recent order was in 2020 (the 2020 HCA Order),[2] which accepted the Company's 2019 HCA report and established additional requirements for the next report.

II. Xcel's 2020 HCA Report

Xcel stated that the two primary statutory objectives for the HCA are to identify available locations for DER interconnection on the distribution system and to identify necessary upgrades to support continued development of distributed generation.

For each annual HCA, Xcel has used the Distribution Resource Integration and Value Estimation (DRIVE) tool, developed by EPRI to conduct its HCA report. Until 2020, DRIVE offered two methodologies to conduct the HCA – the Small Distributed and the Large Centralized. Xcel has used the Large Centralized methodology since 2017. In 2020, EPRI added a new methodology and renamed the initial DRIVE methodologies – dropping the "size" from each, as their use is not defined by the small or large Distributed Energy Resources (DER) size, but the purpose for use, i.e., the Use Case. As a result, the current DRIVE methodologies are: (1) Distributed, which is intended to support a planning use case; (2) Centralized, which supports an interconnection use case; and (3) a new Combined methodology, which supports a combined planning and interconnection use case.

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[1] EPRI, Impact Factors, Methods and Considerations for Calculating and Applying Hosting Capacity, 2018 Technical Update, at v.

[2] *In the Matter of Xcel's 2019 Hosting Capacity Analysis Report*, Docket No. E-002/M-19-685, Order Accepting Report and Setting Further Requirements (July 31, 2020).

Xcel stated that the Centralized method continues to be the most appropriate for its 2020 analysis because the primary Use Case is to aid the interconnection process and advance the long-term goal for integrating HCA with the early steps in the Minnesota Distributed Energy Resources Interconnection Process (MN DIP).

Xcel's 2020 HCA results are shown in a tabular format and as an interactive visual representation, or heat map. The results are a snapshot in time as of August 2020, based on the characteristics and topology of the Company's distribution system at that time. Xcel explained that the hosting capacity for a feeder is a range of values that depends on several variables, including DER location, DER technology, load characteristics, feeder design, and feeder operation. Any addition of new generation on a feeder will reduce the available hosting capacity by an unknown value, impacted predominantly by the location of new DER.

The 2020 HCA results show that 122 feeders have zero maximum hosting capacity. Most of these feeders (97) have at least one megawatt (MW) of existing DER on them. DRIVE considers potential DER in increments of 100 kilowatt (kW) on three-phase sections, which means that if a feeder shows zero hosting capacity, the actual available capacity may be something between zero and 100 kW.

Xcel also stated that the Company worked with stakeholders in June 2020 to gain insight and feedback on the HCA process, tools, methodology, technical assumptions, limiting criteria, and threshold values used in the DRIVE analysis and to discuss factors that warrant a feeder model update.

Xcel further explained that the 2020 HCA presents the discrete hosting capacity of individual feeders without analysis of the cumulative effects of DER additions to substations or the transmission system. As DER penetration increases, system constraints are likely to limit hosting capacity in various geographical areas. For instance, a substation may have three feeders with three MW of available capacity on each, but the substation or transmission systems may not have nine MW of available capacity. As a result, the HCA is not a holistic system view, but rather a snapshot of the capabilities of individual feeders as they are positioned at the time of the analysis.

Although the parties recommended additional requirements for future HCA reports, the Department and ILSR recommended that the Commission accept the 2020 HCA Report, and no party objected to this recommendation. The Commission concurs that the report should be accepted and will do so but will also set forth additional requirements, as discussed below.

III. Compliance with the 2020 HCA Order

As part of its filing in this case, Xcel addressed its compliance with the Commission's 2020 HCA Order, as follows:

- **Ordering paragraph 2**: Filed a compliance filing on August 20, 2020, identifying feeders with actual Daytime Minimum Load data in the 2019 HCA.
- **Ordering paragraph 4**: Organized three Stakeholder Workshops in September 2020 to collaborate with stakeholders in evaluating the costs and benefits associated with future long-term Use Cases for the HCA. Attachment D2 includes summary notes from these Workshops.

