


Staff Briefing Papers

Meeting Date	September 30, 2021	Agenda Item 4**
Company	Northern States Power Company d/b/a Xcel Energy	
Docket No.	E002/M-20-812	
	In the Matter of the Xcel Energy 2020 Hosting Capacity Report Under Minn. Stat. §216B.2425, Subd. 8	
Issues	Should the Commission accept or take some other action on Xcel Energy's 2020 Hosting Capacity Analysis Report?	
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 Relevant Documents	Date
*Commission - Order Accepting Report and Setting ...Requirements	July 31, 2020
Xcel Energy – 2020 Hosting Capacity Report Filing and Att. B, C1-5	November 2, 2020
ISLR – Comments	April 7, 2021
DOC DER – Comments	April 7, 2021
IREC – Comments	April 7, 2021
City of Minneapolis – Reply Comments	May 10, 2021
Fresh Energy – Reply Comments (Developer Letters, 20-800)	May 21, 24, 2021
Xcel Energy – Reply Comments	May 21, 2021
*Xcel Energy – Supplemental Reply	June 4, 2021
DOC DER – Reply/Supplemental Comments	July 26, 2021
Xcel Energy – Supplemental Information	August 4, 2021

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The attached materials are work papers of the Commission Staff. They are intended for use by the Public Utilities Commission and are based upon information already in the record unless noted otherwise.

I. Statement of the Issues

Should the Commission accept or take some other action on Xcel Energy's (Xcel) 2020 Hosting Capacity Analysis Report?

II. Overview

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 impacting power quality or reliability under existing control configurations and without requiring infrastructure upgrades.”¹ Xcel Energy has worked with EPRI since 2015 in the development of the Distribution Resource Integration and Value Estimation (DRIVE) tool used for the Company's hosting capacity analysis which identifies minimum and maximum hosting capacity for feeders.

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 to identify interconnection points on its distribution system for small-scale distributed generation resources and shall identify necessary distribution upgrades to support the continued development of distributed generation resources... .”

Under the statute, the study must be conducted biennially (odd-numbered years) and included in the utility's biennial transmission projects report. Xcel has agreed to conduct and file the study annually. Xcel files the Hosting Capacity Analysis (HCA) Report on the same due date as the biennial report (November 1) however, it is filed as a stand-alone report from the biennial transmission projects report, as authorized by the Commission in the 2018 HCA Order).²

Report Year (Filing Year)	Docket No.	Initial Filing (Filing Link)	PUC Order Date (Order Link)
2020	E002/M-20-812	2020 HCA Report	-
2019	E002/M-19-685	2019 HCA Report	2020 HCA Order - July 31, 2020
2018	E002/M-18-684	2018 HCA Report	2019 HCA Order - August 1, 2019
2017	E002/M-17-777	2017 HCA Report	2018 HCA Order - July 19, 2018
2015	E002/M-15-962	2016 HCA Report	2017 HCA Order - August 1, 2017

III. Background

On July 31, 2020, the Commission issued its Order Accepting Study [2019 HCA Report] and Setting Further Requirements in Docket No. E002/M-19-685 (2020 HCA Order).³

¹ EPRI, Impact Factors, Methods and Considerations for Calculating and Applying Hosting Capacity, 2018 Tech. Update, p. v

² See Order Point 8, [July 19, 2018](#) Order Accepting Study and Setting Further Filing Requirements.

³ Xcel Energy, 2020 HCA Report filing includes Att. A – 2020 HCA Report; Att. B – 2020 Tabular HCA Results by Feeder spreadsheet (public and trade secret versions); Att. C – 2020 Tabular HCA Results of Criteria Threshold Violations by

On November 1, 2020, Xcel filed the 2020 Hosting Capacity Report (2020 HCA Report). The 2020 HCA Report identifies a publicly available website displaying Xcel Energy's hosting capacity map⁴ and a spreadsheet of HCA for 1,050 feeders in the Company's Minnesota service territory. For the second year, the Company has provided peak load data for substation transformers and feeders. The Company treats this information as Protected Data. As such, Xcel provides a public and trade secret version of the spreadsheet and omits the protected data on the web-based map.

At the request of parties, the Commission authorized comment period extensions to both the initial and reply periods.

On April 7, 2021, the Department of Commerce – Division of Energy Resources (Department), the Institute for Local Self-Reliance (ISLR), and the Interstate Renewable Energy Council Inc. (IREC) filed initial comments.

By May 21, 2021, Xcel, City of Minneapolis, and Fresh Energy filed reply comments.

On May 24, 2021, Fresh Energy, on behalf of several solar developers, filed copies of comments filed in the Commission's Investigation on Grid and Customer Security Issues Related to Public Display or Access to Electronic Distribution Grid Data in Docket No. E999/CI-20-800 (Customer and Grid Security Investigation).

On June 4, 2021, Xcel filed supplemental reply comments that included additional information omitted from their reply.

On July 26, 2021, the Department filed supplemental comments and on August 4, 2021, Xcel filed a letter noting it had for the first time, updated its online HCA information quarterly and would do so moving forward.

IV. Commission Action

Commission action on Xcel Energy's HCA Report is not required by law. Given stakeholder interest and the iterative nature of the HCA to-date, the Commission historically has accepted the HCA Report filings upon review and provided additional guidance as warranted. Typically, whether the Commission accepts a given HCA report and/or provides guidance for future filings stems from the analysis of whether: Xcel complied with law (statutory requirements), Xcel complied with previous Commission orders, and the record indicates that additional or new guidance should be provided to Xcel to ensure future reports are useful and progressively improving.

Feeder Segment; Att. D1/D2 – Summaries of Workshop Presentations; Att. E - Security and Confidentiality Considerations; Att. F – Roadmap for Integrating the HCA with the DER Interconnection Process and Analysis of Future Use Cases, and Att. G – Compliance Matrix.

⁴ https://www.xcelenergy.com/hosting_capacity_map

V. Summary of the 2020 HCA Report (Overview)

As with prior HCA reports, Xcel continues to rely on EPRI's Distributed Resource Integration and Value Estimation (DRIVE) tool. The tool uses distribution system model inputs to analyze the capacity of distributed energy resources (DER) able to be accommodated at a location and determine when a set of potential issues might limit hosting capacity or require mitigation.

Xcel Energy asserts the 2020 HCA Report addresses and acts on the Commission's 2020 HCA Order; further, the Company "believes the 2020 HCA is a meaningful tool to assist in identifying available locations and constraints for DER interconnection."⁵ The Company provides a compliance matrix itemizing the Order points and corresponding location in the HCA Report filing where each requirement is addressed.⁶ Over the five annual iterations of Xcel Energy's hosting capacity analysis, the Company argued: "[o]ur methodology, data collection, presentation of results, and the DRIVE tool have evolved each year, improving the quality and usefulness of the HCA Report."⁷

HCA Use Cases or Purpose

Xcel Energy maintains the HCA is one of several tools available to customers and developers to determine the viability of a potential DER site. Other tools include: the public DER queue, a pre-application report; review of a DER interconnection application; and, if needed, the detailed cost estimate for system upgrades provided at the time of the interconnection agreement.⁸

The Commission has not explicitly indicated a use case that Xcel should pursue, but did provide direction as to intended objectives of the HCA noted in the Commission's 2020 HCA Order and required: "Xcel shall collaborate with stakeholders in evaluating the costs and benefits associated with a hosting capacity analysis able to achieve the following objectives:

- 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;
- c. and/or automating interconnection studies."⁹

Further, the Commission required Xcel to work with stakeholders to identify opportunities to integrate the HCA and the statewide interconnection standards (Minnesota DER Interconnection Process or MN DIP), as well as the long term goal of using the HCA in the in the MN DIP Fast Track Screens.¹⁰

⁵ Xcel Energy, HCA filing, p. 28

⁶ Id. Att. G.

