STATE OF MINNESOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION

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

In the Matter of Xcel Energy's 2020 Hosting Capacity Report	Docket No. E002/M-20-812

COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC. ON XCEL ENERGY'S 2020 HOSTING CAPACITY ANALYSIS

DATED: April 7, 2021

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I. Introduction

On November 2, 2020 Xcel Energy filed its 2020 Hosting Capacity Analysis (HCA) Report, on December 2, 2020 the Minnesota Public Utilities Commission (Commission) issued a notice requesting that parties file comments on the 2020 HCA Report, and on March 1, 2021 the Commission extended the comment period. Pursuant to those notices, the Interstate Renewable Energy Council, Inc. (IREC) hereby submits these comments.

IREC is a 501(c)(3) non-partisan, non-profit organization working nationally to build the foundation for rapid adoption of clean energy and energy efficiency to benefit people, the economy and our planet. Our vision is a 100% clean energy future that is reliable, resilient and equitable. In service of our mission, IREC advances scalable solutions to integrate distributed clean energy (*i.e.*, renewable energy, energy storage, electric vehicles, and building electrification) onto the grid safely, reliably, and affordably. IREC's regulatory program works to improve the rules, regulatory policies and technical standards that enable the streamlined, efficient and cost-effective installation of distributed energy resources (DERs). Through our work to advance and support thoughtful and effective grid modernization throughout the United States, IREC has emphasized hosting capacity analysis (HCA) as a key tool in harnessing the benefits of DERs while helping to solve the challenges of interconnecting DERs in increasing quantities.

IREC is pleased to see that the requirements set by the Commission's July 31, 2020 HCA Order, including that Xcel provide more basic grid data and more granular reporting of HCA results,[1] have provided Minnesotans access to significantly more distribution grid data than ever

[1] Dkt. E002/M-19-865, Order Accepting Report and Setting Further Requirements, at 14-15 (July 31, 2020) (July 31, 2020 HCA Order).

before. IREC is also pleased that Xcel posits that its use of more actual feeder daytime minimum loads in the 2020 HCA, based on IREC's recommendation and required by the Commission's Aug. 15, 2019 HCA Order, has resulted in less feeders incorrectly showing zero hosting capacity.[2] Accordingly, IREC suggests that the Commission continue to direct specific enhancements to Xcel's HCA.

First, in order to provide customers useful information when they need it, and to prepare the HCA to meet the Commission's long-term goal for use in the interconnection screening process,[3] the Commission should set a monthly update cycle. The requisite procedures, costs, and time necessary to enable a monthly update cycle are considerably less onerous than what Xcel presents in its 2020 HCA Report. The scope of Xcel's proposed field verification program is inflated to include the entire secondary distribution system, which no stakeholder proposes to include in the HCA, and is duplicative of existing field verification efforts on the primary distribution system. Moreover, Xcel's cost estimates are not reasonable for the Commission to rely on when making decisions because they are so immature and undeveloped that Xcel calls them "conceptual" and acknowledges that they could "vary greatly" from actuals.[4] Based on reported implementation timelines from other utilities, IREC expects that Xcel could automate its model building and implement an effective computerized data validation process in a year or

[2] *See* Xcel Energy Hosting Capacity Analysis Report, Attachment A at 23 (Nov. 2, 2020) (Xcel 2020 HCA Report) ("The number of feeders with zero maximum hosting capacity decreased by seven from the 2019 analysis, and this was likely the results of using more actual daytime minimum load data for feeders with SCADA in the 2020 analysis."); Dkt. E002/M-18-864, Order Accepting Study and Setting Further Requirements, at 14 (Aug. 15, 2019) (Aug. 15, 2019 HCA Order) ("Xcel shall make the tracking and updating of actual feeder daytime minimum load a priority in 2019, and include those values in its 2019 hosting capacity analysis.").

[3] July 31, 2020 HCA Order at 14 (Ordering Paragraph 9).