- **Ordering paragraph 5**: Addressed integrating the HCA with the MN DIP pre-application and screening processes in future iterations of the HCA at the September 2020 Workshops
- **Ordering paragraph 6**: Included in the heat map pop-up and feeder Tabular Results the following: transformer name, feeder and transformer minimum loading, presence of a Load Tap Changer (LTC) or regulator in the substation, and whether the feeder is network or radial.
- **Ordering paragraph 7**: Filed an Integrated Distribution Plan compliance filing on October 30, 2020, including a discussion of how the HCA can be used to assist state energy policy goals and providing details on how a load hosting analysis would be conducted.
- **Ordering paragraph 8**: Included additional information in the 2020 HCA to provide sufficient information to be a reliable starting point for interconnection applications. For example, sub-feeder Tabular Results list all criteria violations and available hosting capacity by feeder segment and new notes field to the HCA map pop-up and feeder Tabular Results indicate installed voltage supervisory reclosing, constrained feeders and substations, and substations owned by another utility.
- **Ordering paragraph 9**: Addressed the long-term goal of using the HCA in the MN DIP Fast Track screens at the September 2020 Workshops.
- **Ordering paragraph 10**: Included an attachment (Attachment F to the 2020 HCA Report), which includes an analysis of monthly, quarterly, and semiannual HCA updates, including cost estimates.
- **Ordering paragraph 11**: Did not include, due to technical limitations, a unique name or number for each line segment in the HCA map pop-up. Attachment C, sub-feeder Tabular Results, include a unique number for each line segment. Xcel stated that it will continue to explore technical solutions to implement the segment identification in the pop-up in future updates.
- **Ordering paragraph 12**: Stated that showing the actual locations of distribution system lines in the HCA map would compromise grid security, customer privacy, and confidentiality and security. Described these concerns in more detail in Attachment E to the 2020 HCA Report.
- **Ordering paragraph 13**: Prepared a separate tabular report containing sub-feeder results, as Attachment C to the 2020 HCA Report. This spreadsheet is 50MB. The Order required that it be posted on the Company's website or email it if requested. It is posted on the website, but due to its size, it cannot be emailed.
- **Ordering paragraph 14**: Displayed on the heat map pop-up and feeder tabular report whether the DML value displayed is an actual or estimated value and used actual Daytime Minimum Load (DML) values for 894 feeders out of 1,050 feeders.
- **Ordering paragraph 15**: Prepared a separate tabular report for sub-feeder results, which provides all criteria threshold violations and corresponding hosting capacity values for each feeder segment. The heat map continues to display the primary violation only, due to size constraints in the pop-up field.
- **Ordering paragraph 16**: Did not conduct a sensitivity analysis for the 2020 HCA.
- **Ordering paragraph 17**: Will develop a written data validation plan for that Use Case and solicit written feedback from stakeholders when the Commission determines the Use Case for our future HCAs.

- **Ordering paragraph 18**: Provided in Attachment E to the 2020 HCA Report a detailed evaluation of grid security and customer privacy, and confidentiality and security concerns, including discussion on redacting customer energy use data.
- **Ordering paragraphs 21-23**: Implemented the 2020 engagement plan and organized three stakeholder Workshops in June 2020, which included Commission Staff overseeing a discussion between the Company and stakeholders on the technical assumptions, limiting criteria, and thresholds used in the 2020 HCA Report; attachment D1 includes summary notes from these Workshops. The document and the 2020 HCA Report (Attachment A) describe how the feedback was implemented in the 2020 HCA Report.
- **Ordering paragraph 24**: Filed the 2020 HCA Report on November 2, 2020.

The Department recommended that the Commission continue to require Xcel comply with ordering paragraph 8, which requires that "HCA reports be detailed enough to provide developers with a reliable estimate of the available level of hosting capacity at the feeder and sub-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." Xcel did not oppose this recommendation, and the Commission concurs with the Department that it is reasonable to retain this requirement.