⁷ Id. Att. A, p.1

⁸ Id. pp. 10-11

⁹ Commission 2020 HCA Order, p. 14

¹⁰ Id., p. 14

Notably, the 2020 HCA Report includes information on work Xcel conducted on increasing the frequency of the HCA, analysis of potential future uses of the HCA in the interconnection process, work conducted with EPRI on a roadmap to transition to potential HCA futures and anticipated costs to pursue four use cases.^{11,12} Xcel noted the timelines associated with the HCA futures may need adjustment depending on, “the direction the Commission provides, a detailed design process, and resolution of cost recovery for the changes.”¹³ Xcel also noted that to inform its use case analysis it: 1) conducted several workshops to gain insights from stakeholders, 2) engaged EPRI to provide industry insights and develop a plan to evolve the HCA, and 3) evaluated internal processes to determine implications, cost and timing needed to meet the Commission’s long-term goal (to use the HCA in the interconnection process and MN DIP Fast Track Screens).¹⁴

After comment from parties, in reply, Xcel proposed two alternative paths, Path 1 and Path 2, that it proposed may offer a compromise and achieve some of the nearer term objectives of stakeholders in a timelier manner (namely, monthly HCA updates).¹⁵

2020 Changes or Updates

In November 2020, Xcel has also added to its hosting capacity website information on ‘Known Capacity Constraints’. Xcel noted that this information is different than hosting capacity results, as it based solely on thermal capacity and DER penetrations that are updated monthly; Xcel also petitioned and received approval from the Commission in Docket E002/M-13-867 to allow publicly posting additional information on community solar garden in the interconnection queue in order to provide additional information to developers who are searching for suitable interconnection locations.¹⁶

Further, the Company recognizes DRIVE allows for other types of load hosting analysis (e.g. electric vehicle charging stations or beneficial electrification), but continues to argue that such analysis is better suited for the integrated distribution plan (IDP) rather than this HCA, and per the 2020 HCA Order, Xcel filed a compliance filing on this topic in the 2020 Integrated Distribution Plan docket (E002/M-19-666).^{17,18} This topic is further discussed below.

Last, Xcel provided its analysis where it updated or changed DRIVE inputs or methodologies. Any that are of note or contested are discussed in the discussion below.^{19,20}

¹¹ Id., Att F

¹² 1- The HCA remains an early indicator for interconnection; 2- Integrate the HCA with the MN DIP Pre-Application Data Report; 3- The HCA integrates with MN DIP to replace or augment the Fast Track Initial or Supplemental Screens; 4- The HCA integrates with MN DIP to automate the interconnection studies more broadly. (Table from HCA, p. 22)

¹³ Id. p. 2

¹⁴ Id. Att. F, p. 1

¹⁵ Xcel Reply, pp. 7-12

¹⁶ Id. p. 11; this request was authorized by the Commission on February 23, 2021; See Doc. ID. [20212-171238-01](#)

¹⁷ Id. p.8

¹⁸ Xcel – Compliance Filing, October 30, 2020, p. 25-37; See Doc. ID: [202010-167865-01](#)

¹⁹ Id. pp. 6-7

²⁰ Xcel noted while it uses a 98% power factor in its current HCA, it will review use of 95% power factor (as used in the

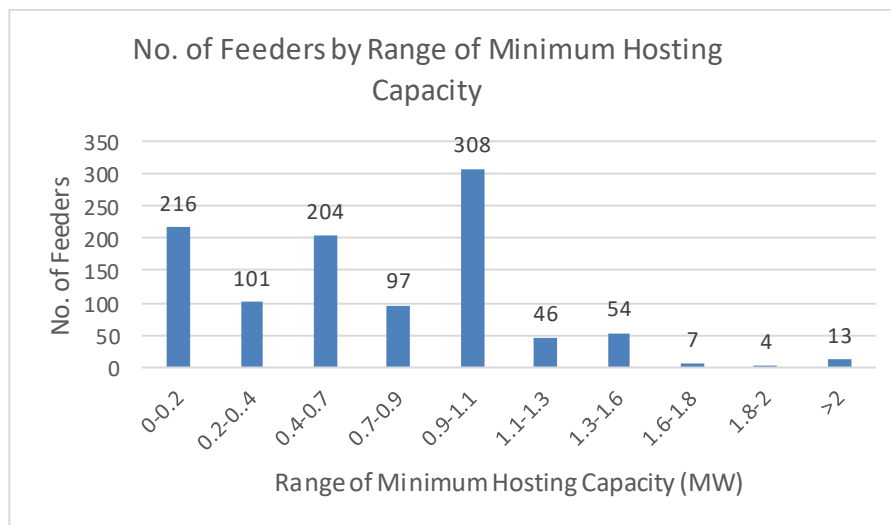
2020 HCA Results

Xcel cautions that the HCA is a “snapshot in time” (in this report, August 2020), and hosting capacity is a range of values for individual feeders that depends on a number of variables not necessarily captured in the HCA. These include DER location, DER technology, load characteristics, feeder design and operation, system mitigations (increasing hosting capacity) and cumulative effects on substations or the transmission system (decreasing hosting capacity). Results are displayed in a publicly available heat map and by feeder and feeder segment in spreadsheet format.²¹

The 2020 HCA found 122 feeders have zero maximum hosting capacity – down from the 129 feeders in the 2019 HCA. Xcel notes 97 of these feeders have at least 1 MW of existing DER installed.²² Additionally, in the now quarterly update, Xcel’s August 4, 2021 HCA Quarterly Update (Q3 Update) found 95 feeders that have zero maximum hosting capacity, with 76 having at least 1 MW of DER.²³

Staff provides charts of the number of feeders within a MW range for both minimum and maximum hosting capacity in the November 2020 Report; however, note a feeder’s hosting capacity may be limited by the substation transformer’s hosting capacity limit.

Minimum Hosting Capacity: The maximum amount of DER that can be accommodated anywhere on the feeder. Most often at the end of the feeder.