In addition to carrying forward the requirements of ordering paragraph 8, the Commission will also require Xcel to fully comply with other ordering paragraphs, including paragraphs 4, 5, 9, 11, 15, and 17 of the 2020 HCA Order.

Regarding ordering paragraphs 11 and 15, some of the parties noted that the availability of the criteria violation information on the online maps varied by feeder. Xcel stated that it had included the information on the tabular spreadsheet but acknowledged that the information was not included on the online map in all instances. Xcel instead included instructions on its hosting capacity webpage on how to access the information. Xcel explained that from a technical perspective, access to this information was constrained in the map pop-up boxes due to the need for additional fields and multiple sub-feeder information. Xcel also stated that there were limitations on providing unique identifiers for each line segment in the online map pop-up box and that due to aggregating certain line segments for security reasons, it was unable to match a specific section identification with the sub-feeder/heat map.

IREC stated that other utilities provide the data Xcel has been directed to make available and that the Company should be required to comply with the requirements for criteria violation data and line segment naming.

The Commission recognizes the need for additional work from Xcel on the feasibility of sharing the data but concurs on the importance of making it available and will therefore direct Xcel to fully comply with the requirements of ordering paragraphs 11 and 15 of the 2020 HCA Order and publish all criteria violation and unique line segment numbers on the map by May 2022.

Because the requirements of ordering paragraphs 4, 5, 9, and 17 of the 2020 HCA Order continue to be relevant going forward, the Commission will also direct Xcel to continue to comply with these requirements.

IV. Load-based HCA

Fresh Energy recommended that Xcel be required to conduct a load-based HCA that includes data and hosting capacity numbers relevant for siting new load DER. According to Fresh Energy, this would support local clean energy deployment and state emissions reduction goals by enabling customers to identify the best locations for installing electric vehicle charging stations, where to target building electrification activities, and how to design load DER projects to maximize their value to the electric grid.

IREC similarly recommended that Xcel conduct such an analysis, stating that a load HCA could provide important insight for the Commission and other stakeholders in examining long-term integrated distribution plans and investments, with the aim to integrate these resources in the lowest-cost manner for the benefit of ratepayers.

The City of Minneapolis also recommended requiring Xcel to conduct a load analysis, stating that an HCA for new load would facilitate a clearer understanding of the best locations for placing new electric vehicle chargers and targeting building electrification activities. In support of its recommendation, the City stated that anticipated new load includes the following:

- Electric Vehicles (EVs): Minneapolis has 2,761 EVs and Plug-in Hybrid EVs of the total 18,749 EVs registered statewide. The number of EVs in Minneapolis has doubled since April 2019, and the City has a goal to electrify its municipal vehicle fleet this decade and supports statewide transportation electrification policies, including the newly approved Clean Cars Minnesota rule.

- Building electrification: Minneapolis greenhouse gas emissions profile shows that emissions from fossil gas is increasing while emissions from electricity is decreasing. The City will not meet its climate goals without electrifying buildings, which includes new heating loads.

Xcel acknowledged that a load HCA could be a useful starting point for evaluating load interconnections, although the individual characteristics of load may require additional analysis prior to interconnection.

The Commission concurs on the value of conducting a load analysis and will therefore require Xcel to do so. To comply with this directive, the Company must perform an HCA load analysis and file the analysis by November 2022.

V. HCA Costs

In response to stakeholder discussion of the cost of data collection and field verification, Xcel proposed two alternative approaches for additional system developments: Path 1 and Path 2. Xcel stated that the proposed paths address issues raised by stakeholders, including: the preference for monthly HCA updates; increased availability and transparency regarding queued projects and necessary system mitigations; reduction of MN DIP timelines; self-service/automated initial review screens; and replacement of initial/supplemental screens with checks against the HCA values. The Company stated that its broader objective is to achieve the

Commission's long-term goal to use the hosting capacity analysis in the interconnection process's fast track screens.