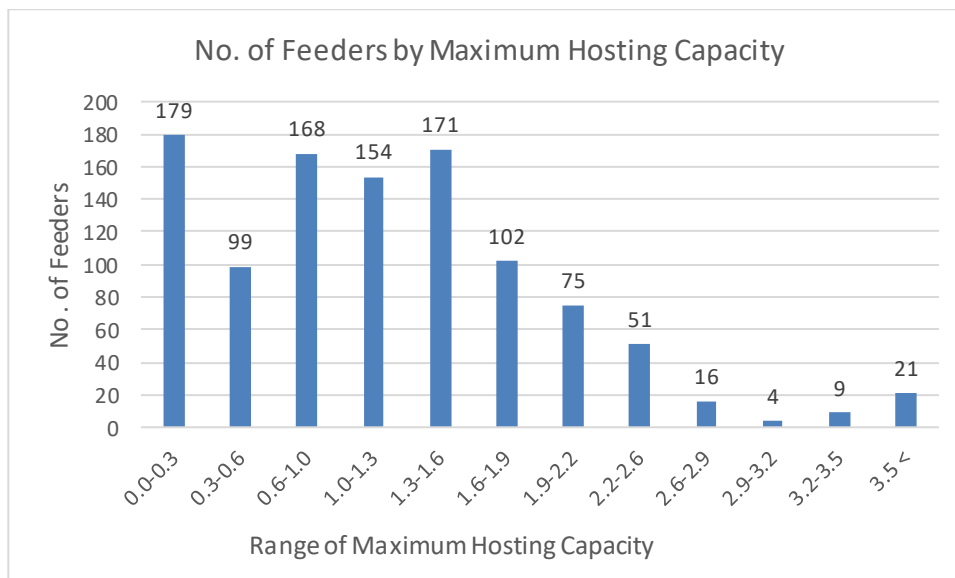
interconnection process) in the 2021 report. p.13

²¹ Id. Att. B

²² Id. p. 10

²³ Xcel Supplemental Comments, August 4, 2021, p.2; staff notes that Xcel did not explain in its quarterly update the reason for the decrease in feeders with at least 1 MW of DER. Commissioners may want to ask Xcel to explain the decrease.

Maximum Hosting Capacity: The maximum amount of DER that can be accommodated at a single point on the feeder. Most often closer to the substation.



VI. Parties' Positions

Staff provides a high level overview of parties positions in this sections, and discusses issue by issue topics (including party positions) later in this paper.

City of Minneapolis: The City of Minneapolis provided reply comments that supported the continued preparation of the HCA Report and associated data. The City of Minneapolis discussed electric vehicle penetration in its region and its goals to electrify its municipal fleet this decade; the City of Minneapolis recommended the Commission require Xcel to perform an HCA for new loads (similar to the way it does for solar siting today) to prepare for EV integration.

Additionally, the City of Minneapolis encouraged: 1) the publication of criteria violation results, 2) an increase in the frequency of reporting and updating of HCA data (move to monthly), 3) field data verification cost justification, and further Commission staff facilitated stakeholder working groups. These issues are discussed in more detail below within each topic area.

Department of Commerce: The Department ultimately recommended acceptance of the 2020 HCA Report with conditions regarding: 1) cost tracking and recovery mechanisms for HCA-related Xcel system enhancements, 2) requirements to conduct a cost-benefit analysis for Xcel's proposed Path 1 and Path 2 future HCA uses, and 3) a requirement for Xcel to develop a Fast Track Review Supplemental Review Screen use case proposal and cost-benefit assessment of the proposal in its 2021 HCA Report.

Fresh Energy: Fresh Energy focused on four main issues: 1) the needs for the HCA to be updated monthly to make the report more useful to developers; 2) the importance of Xcel providing detailed

criteria violation information (both online and in spreadsheet form) beginning November 1, 2021; 3) reasons why Xcel should be required to conduct a load-based DER hosting capacity analysis (preparing for EVs and beneficial electrification and to assist in meeting state climate objectives);²⁴ and, 4) support for a Commission staff facilitated working group on HCA and interconnection process integration.

Institute for Local Self-Reliance: ILSR ultimately recommended the Commission should accept the 2020 HCA Report but made several specific recommendations to improve the hosting capacity report and require specific deadlines for action. More generally, ILSR noted its concern that Xcel is slowing the adoption of cost-effective distributed generation and undervaluing a robust HCA by under-projecting the likely future distributed solar (citing to Xcel's latest IRP and Xcel's project DER growth as compared to national averages and projections).²⁵

ILSR also argued that HCA could play an important part in resolving interconnection queue delays that were the subject of recent Commission-imposed fines on Xcel. Like other commentors, ILSR noted the need to further discussion on grid and customer privacy and security in Docket E999/CI-20-800.

Last, ILSR encouraged the Commission to require Xcel to move on HCA integration into the MN DIP – requiring a specific date by which Xcel shall have it implemented; ILSR supports having a Commission staff facilitate a work group on this topic.

Interstate Renewable Energy Council: IREC provided comments and made several recommendations. First, IREC noted that Xcel's 2020 HCA "represents a substantial improvement from its earlier HCAs. These improvements are directly attributable to the Commission's [2020 HCA Order] which directed Xcel to use and publish specific data in the HCA."²⁶

IREC make several arguments (further discussed below) that: the HCA needs to be updated monthly, Xcel's filing doesn't support the scope or cost estimated Xcel claims is needed to field verify data in order to move to a monthly update, Xcel should be required to conduct an HCA using monthly load data (to provide data to develop products that avoid seasonal constraints), Xcel should publish all criteria violations and unique line segment numbers within 30 days, Xcel shall file its standard feeder names in the sub-feeder level results, and it is premature to determine specific proposals for the integration of the HCA into the interconnection process in this proceeding.

²⁴ Fresh Energy Reply, pp. 2-3

²⁵ ILSR Initial, pp. 1-3; Xcel projects 1,778 MW of distributed solar in 2034 whereas ILSR's forecast shows 4,256 MW for the same year.

²⁶ IREC Initial, p. 24

VII. Issues Discussion and Staff Analysis

Below staff reviews Xcel's compliance with law, compliance with previous order points, and new issues raised by stakeholders. Staff has segmented out two more broad categories of issues for further in-depth discussion:

1. Compliance with Law and HCA Report Acceptance or Rejection
2. Ordering Point Issue Evaluation
3. Public Facing Map Order Requirements
4. Frequency of HCA Updates, Use Cases, Cost, Data Validation Needs, and MN DIP Integration
5. Further Stakeholder Work
6. Load Hosting Capacity
7. Additional Requests from IREC

1. Compliance with Law and HCA Report Acceptance or Rejection

Xcel Energy requests the Commission accept the 2019 HCA Report. (**Decision Option 1**)

No party suggests rejection. The Department notes that Minn. Stat. § 216B.2425, subd. 8, has a substantive requirement (to conduct a study) and a procedural requirement (to include the study in its report). The Department then says that the 1,050 feeders including the 115 excluded from the "heat map" are "a reasonable and sufficient amount of interconnection points on the Xcel distribution system" and render the 2020 HCA "complete" as far as the substantive requirement of the Statute is concerned."²⁷

As mentioned earlier, several parties request compliance filings be required as part of the 2020-2021 HCAs and they are discussed throughout the analysis. The HCA Report can be accepted with any combination of, or none of, the conditions. Staff notes no action on the 2020 HCA Report is required, but the Commission has accepted the past four HCA Report iterations and provided additional guidance by order.

*Staff recommends that the Commission accept the report as filed (**Decision Option 1**) and consider whether additional conditions, as discussed below, are warranted.*

2. Ordering Point Issue Evaluation

In this section staff reviews several order points, Xcel's compliance with those Commission Ordering Points and whether parties agree or proposed modification. Several larger contested issues are discussed in following sections, below (Future Stakeholder Work, Use Case and Cost Recovery, etc.)

²⁷ Department Initial, p. 5

- **Order Point 2 – 30 Day Compliance Filing on Daytime Minimum Load (DTML) averages versus actuals.**

Xcel provided this information in a compliance filing dated August 20, 2020 in Docket No. E002/M-19-685. Xcel is required by law to file its next report on November 1, 2021, so no ordering point requiring filing of the next report is necessary.