The Company stated that under Path 1, it would work closely with its internal Advanced Data Management Systems (ADMS) team to develop a more refined plan, costs, timeline, and proposal for cost recovery in 2022. The Company estimated that its timeline to complete the Primary System asset data validation is approximately 2-3 years with the potential cost in the range of $27 million–$32 million. Under Path 2, the Company would allow the ADMS effort to proceed as planned and subsequently initiate a further asset data update process to support an HCA/Interconnection Use Case to fill-in where the Primary System data in the Company's Geographic Information System (GIS) is not robust enough to support an interconnection Use Case and gather and validate secondary system asset data to enable further efficiencies for rooftop/smaller DER interconnection.

In response to the Company's proposals, the Department stated that Path 1 provides little insight into how the primary system asset data validation effort is different from its ongoing ADMS primary system asset data validation effort and that it does not fully explain whether the cost estimate is incremental to the ADMS effort. The Department stated that Path 2 similarly gives little insight into what level of effort is needed, if any, to implement the Fast Track Supplemental Review Screen Use Case (FTSRS), nor what its incremental cost would be.

The Department supported a benefit-cost analysis to examine these proposals, stating that distribution system planning should, to the extent practicable, follow the traditional and longstanding principle of cost causation: those who benefit from a utility investment or service should be required to pay their fair share of the investment or service, and as a corollary, those who cause the utility to incur costs in the course of the utility's provision of energy services should be required to pay for those costs.

The Department therefore recommended that Xcel be required to conduct a benefit-cost analysis of the Company's proposed Path 1 and Path 2 improvements of its hosting capacity analysis in any future cost recovery filing. The Department recommended that the analysis identify which improvements are incremental to any existing and planned grid modernization proposals, such as Xcel's ongoing ADMS project and include a discussion of the revenue generated from those who benefit from improvements.

The Department also recommended that the Commission require Xcel to develop a separate proposal to implement the FTSRS Use Case in the next HCA report consistent with the Commission's long-term goal for the HCA and that Xcel conduct a benefit-cost analysis of the FTSRS Use Case.

Finally, the Department recommended that the Commission require Xcel to exclude its HCA costs from its next rate case if the Company requests recovery of its HCA costs through its next Transmission Cost Recovery Rider petition under Minn. Stat. § 216B.16, subd. 7b (b)(4).[3]

[3] Minn. Stat. § 216B.16, subd. 7b (b) (4) allows a utility to recover costs associated with distribution planning required under section 216B.2425, subd. 8, which governs distribution studies.

The Commission concurs with the Department's recommendations regarding a benefit-cost analysis of Plans 1 and 2, as well as of the FTSRS Use Case, and will direct the Company to conduct such analyses. The Commission also concurs with the Department that Xcel's HCA costs be excluded from its next rate case if the Company requests recovery of those costs through its next Transmission Cost Recovery Rider Petition.

VI. Monthly HCA Updates

Stakeholders such as Fresh Energy and the City of Minneapolis supported moving to monthly HCA updates to facilitate access to the most timely and useful hosting capacity information available.

Xcel stated that to move from quarterly to monthly updates, the Company would need to develop and implement automation solutions in several information systems and complete a foundational field data improvement effort to ensure the automation can produce accurate results. According to the Company, moving to monthly updates would require significant resources and could take approximately 3-5 years to complete and would cost approximately $43-$55 million.

The Commission concurs that monthly updates would be valuable but recognizes that the matter requires further analysis. Consequently, the Commission will first require Xcel to provide, in its 2021 HCA Report, options for monthly HCA updates, including cost estimates.

VII. Stakeholder Workshops

As previously directed, Xcel and Commission staff conducted stakeholder outreach on the HCA. The Company held six stakeholder workshops in June and September 2020; summaries of those meetings are included the 2020 HCA Report, Attachment D1 and D2. The Company filed meeting presentations and recordings and also made them available on its hosting capacity webpage.

The Commission recognizes that these workshops have been productive and that continuing such efforts is likely to produce additional insights and helpful recommendations through the process of identifying issues and their possible solutions. The Commission will therefore require additional stakeholder workshops, consistent with the Commission's goals for hosting capacity. The Commission will require such workshops to be held as set forth in the ordering paragraphs below.