- **Order Point 8 – HCA as Useful Starting Point for Developers** - HCA must be detailed enough to provide developers with a reliable estimate of the hosting capacity at the feeder and sub-feeder levels

The Department recommends that the Commission continue to include 2020 HCA Order Point 8 (an order point that has been carried forward by the Commission for three years) 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 levels 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 Department notes it is unclear whether the HCA is a useful starting point for developers as previous reviews and comments indicate the usefulness may still be limited. The Department caveated that the Order Point only requires a 'reasonable estimate' and finds that Xcel has complied with this order point.²⁸ **(Decision Option 2)**

*Staff agrees and recommends **Decision Option 2.***

- **Order Point 11: Line Segment Naming Convention** - Include a unique name or number for each line segment in online map pop-up boxes and **Order Point 15: Criteria Violation Tiering Data** - Include criteria violations and corresponding hosting capacity values for each HCA model run and location, and map with any necessary caveats

Order Points 11 and 15 are grouped for discussion purposes below as some parties made joint recommendations on these items.

Xcel noted limitations on providing unique identifiers for each line segment in the online map pop-up box; Xcel appreciated the Department's conclusion that Xcel's explanation was reasonable about aggregating certain line segments for security reasons and due to the aggregation, Xcel is unable to match a specific Section ID with the sub-feeder/heat map.²⁹

²⁸ Department Initial, p. 7

²⁹ Xcel Reply, p. 26

Order Point 11 on line segment naming, an issue that will be discussed and evaluated in Commission Docket E999/CI-20-800, is not further explored here, and staff does not make a recommendation in this docket.

Parties noted that the availability of the criteria violation information on the online map was varied by feeder. Xcel noted it complied with the requirement to provide the data, which it did on the tabular spreadsheet. However, Xcel acknowledged that the information was not included on the online map in all instances. Xcel instead provided instructions on its hosting capacity webpage on how to access the information. Xcel noted from a technical perspective, the inclusion of this information was constrained in the map pop-up boxes as it would require additional fields and each location may need multiple sub-feeder information.³⁰

IREC provided robust comments on both topics, criteria violation inclusion and line segment naming, noting that “multiple other utilities present this data – plus much more – on their HCA maps without problems.” IREC provided two examples of utilities who already provide the same data, and more, on their pop-up information boxes on their online maps (NV Energy and Southern California Edison).³¹ IREC argued that Xcel did not meet the requirements in Order Points 11 or 15 and asks that the Commission require Xcel to publish this information on their map within 30 days.

There are three stakeholder decision options available for this item (and a staff proposed option (**Decision Option 4-staff modified**, further below)). Stakeholder decision options:

- **(Decision Option 3)** Xcel shall fully comply with OP 11 and OP 15 requirements to publish all criteria violation and unique line segment numbers on the map within 30 days. (City, IREC, ILSR)
- **(Decision Option 4)** Xcel shall fully comply with OP 11 and OP 15 requirements to publish all criteria violation and unique line segment numbers on the map by November 1, 2021. (Fresh Energy)
- **(Decision Option 12)** Xcel shall use standard feeder names in the sub-feeder results within 30 days and in all future reports.

Staff finds the criteria violation issue largely relating to limitations of Xcel’s website and the trade-offs between ease of access for developers and Xcel investigating additional solutions to provide this information in a pop-up box on their online map.

As parties have shown examples of other utilities that provide this level of information in an interactive method on their online map, it seems publishing the criteria violation information is a reasonable ask of Xcel. Additionally, while solutions may need to be developed in order to display this information, it is a request of almost all parties. Last, when ordered in past HCA Orders, Xcel has been able to ensure solutions to improving online map data are found.

³⁰ Xcel Reply, p. 25

³¹ IREC Initial, pp. 13-15

Staff has concern that 30 days, or even November 21, 2021, may be too short to require Xcel to make the software modifications it outlines in its 2020 HCA Report. Xcel is now updating their HCA quarterly and staff suggests the Commission asking Xcel if June 1 (or the Q3 2022 HCA iteration) would be manageable to update their online maps to include this information.

It is staffs' understanding that the issue related to the use of standard feeder names (**Decision Option 12**) has been rectified by Xcel and will continue to be moving forward and Decision Option 12 is not needed at this time.³²

Staff recommends the Commission seek input from Xcel at the agenda meeting on a reasonable deadline to implement the criteria violation information on its online map, and ensure it is no later than with Q3 2022 updates. Upon selecting a date, the Commission should move a modified decision option that allows Order Point 11 to be addressed in the Customer and Grid Security Investigation (Docket #20-800): **(Decision Option 4-staff modified)**

Xcel shall fully comply with ~~OP 11 and~~ OP 15 requirements to publish all criteria violations ~~and unique line segment numbers~~ on the map by _____ ~~November 1, 2021~~.

- **Order Point 13: Sub-Feeder Data Availability** - Make available sub-feeder HCA results in the annual report, hosting capacity webpage or by email request.

Xcel provided sub-feeder results in Attachment C of the 2020 Report and the data can be exported from its website in xlsx. format. Due to the size of the spreadsheet (50 MB), the Company is technically unable to provide the spreadsheet via e-mail. The Department found the information was filed and concluded that Xcel complied with Order Point No. 13.³³

Staff agrees and no action is necessary.

- **Order Point 14: DTML Data in 2020 Report** - Include number of feeders with actual vs. estimate daytime minimum load (DTML) data on tabular spreadsheet [in 2020 Report] and make a 30-day compliance filing with information on the 2019 HCA Report DTML data

The Department reviewed the Tabular Report and Xcel's public-facing map and determined that this information is present. The Department concluded that Xcel complied with Order Point No. 14.³⁴

Staff agrees, no Commission action is necessary.

³² Xcel Reply, p. 25 – information updated by May 2021.

³³ Department Initial, p. 8

³⁴ Department initial, p. 9

- **Order Point 17: Data Validation Plan** - Following a Commission use case determination, Xcel must develop a corresponding data validation plan for HCA results, solicit written input from stakeholders and include that information in the next HCA report.

As noted by the Department:

Order Point No. 17 is future-oriented and requires Xcel to develop 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, once the Commission determines the Use Case for Xcel's future HCAs.

The Department notes that the Commission has not yet determined the use case for Xcel's future HCAs. Xcel indicated that it is committed to complying with this Order Point in a subsequent HCA filing. The Department will evaluate compliance with this Order Point once the Commission determines the use case for Xcel's future HCAs and once Xcel develops a corresponding data validation plan, solicit written feedback from stakeholders, and includes the final plan in the next HCA report.³⁵

*Staff agrees with the Department that this is a future requirement that will be reviewed once the Commission further weighs in on use cases. Staff further recommends that it would be useful to carryover Order Point 17 to ensure clarity in future requirements and recommends adoption of (**Decision Option 17**).*

- **Order Point 18-20: Progress on Privacy and Security Issues Pertaining to CEUD and Grid Data** - Exploration and explanations of issues related to grid and customer energy usage data privacy and security concerns (see Commission Investigation docket E002/M-20-800)

As noted by the Department, "The Department, through a subject matter expert, plans to provide a report and recommendations on customer confidentiality and privacy issues as it pertains to the use of and third-party access to customer energy use data."³⁶ ILSR recommended that the Commission should, after considering stakeholder input in Docket No. E999/CI-20-800, rule whether Xcel Energy must comply with Order Point 12 of the July 2020 order related to the granularity of data displayed on the public map. If the Commission rules that Xcel must comply with Order Point 12, it should levy financial penalties if the Company does not comply. (**Decision Option 12**)

There is an ongoing process of evaluating customer confidentiality and privacy concerns in Docket Nos. E,G999/M-19-505 and E,G999/CI-12-1344, and E999/CI-20-800; staff does not address these issues here and refers readers to those dockets. Staff recommends taking no action on this item and the Commission

³⁵ Department Initial, p. 11

³⁶ Department Initial, p. 11

may which to revisit this issue in future HCA reviews following progress or conclusion in the Docket No. E999/CI-20-800.