ORDER

1. The Commission accepts Xcel's 2020 HCA Report and HCA.

2. For future HCA reports, Xcel must continue to comply with ordering paragraph 8 of the 2020 HCA Order, which reads:
   Xcel's future HCA reports must be detailed enough to provide developers with a reliable estimate of the available level of hosting capacity at the feeder and sub-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 must fully comply with the requirements of ordering paragraphs 11 and 15 of the 2020 HCA Order and publish all criteria violation and unique line segment numbers on the map by May 2022.

4. Xcel must perform an HCA for load and file the analysis by November 2022.

5. The Commission directs that stakeholder workshops be held that provide for proposals put forward by stakeholders to incorporate the HCA into the interconnection process; the workshops will be convened by the Distributed Generation Work Group and facilitated by Commission staff. The Commission delegates administrative authority to the Executive Secretary to set schedules and timelines. Xcel shall, in collaboration with stakeholders, identify which priorities should be addressed first. For the priorities, stakeholders shall discuss the costs and benefits. Once complete, Xcel shall use the resulting information to develop a cost-benefit analysis and timelines for the priorities. The Company shall provide this information within 120 days after the workshops conclude, or in the alternative, a status update and revised timeline for providing this timeline.

6. Xcel must conduct a benefit-cost analysis of the Company's proposed Path 1 and Path 2 improvements of its hosting capacity analysis in any future cost recovery filing. This analysis should clearly indicate which improvements are incremental to any existing and planned grid modernization proposals, such as Xcel's ongoing Advanced Distribution System Management project. Additionally, this analysis should include a discussion of revenue generation from beneficiaries of any improvements.

7. Xcel must exclude its hosting capacity analysis costs from its next rate case if the Company requests recovery of its HCA costs through its next Transmission Cost Recovery Rider Petition.

8. Xcel must separately develop a proposal to implement the Fast Track Supplemental Review Screen (FTSRS) Use Case in the next hosting capacity analysis report consistent with the Commission's long-term goal of the hosting capacity analysis and must conduct a benefit-cost analysis of the FTSRS Use Case.

9. Xcel must develop, following a Commission determination of the Use Case for future HCA reports, a corresponding data validation plan for HCA results, solicit written feedback from stakeholders on the draft plan, and then include the final plan in the next HCA report. (2020 HCA Order, ordering paragraph 17).

10. Xcel must collaborate with stakeholders in evaluating the costs and benefits associated with a hosting capacity analysis able to achieve the following objectives (2020 HCA Order, ordering paragraph 4):

    a. remaining an early indicator of possible locations for interconnection;
    b. replacing or augmenting initial review screens and/or supplemental review in the interconnection process; and/or
    c. automating interconnection studies.

11. Xcel must continue working with stakeholders to identify opportunities to integrate the HCA and the MN DIP pre-application and screening processes in future iterations of the HCA. (2020 HCA Order, ordering paragraph 5).

12. The Commission adopts a long-term goal to use the hosting capacity analysis in the interconnection process's fast track screens. Xcel should work with stakeholders to refine the hosting capacity analysis. Xcel may seek cost and timing clarification from the Commission. (2020 HCA Order, ordering paragraph 9).

13. Xcel must provide, in its 2021 HCA Report, options for monthly HCA updates, including cost estimates.

14. This order shall become effective immediately.

BY ORDER OF THE COMMISSION

Will Seuffert
Executive Secretary

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CERTIFICATE OF SERVICE

I, Chrishna Beard, hereby certify that I have this day, served a true and correct copy of the following document to all persons at the addresses indicated below or on the attached list by electronic filing, electronic mail, courier, interoffice mail or by depositing the same enveloped with postage paid in the United States mail at St. Paul, Minnesota.