- **Order Point 24: Next Filing Date** - The next report shall be filed on November 2, 2020

As noted by the Department, Xcel filed its 2020 HCA on November 2, 2020 and therefore met this requirement.³⁷

Staff agrees and no action is necessary. Additionally, statute requires the report be filed with the biennial transmission projects report, on the odd-numbered years. Therefore, Xcel is required by statute to file the report in 2021 and no deadline is required by order. For the 2021 HCA Order, an order point regarding the next filing date would be useful for reference and clarity as to which date the 'off-year' filings should be made, as the Commission in its 2018 HCA Order required annual filings (consistent with Xcel's proposal for annual HCA Report filings).

3. Public Facing Map Order Requirements

- **Order Point 6: Additional Data for Online Map Pop-Up Data** - Include additional data provided in HCA and on pop-up maps (transformer name, transformer absolute min, load tap changer or regulator, feeder absolute min, and networks or radial)

Xcel noted this information is now included in the online map pop-up information.³⁸ The Department reviewed both the public-facing map and the feeder Tabular Results and notes that the information contains the information required by Order Point No. 6. The Department concludes that Xcel complied with Order Point No. 6.³⁹

Staff agrees and no Commission action is necessary.

- **Order Point 12: Online Map Display (Color Coding of Lines v. Blocks)** Include locations of distribution lines vs. broad blocks of color on the HCA online map

Xcel noted that it has security concerns with fulfilling this requirement and includes details in Att. E. *Staff notes that additional work on this issue is on-going in Commission Docket E999/CI-20-800 and therefore does not address this further here.*⁴⁰

³⁷ Department Initial, pp. 11-12

³⁸ Xcel 2020 HCA, p. 23

³⁹ Department Initial, p. 13

⁴⁰ Also see Department Initial, p. 14-15

4. Frequency of HCA Updates, Use Cases, Cost, Data Validation Needs, and MN DIP Integration

Through the comment and reply process, no clear path emerged on either the cost of a monthly HCA update or how to integrate with the MN DIP. Notably, during the past year – Xcel began to update their HCA *quarterly* and recently filed notification of such in August 2021. The Commission ordered several points in its 2020 HCA Order related to these issues:

- **Order Point 4: Use Case evaluation** - Continued evaluation (and stakeholder collaboration) in evaluating the costs and benefits of meeting the following HCA objectives: 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 automating interconnection studies
- **Order Point 5: Opportunities to Integrate the HCA into the MN DIP** - Identification of opportunities to integrate the HCA and MN DIP
- **Order Point 9: Long-term use of HCA in the Interconnection Process** - Long term goal to use the HCA in the interconnection process/MN DIP Fast Track Screens; general requirements to work with stakeholders to refine HCA (related to MN DIP integration)
- **Order Point 10: Frequency of HCA Updates** - Xcel shall provide options (including costs) for monthly, quarterly, and semi-annual HCA updates.

The Department evaluated these order points and concluded, essentially, that Xcel had complied (as it had filed related information in its 2020 HCA Report that outlined potential futures and costs and participated in stakeholder sessions).⁴¹ However, as described in this section, there are still on-going discussions on what the costs are to shifting to these updates and what system upgrades or data is needed. Therefore, staff agrees with the Department that these order points have been met, but also agrees with the Department that further work is needed. The Department also noted that the Commission should consider input from other stakeholders on whether these order points have been complied with, largely, stakeholders agreed they had been met (with the exceptions noted by IREC).

Due to the issues not yet reaching a conclusion, staff recommends as an initial matter, carrying over 2020 HCA Order Points 4, 5 9, and 10 (amended as needed for future use) – these are reflected in Decision Options as (new staff proposed) Decision Options 18-21.

Xcel noted that in order to either increase the frequency of the updates to monthly, or allow for interconnection process automation, it would need significant funds for field data collection and verification. Xcel provided various levels of both costs and effort needed to reach differing levels of

⁴¹ Department Initial, pp. 8, 12

updates and automation and integration with the MN DIP.⁴² Xcel also outlines methods in which it could collect these costs, through the Transmission Cost Recovery Rider, or in some instances, from the interconnecting customer, where appropriate.

Through comment and reply, there was significant concern and uncertainty regarding Xcel's need for Primary and Secondary System data initiatives to support a move to monthly updates and whether those efforts are needed for HCA improvements or MN DIP integration or automation, and to what extent those initiatives overlapped, or were already underway in similar efforts, specifically efforts regarding Xcel's deployment of Advanced Data Management Systems (ADMS) and other actions.⁴³

Most all (City of Minneapolis, Fresh Energy, IREC, ILSR) stakeholders supported a requirement that the Commission order Xcel to move to a monthly HCA update (**Decision Option 5**) and that the Commission should not rely or base its decision on Xcel's financial projections and data validation needs. Stakeholders raised concerns such as not needing the Secondary system data validated, nor understanding the time it would take to conduct (2-3 years), among other general concerns.⁴⁴ Following stakeholder comments, in reply, Xcel filed amended 'paths' for consideration.

Xcel Reply Comments – Amendment Proposal (Path 1 and Path 2)

Through the proceeding and due to significant stakeholder concern regarding the cost assignment of data collection and field verification being assigned to the HCA (versus on-going ADMS field verification efforts or general utility practice) Xcel (attempting to find a path forward) proposed an amended proposal in reply comments (Path 1 and Path 2). Xcel believes the proposed paths are reflective of priorities it heard from stakeholders: 1) monthly updates are ideal; 2) increased availability and transparency regarding queued projects and needed system mitigations; 3) reduction of MN DIP timelines; 4) self-service/automated Initial Review Screens; and 5) Initial/Supplemental screens should be replaced or augmented with checks against the HCA values. Xcel states:

However, we understand that the costs we have conceptually estimated for such an initiative are significant, that the asset data efforts to support ADMS and this HCA/interconnection effort would overlap, and there may be delays in realizing tangible user benefits for the HCA and interconnection Use Cases. We therefore outline the functionalities and benefits of automation of the HCA and integration with the FTSRS [Fast Track Supplemental Review Screen] below when done with a full Primary System asset data effort in Part C below, and in Part D, we offer an alternative Path 2 that defers the Primary System data validation to a later point in time and

⁴² Xcel 2020 HCA Report, p. 22

⁴³ Xcel noted in reply, "The asset data collection and validation work we would do on the Primary System would be complementary to what is underway and planned for the Advanced Distribution Management System (ADMS). As we explained in our annual ADMS report submitted in Docket Nos. E002/M-19-666, E002/M-19-721, and E002/M-20-680 on January 25, 2021, the final phase of the ADMS project is contemplated to include data collection, validation, and testing of feeders that are necessary to support the additional advanced functionality of ADMS."

⁴⁴ IREC Initial, Fresh Energy Reply, City of Minneapolis Initial.

delivers improved HCA and interconnection tools consistent with the Commission's long-term goal sooner.⁴⁵

In either path, Xcel proposes to return to the Commission with a refined plan, costs, timeline, and proposal for cost recovery through the Transmission Cost Recovery (TCR) Rider in 2022. Costs and scope are summarized below of each path:⁴⁶

Path 1 – HCA Automation and Integration Combined with a Comprehensive Data Initiative in the Near-Term	Path 2 – Delayed or No Foundational Data Initiative
<p>Monthly HCA (First Deliverable)</p> <ul style="list-style-type: none"> • Timing: 15-18 months from project initiation⁴⁷ • Cost: One-time \$1.7-3.5 million, Annual: \$375-500,000 for engineering resources • Conduct the Primary System asset data initiative (in close coordination with the ADMS team) <ul style="list-style-type: none"> • Expected timeframe 2-3 years • Cost: \$27-32 million <p>Integration of the HC and Supplemental Review Screens: Automating FTSRS (Second Deliverable)</p> <ul style="list-style-type: none"> • Timing: 9-12 months (from first monthly HCA) • Cost: \$700,000-\$1.4 million <p>Initial Review Screens: Automation of the Initial Review Screens (Third Deliverable)</p> <ul style="list-style-type: none"> • Requires Secondary System asset data validation <ul style="list-style-type: none"> • Timing: 2-3 years (concurrent with Primary System validation) • Cost: \$13-16 million • Timing: concurrent with Third Deliverable 	<p>Monthly HCA (First Deliverable)</p> <ul style="list-style-type: none"> • Timing: 18-21 months (pilot monthly HCA in early 2023, full roll-out in mid-2023) • Some features still manual (minor inconsistencies) • <i>Staff notes: Primary Data Initiative not required for this path.</i> <p>Integration of the HCA and Initial/ Supplemental Review Screens</p> <ul style="list-style-type: none"> • Automating FTSRS (Second Deliverable) • Anticipated 50-75 percent faster review would drop to 25-50 percent improvement due to engineering input and quality control levels same as today's process <p>Integration of the HCA and the Pre-Application Data Reports</p> <ul style="list-style-type: none"> • Accuracy will improve, speed likely to stay the same (requiring engineering validation) <p><i>Staff notes: Cost information was not explicitly provided as it was for Path 1. See Table 1., Xcel Summary of Costs and Timelines (below)</i></p>

⁴⁵ Xcel Reply, p. 5

⁴⁶ Xcel Reply, pp. 9-19

⁴⁷ This would require the Primary System Asset Data Initiative to be complete first, which is expected to take 2-3 years. See p. 9, Xcel Reply.

<ul style="list-style-type: none"> • Cost: \$100,000-\$200,000 <p>Integration of the HCA and the Pre-Application Data Reports</p> <ul style="list-style-type: none"> • Proposed automation of the Pre-application data reports (Fourth Deliverable) • Requires Primary System data validation • Cost: \$375,000-700,000 	
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Xcel noted the difference between the two Paths, is whether Xcel does the Primary and/or Secondary Systems data initiative now or later. Path 2 allows for nearer term HCA and MN DIP improvements and waiting for the ADMS effort to be complete, then conducting an assessment of where the ADMS effort has gaps or is incomplete for the HCA/Interconnection use case.⁴⁸ Staff has difficulty ascertaining the explicit costs for Path 2 from Xcel's Table 1, shown below.

Table 1: Summary of Costs and Timelines

HCA or Interconnection Improvement	Timing (years)	Project Cost	Incremental Labor (per year)
Quarterly HCA Updates	<1	Manual Effort	\$375,000 - \$500,000
Addition of 2 HCA engineers and 1 GIS specialist		N/A	\$375,000 - \$500,000
Foundational Asset Data Initiative(s)	2-3	\$40M - \$48M	TBD
Primary		\$27M - \$32M	
Secondary		\$13M - \$16M	
Monthly HCA Updates (and foundational integrations and database development)	1.5-2	\$1.7M - \$3.5M	\$375,000 - \$500,000
Addition of 2 Modeling engineers and 1 GIS specialist		N/A	\$375,000 - \$500,000

Note: Improvements listed below rely on monthly HCA to be in service prior to work commencing.

Integrate with MN DIP – Supplemental Screens	1-2	\$700,000 - \$1.4M	TBD
Integrate with MN DIP – Initial Screens	1-2*	\$700,000 - \$1.4M	TBD
COMBINED Integration with MN DIP Initial and Supplemental Screens	1-2	\$800,000 - \$1.6M	TBD
Integrate the HCA and Pre-Application Data Report	1	\$375,000 - \$700,000	N/A

* Note: These costs are only if this work is done as a stand-alone initiative. Our implementation Paths contemplate the Supplemental and Initial Screens work occurring concurrently – and so if done together, the costs of that combined effort are shown in the next row: COMBINED Integration with MN DIP Initial and Supplemental Screens.

⁴⁸ Xcel Reply, p. 19

Additionally, staff has concerns that no party had an opportunity to review or consider these paths on the record as they were filed in replies (other than the Department who, helpfully, and out of comment period, provided some direction and conditions regarding cost recovery and cost tracking – specifically relating to potential cost recovery coming in the near term via the rate case or the next TCR rider). Additionally, the unclear nature and potential overlap of costs or delineation of costs per use case (see Department Supplemental, pp. 2-10) indicate more development and clarity is needed.

The Commission is in a tough spot, of likely wanting to ensure progress and useability of the HCA and moving to a monthly update – however, is faced with stakeholders’ concerns of Xcel’s approaches, unclear cost estimates and scope, as well as new proposals that have not had robust stakeholder input.

Last, the next HCA is due November 1, 2022 and is most likely under development from Xcel at the time of writing of these briefing papers.

Xcel is seeking direction from the Commission and provided in its reply comments, “We have explained that our first step with any or all of these initiatives would be to complete a detailed requirements and design effort that reflects the Commission’s direction, which will return a refined estimate of the costs. We are happy to start that work upon receiving further direction from the Commission on the specific futures it wants us to either further explore or implement. Similarly, we are prepared to initiate the actual projects, and in that case, we offer to submit a compliance filing in this proceeding with the refined cost and timeline estimates that result from our detailed requirements and design planning efforts.”⁴⁹

Staff agrees with stakeholders recommending that additional information is needed from Xcel before locking into any future use case and would encourage Xcel to file the ir proposed compliance filing – or to return with a refined cost estimates – or to simply include that information in the next HCA Report. The Department appears to agree that additional cost information would be required (and outlined its numerous attempts to obtain it from Xcel on this record)⁵⁰ before approving cost recovery (such as a cost-benefit analysis) as described below:

“The Department provided supplemental comments in response to Xcel’s Path 1 and 2 proposal it offered in reply. Due to the Department continued inability to get clarity on costs and initiative delineation from Xcel, the Department offered the following decisions options:

(Decision Option 14) The Department recommends that the Commission require Xcel 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. This analysis should clearly indicate which improvements are incremental to any existing and

⁴⁹ Xcel Reply, p. 20

⁵⁰ Department Supplement

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.

(Decision Option 15) The Department recommends that the Commission require Xcel to 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.

(Decision Option 16) The Department recommends that the Commission require Xcel to separately develop a proposal to implement the Fast Track Supplement Review Screen Use Case in the next hosting capacity analysis report consistent with the Commission's long-term goal of the hosting capacity analysis, and conduct a benefit-cost analysis of the FTSRS Use Case."