Minnesota Public Utilities Commission
ORDER ACCEPTING REPORT, REQUIRING STAKEHOLDER WORKSHOPS, AND SETTING ADDITIONAL REQUIREMENTS

Docket Number **E-002/M-20-812**
Dated this 9th day of November, 2021

/s/ Chrishna Beard

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Roxanne	Achman	rachman@co.benton.mn.us		531 Dewey Street Foley, MN 56329	Electronic Service	No	OFF_SL_20-812_Official Service List
Alison C	Archer	aarcher@misoenergy.org	MISO	2985 Ames Crossing Rd Eagan, MN 55121	Electronic Service	No	OFF_SL_20-812_Official Service List
James J.	Bertrand	james.bertrand@stinson.com	STINSON LLP	50 S 6th St Ste 2600 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
James	Canaday	james.canaday@ag.state.mn.us	Office of the Attorney General-RUD	Suite 1400 445 Minnesota St. St. Paul, MN 55101	Electronic Service	No	OFF_SL_20-812_Official Service List
John	Coffman	john@johncoffman.net	AARP	871 Tuxedo Blvd. St, Louis, MO 63119-2044	Electronic Service	No	OFF_SL_20-812_Official Service List
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_20-812_Official Service List
Riley	Conlin	riley.conlin@stoel.com	Stoel Rives LLP	33 S. 6th Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
Brooke	Cooper	bcooper@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022191	Electronic Service	No	OFF_SL_20-812_Official Service List
George	Crocker	gwillc@nawo.org	North American Water Office	PO Box 174 Lake Elmo, MN 55042	Electronic Service	No	OFF_SL_20-812_Official Service List
John	Farrell	jfarrell@ilsr.org	Institute for Local Self-Reliance	2720 E. 22nd St Institute for Local Self-Reliance Minneapolis, MN 55406	Electronic Service	No	OFF_SL_20-812_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280 Saint Paul, MN 551012198	Electronic Service	No	OFF_SL_20-812_Official Service List
Edward	Garvey	edward.garvey@AESLconsulting.com	AESL Consulting	32 Lawton St Saint Paul, MN 55102-2617	Electronic Service	No	OFF_SL_20-812_Official Service List
Janet	Gonzalez	Janet.gonzalez@state.mn.us	Public Utilities Commission	Suite 350 121 7th Place East St. Paul, MN 55101	Electronic Service	No	OFF_SL_20-812_Official Service List
Kim	Havey	kim.havey@minneapolismn.gov	City of Minneapolis	350 South 5th Street, Suite 315M Minneapolis, MN 55415	Electronic Service	No	OFF_SL_20-812_Official Service List
Adam	Heinen	aheinen@dakotaelectric.com	Dakota Electric Association	4300 220th St W Farmington, MN 55024	Electronic Service	No	OFF_SL_20-812_Official Service List
Michael	Hoppe	lu23@ibew23.org	Local Union 23, I.B.E.W.	445 Etna Street Ste. 61 St. Paul, MN 55106	Electronic Service	No	OFF_SL_20-812_Official Service List
Alan	Jenkins	aj@jenkinsatlaw.com	Jenkins at Law	2950 Yellowtail Ave. Marathon, FL 33050	Electronic Service	No	OFF_SL_20-812_Official Service List
Richard	Johnson	Rick.Johnson@lawmoss.com	Moss & Barnett	150 S. 5th Street Suite 1200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
Sarah	Johnson Phillips	sarah.phillips@stoel.com	Stoel Rives LLP	33 South Sixth Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
Thomas	Koehler	TGK@IBEW160.org	Local Union #160, IBEW	2909 Anthony Ln St Anthony Village, MN 55418-3238	Electronic Service	No	OFF_SL_20-812_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Peder	Larson	plarson@larkinhoffman.com	Larkin Hoffman Daly & Lindgren, Ltd.	8300 Norman Center Drive Suite 1000 Bloomington, MN 55437	Electronic Service	No	OFF_SL_20-812_Official Service List
Kavita	Maini	kmaini@wi.rr.com	KM Energy Consulting, LLC	961 N Lost Woods Rd Oconomowoc, WI 53066	Electronic Service	No	OFF_SL_20-812_Official Service List
Pam	Marshall	pam@energycents.org	Energy CENTS Coalition	823 7th St E St. Paul, MN 55106	Electronic Service	No	OFF_SL_20-812_Official Service List
Maria	McCoy	maria@ilsr.org	Institute for Local Self-Reliance	2720 E 22nd St. Minneapolis, MN 55406	Electronic Service	No	OFF_SL_20-812_Official Service List
Joseph	Meyer	joseph.meyer@ag.state.mn.us	Office of the Attorney General-RUD	Bremer Tower, Suite 1400 445 Minnesota Street St Paul, MN 55101-2131	Electronic Service	No	OFF_SL_20-812_Official Service List
Stacy	Miller	stacy.miller@minneapolismn.gov	City of Minneapolis	350 S. 5th Street Room M 301 Minneapolis, MN 55415	Electronic Service	No	OFF_SL_20-812_Official Service List
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	OFF_SL_20-812_Official Service List
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
David	Niles	david.niles@avantenergy.com	Minnesota Municipal Power Agency	220 South Sixth Street Suite 1300 Minneapolis, Minnesota 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
Carol A.	Overland	overland@legalectric.org	Legalectric - Overland Law Office	1110 West Avenue Red Wing, MN 55066	Electronic Service	No	OFF_SL_20-812_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	Yes	OFF_SL_20-812_Official Service List
Kevin	Reuther	kreuther@mncenter.org	MN Center for Environmental Advocacy	26 E Exchange St, Ste 206 St. Paul, MN 551011667	Electronic Service	No	OFF_SL_20-812_Official Service List
Isabel	Ricker	ricker@fresh-energy.org	Fresh Energy	408 Saint Peter Street Suite 220 Saint Paul, MN 55102	Electronic Service	No	OFF_SL_20-812_Official Service List
Richard	Savelkoul	rsavelkoul@martinsquires.com	Martin & Squires, P.A.	332 Minnesota Street Ste W2750 St. Paul, MN 55101	Electronic Service	No	OFF_SL_20-812_Official Service List
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul, MN 55101	Electronic Service	Yes	OFF_SL_20-812_Official Service List
Bria	Shea	bria.e.shea@xcelenergy.com	Xcel Energy	414 Nicollet Mall Minneapolis, MN 55401	Electronic Service	No	OFF_SL_20-812_Official Service List
Ken	Smith	ken.smith@districtenergy.com	District Energy St. Paul Inc.	76 W Kellogg Blvd St. Paul, MN 55102	Electronic Service	No	OFF_SL_20-812_Official Service List
Sky	Stanfield	stanfield@smwlaw.com	Shute, Mihaly & Weinberger	396 Hayes Street San Francisco, CA 94102	Electronic Service	No	OFF_SL_20-812_Official Service List
Byron E.	Starns	byron.starns@stinson.com	STINSON LLP	50 S 6th St Ste 2600 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
James M	Strommen	jstrommen@kennedy-graven.com	Kennedy & Graven, Chartered	150 S 5th St Ste 700 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	OFF_SL_20-812_Official Service List
Lynnette	Sweet	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	Yes	OFF_SL_20-812_Official Service List
Thomas	Tynes	jjazynka@energyfreedomcoalition.com	Energy Freedom Coalition of America	101 Constitution Ave NW Ste 525 East Washington, DC 20001	Electronic Service	No	OFF_SL_20-812_Official Service List
Lisa	Veith	lisa.veith@ci.stpaul.mn.us	City of St. Paul	400 City Hall and Courthouse 15 West Kellogg Blvd. St. Paul, MN 55102	Electronic Service	No	OFF_SL_20-812_Official Service List
Joseph	Windler	jwindler@winthrop.com	Winthrop & Weinstine	225 South Sixth Street, Suite 3500 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List
Yochi	Zakai	yzakai@smwlaw.com	SHUTE, MIHALY & WEINBERGER LLP	396 Hayes Street San Francisco, CA 94102	Electronic Service	No	OFF_SL_20-812_Official Service List
Patrick	Zomer	Pat.Zomer@lawmoss.com	Moss & Barnett a Professional Association	150 S. 5th Street, #1200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-812_Official Service List