*Staff agrees with of the decision options put forward from the Department and recommends adoptions of **Decision Options 14-16.***

It is clear from stakeholders that moving to a monthly HCA update is the first and near-term goal and progress to that end should be continued. However, at this time, staff believes there is insufficient record and information to require Xcel to move to a monthly update and staff expects both Xcel to continue to ensure progress to a monthly update (as they have indicated in their filing and their Supplemental Reply Comments). Additionally, staff encourages Xcel to obtain stakeholder input on the costs and benefits of the newly proposed Path 1 and Path 2 in the next HCA iteration.

Therefore, staff does not make a recommendation regarding monthly HCA update frequency at this time and encourages Xcel to continue to develop their refined cost estimates, assess cost prudence, and pursue the most cost-effective option to obtain a monthly HCA update frequency and ensure progress on MN DIP integration. Last, most all stakeholders agree that it is premature to determine MN DIP integration pathways and use case outcomes, staff acknowledges that this decision is complex, and staff is available to assist if any Commissioners would like to pursue revised decision alternatives.

5. Further Stakeholder Work

- **Order Point 21 and 23: Implement 2019 Stakeholder Engagement Plan** - Must implement the stakeholder engagement plan as outlined in the 2019 docket and report the results of the stakeholder process, including the feedback and suggestions outlined by stakeholders in the 2020 HCA Report

As directed, Xcel and Commission staff, conducted the 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. Presentations and recordings of the sessions are available

in the docket and on Xcel's hosting capacity webpage, linked above. Notably, at the end of the third workshop, Xcel noted, "the participants agreed that there were no additional open topics and that the stakeholder workshops had successfully achieved the goal of addressing any short-term needs for the 2020 HCA."⁵¹

The Department outlined how Xcel implemented stakeholder outreach, both in regard to the 2019 Stakeholder Engagement Plan Xcel outlined but also, how it met Order Points 4 and 5 regarding working with stakeholders. The Department found Xcel complied with these Order Points and referenced Attachment D2 of Xcel's filing for additional information.⁵²

IREC argued that following the 2020 stakeholder workshops proposals to respond to Xcel's proposals, and requests to discuss initial and supplement review screens were ignored or rejected during stakeholder meetings (which IREC argued was in conflict with Order Point 5 and 22 requiring Xcel to do so).⁵³ Xcel disagreed with this assessment and indicated it took a different approach to discussion of use cases with stakeholders, which was compliance with the Commission's requirement and it meaningfully engaged with stakeholders.⁵⁴

- **Order Point 22: Commission Facilitation of HCA Stakeholder Work** - Commission staff are to oversee and facilitate a discussion with Xcel and stakeholders of the technical assumptions, limiting criteria, and thresholds used in Xcel's HCA (including 6 sub-topics outlined in order)

Commission staff facilitated discussions with Xcel and stakeholders. Summaries and links to recordings can be found in Xcel's 2020 HCA Report, Att. D2. The Department concluded these ordering points were met, and staff agrees (however, continued stakeholder work is recommended).

Most all stakeholders encouraged further stakeholder workshops, facilitated by Commission staff, that provide opportunity for stakeholders to put forth proposals for HCA integration into the MN DIP. Stakeholders provided:

- (Decision Option 7, a-c)** The Commission should order stakeholder workshops that provide for proposals put forward by stakeholders to incorporate the HCA into the interconnection process. (City, IREC, ILSR)
- a. To be convened by the Distributed Generation Work Group (IREC)
 - b. To be facilitated by Commission staff (City, ILSR, Fresh Energy)
 - c. Require the stakeholder workshop to be initially convened no later than Q1 2022 (IREC)

Stakeholders varied on involvement of the Minnesota Distributed Generation Work Group and whether to set a date certain for convening of the group. All stakeholders noted that additional time and

⁵¹ Id. p. 12

⁵² Department Initial, p. 12

⁵³ IREC Initial, p. 16

⁵⁴ Xcel Reply, pp. 27-28

facilitated discussion on use cases and MN DIP integration was needed.

Staff supports **Decision Option 7** and **sub-options a and b**. Staff is not recommending 7c, only as it established a Q1 2022 deadline for the initial stakeholder workshop. PUC staff has internally discussed and agreed that it could convene this workshop(s), likely through the DGWG, and would make every effort to meet a Q1 2022 deadline, however noted that additional flexibility was likely needed.

6. Load Hosting Capacity Analysis

Order Point 7: Use of HCA for Beneficial Electrification and Load Siting - Consideration of use of HCA for beneficial electrification or load hosting capacity in 2020 Integrated Distribution System Plan

The Department weighed in on Order Point 7 which required a discussion of how Xcel's HCA can be used to assist state energy policy goals related to beneficial electrification including detail on how a load hosting analysis would be done, an estimate of the resources that would be required, and the specific information the Company could provide. The Department provided:

"Xcel's October 30, 2020 Annual Update Compliance in Docket No. E002/M-19-666 is responsive to this Order Point. Xcel included a high-level discussion of how the DRIVE tool could be used to perform a load HCA analysis, and explained that such an analysis could serve as a starting point to guide load. Xcel also provided additional information related to the use of the DRIVE tool to perform the load HCA and the limitations of the approach, explaining that load HCA would not consider available substation capacity, contingency capacity (N-1), or optimization of an area to best serve potential load.

Overall, Xcel concluded that load HCA analysis could be used as a starting point to assist beneficial electrification, such as helping interested parties determine the best location for a new public/ commercial EV charging station that aligns with a major road corridor or area of interest, to target the location of a new building intended to be heated electrically, or to highlight opportunity for large-scale batteries to integrate into the system. The Department tentatively agrees that EVs and storage are topics that have the potential to be further explored in Xcel's HCA. The Department concludes that Xcel has complied with Order Point No. 7."⁵⁵

Xcel responded, "At present, the Use Case for the HCA is for generation only – and solar generation is by far the dominant type of DER interconnecting to our system. Producing an HCA for load resources such as storage and EVs would be a significant expansion that would need to be prioritized along with the potential HCA futures the Commission directed the Company to explore."⁵⁶

Key points from the Company's October 2020 Annual Update (in Docket E999/M-19-666) regarding

⁵⁵ Department Initial, pp. 6-7

⁵⁶ Xcel Reply, p. 28

HCAs for load:⁵⁷

- A load HCA would be useful for EVs (and charging stations), large new buildings that will use electric heat, and batteries, but would not include discharging DERs.
- The analysis of loads on the distribution system is complex
- The DRIVE tool could be used for the load HCA, however, a separate online mapping tool would likely be required
- Load HCA would likely only be relevant for load connections greater than 250 kW on primary distribution conductors (as secondary information is not available)
- Xcel would likely use Centralized allocation methods for load hosting capacity
- It is not yet determined whether generation and load could be run at the same time
- Like generation, load HCAs may not align with distribution system planning – and adjustment may be needed
- Planning criteria may need to be established around the analysis of system parameters and must account for operational flexibility
- Significant privacy and security concerns would need to be addressed (as maps could be telling of customer load information) – and a public map may not be viable, use of NDAs may be required⁵⁸
- Load HCA would require 100-200 hours of engineering and mapping per full time analysis.

Most stakeholders continue to support requiring Xcel to conduct a load HCA. Fresh Energy noted that, “... beneficial electrification is a key element of Minnesota’s work to reduce greenhouse gas emissions as the pace climate change demands. The state, utilities, and local governments are recognizing this need and moving forward with programs and policies to bring more electric vehicles to Minnesota and encourage more Minnesotans to heat their homes and water with efficient electric appliances.”⁵⁹ Staff notes that the statute largely contemplates generation resources, not load, however, as DERs become more dynamic and flexible in their use and system contribution, staff agrees it would be useful to more fully utilize the DRIVE tool that has components available for load HCAs (or at a minimum begin to get started in understanding its capabilities and potential functions and uses).⁶⁰

(Decision Option 6) Require Xcel to perform an HCA for load. (City, Fresh Energy, IREC, ILSR)

⁵⁷ Xcel Compliance Filing – Integrated Distribution Plan Annual Update, See Doc. ID: [202010-167865-01](#), p. 25

⁵⁸ Staff notes this aligns with the concerns of some stakeholders that Xcel is using the HCA and associated tools to further internal data development, contrary to the intent of the statute to publicly release information about system availability and use.

⁵⁹ Fresh Energy Reply, pp. 2-3

⁶⁰ Staff notes that a load HCA is not contemplated by statute, and Xcel has a greater incentive to find efficient locations for future load – however that information is not public. As, and if, load HCA moves forward, issues of data availability, transparency, and cost – will continue to emerge (as noted, in part, by Xcel).

Staff supports decision option 6 and recommends Xcel propose a framework for a load HCA with stakeholders in future workshops, and file a load HCA in its 2022 HCA Report.

(Staff Amended Decision Option 6) Require Xcel to perform an HCA for load and file the analysis by November 2022. (Staff Amended)

7. Additional Requests from IREC

In its comments, IREC outlined several additional issues it would like the Commission to require Xcel to pursue:

- **(Decision Option 8)** Require Xcel to move toward providing hourly HCA results using the 24 hour load profile of each month's peak day and minimum (576 analysis), including an analysis of:
 - a. the daytime minimum load hour for each month of the year (1 data point for each of the 12 months), for the benefit of customers designing DER with only solar generation,
 - b. the absolute minimum load hour for each month of the year (1 data point for each of the 12 months), for the benefit of customers designing DER that export outside of daytime hours, *i.e.*, energy storage systems paired with solar generation, and
 - c. the single highest (peak) load hour for each month of the year (1 data point for each of the 12 months), for the benefit of customers designing DER with new loads.
- **(Decision Option 9)** Xcel shall modify their load interconnection policies to account for distributed solar when considering large load interconnection.
- **(Decision Option 10)** After modification of Xcel load interconnection policies, Xcel shall include existing distributed generation in its HCA load analysis.
- **(Decision Option 11)** Xcel shall include queued projects in its HCA.

Xcel provided responses to each of the additional items requested by IREC in its reply comments. Xcel's responses indicate that the requests of IREC are in some cases in conflict with or would require modification of the MN DIP and interconnection procedures (allowing for seasonal constraint avoidance), and could cause confusion by complicating the hosting capacity information.

Staff does not recommend inclusion of the recommendations from IREC (Decision Options 8-10) at this time, but request that these issues be part of the next series of stakeholder workshops and reported on in the 2022 HCA Report.

VIII. Decision Options

1. Accept Xcel's 2020 HCA Report and HCA (Xcel, Department, ILSR agrees – but with conditions)
2. Maintain [2020 HCA] Order Point No. 8 for future HCA reports. (Department)

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.

Criteria Violation/Unique Line Segments Options (Alternatives, pick 3 or 4 or 4 as amended)

3. Xcel shall fully comply with OP 11 and OP 15 requirements to publish all criteria violation and unique line segment numbers on the map within 30 days. (City, IREC, ILSR)
4. Xcel shall fully comply with OP 11 and OP 15 requirements to publish all criteria violation and unique line segment numbers on the map by November 1, 2021. (Fresh Energy)

(Staff Amended Decision Option 4) Xcel shall fully comply with ~~OP 11 and~~ OP 15 requirements to publish all criteria violations ~~and unique line segment numbers~~ on the map by _____
~~November 1, 2021.~~

HCA Update Frequency

5. Establish a firm date by which Xcel must begin updating its HCA on a monthly basis. (City, Fresh Energy, IREC, ILSR)

HCA Conducted for Load

6. Require Xcel to perform an HCA for load. (City, Fresh Energy, IREC, ILSR)

(Staff Amended Decision Option 6) Require Xcel to perform an HCA for load and file the analysis by November 2022. (Staff Amended)

Stakeholder Workshops

7. The Commission orders stakeholder workshops that provide for proposals put forward by stakeholders to incorporate the HCA into the interconnection process. (City, IREC, ILSR)
 - a. To be convened by the Distributed Generation Work Group (IREC)
 - b. To be facilitated by Commission staff (City, ILSR, Fresh Energy)
 - c. Require the stakeholder workshop to be initially convened no later than Q1 2022 (IREC)

IREC Additional Recommendations

8. Require Xcel to move toward providing hourly HCA results using the 24 hour load profile of each month's peak day and minimum (576 analysis), including an analysis of (IREC):
 - a. the daytime minimum load hour for each month of the year (1 data point for each of the 12 months), for the benefit of customers designing DER with only solar generation,

- b. the absolute minimum load hour for each month of the year (1 data point for each of the 12 months), for the benefit of customers designing DER that export outside of daytime hours, *i.e.*, energy storage systems paired with solar generation, and
 - c. the single highest (peak) load hour for each month of the year (1 data point for each of the 12 months), for the benefit of customers designing DER with new loads.
9. Xcel shall modify their load interconnection policies to account for distributed solar when considering large load interconnection (IREC).
 10. After modification of Xcel load interconnection policies, Xcel shall include existing distributed generation in its HCA load analysis (IREC).
 11. Xcel shall include queued projects in its HCA (IREC).
 12. Xcel shall use standard feeder names in the sub-feeder results within 30 days and in all future reports (IREC).

ILSR Additional Recommendations

13. The Commission should, after considering stakeholder input in Docket No. E999/C120-800, rule whether Xcel Energy must comply with Order Point 12 of the July 2020 order. If the Commission rules that Xcel must comply with Order Point 12, it should levy financial penalties if the Company does not comply (ILSR).

Department Conditions on Cost Recovery and Cost Benefit Analysis

14. Require Xcel 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. 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. (Department)
15. Require Xcel to 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. (Department)
16. Require Xcel to separately develop a proposal to implement the Fast Track Supplement Review Screen Use Case in the next hosting capacity analysis report consistent with the Commission's long-term goal of the hosting capacity analysis, and conduct a benefit-cost analysis of the FTSRS Use Case. (Department)

Additional Ordering Points from 2020 HCA Order to Carry-Over (all Staff Proposed)

17. Following a Commission determination of the Use Case for future HCA reports, Xcel must develop 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 Point 17)
18. Xcel shall collaborate with stakeholders in evaluating the costs and benefits associated with a hosting capacity analysis able to achieve the following objectives: 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. (2020 HCA Order Point 4)

19. Xcel is directed to 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 Point 5)
20. 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 Point 9)
21. In its 2021 HCA, Xcel must provide options for monthly HCA updates, including cost estimates. (2020 HCA Order Point 10, as modified by staff for the 2021 HCA year)

Staff recommends: 1, 2, 4-as amended by staff, 6-as amended by staff, 7a and b, 14-21.