[4] Attachment A, Xcel Energy Response to IREC Information Request No. 10, at 3.

less.[5] After Xcel increases the frequency and granularity of its HCA, it will be more suitable for use in the interconnection screening process.

The Commission should order that the Distributed Generation Working Group entertain proposals put forward by stakeholders to incorporate the HCA into the interconnection process in Q1 2022. The proposals in Xcel's 2020 HCA Report for integrating the HCA into the interconnection process do not provide sufficient transparency or customer benefit to warrant the Commission's consideration in this proceeding.

II. To provide customers useful information and meet the Commission's goal of using HCA results in the interconnection process, Xcel must perform monthly HCA updates.

Xcel's decision to provide quarterly updates to its HCA,[6] while an improvement over annual updates, is not sufficient to provide customers up-to-date information about the hosting capacity of a circuit, or to meet the Commission's long-term goal of using HCA results in the interconnection process. Customers need up-to-date information in order to identify locations that can support the new DER. The benefits provided by an HCA—including preventing interconnection queue backlogs and unlocking the potential for new DERs by informing their siting and design—only materialize when a utility publishes up-to-date results. Customers will not make decisions based on HCA results they know to be outdated.

Monthly updates are useful to provide transparency for customers interested in installing new DERs, however if used as input to the interconnection screening process, the HCA must not include any out-of-date data. Therefore, as the Commission authorizes the use of HCA in the interconnection process it will also need to revisit the HCA update schedule. For example,

[5] See section VIII.C, below.

[6] Xcel 2020 HCA Report, Attachment F, at 3.

California requires utilities to perform monthly HCA updates and recently authorized the use of HCA in the interconnection screening process. To ensure the use of current conditions in the screening process, California now requires utilities to check to see if there have been any system changes since the last HCA update. If there have been changes, the utility updates the HCA at the point of interconnection and then uses the up-to-date results in the interconnection screening process.[7] Other states take a more aggressive approach to updating their HCA: in Hawaii utilities provide updates daily, and Nevada set a goal of working towards real time HCA updates.[8]

Customers and developers are deciding how to design and where to build new DERs every month of the year. The Commission should order Xcel to perform monthly updates so that customers have access to reliable results when they are needed and the HCA is ready for use in the interconnection screening process.

III. Xcel's workpapers do not support scope or costs of Xcel's proposed field verification activities.

Xcel's 2020 HCA Report includes a proposal to send staff to the field to verify a large swath of the data fields in its asset management database. However, Xcel already plans to verify much of its system data and has accounted for the costs of its ongoing field verification to the

[7] CA Pub. Util. Comm., Dkt. R.17-07-007 Rulemaking to Streamline Interconnection of Distributed Energy Resources, D.20-09-035 Decision Adopting Recommendations From Working Groups Two, Three, and Subgroup, at 40-41 (Sept. 30, 2020) (HCA is called Integration Capacity Analysis in California) ("Utilities use the Initial Review process to determine if the Integration Capacity Analysis values at the proposed Point of Interconnection need to be updated. If updated values are needed, . . . [Utilities] use the Integration Capacity Analysis tool on the specific electrical node or run the Integration Capacity Analysis on all the electrical nodes in the circuit . . . This proposal will ensure use of the most recent Integration Capacity Analysis values without impacting timelines for Initial Review . . . we require Utilities to share the results of any Integration Capacity Analysis updates with the interconnecting generator and explain any grid condition or interconnection queue changes.").

[8] NV Pub. Util. Comm., Dkt. R.19-04003, Order Approving Distribution Resource Plan Stipulation, Attachment 1, at 7 (Aug. 1, 2019) ("HCA shall include updates in a period of time shorter than monthly."); Hawaiian Electric, Locational Value Maps, https://www.hawaiianelectric.com/clean-energy-hawaii/integration-tools-and-resources/locational-value-maps (accessed March 24, 2021) ("maps are updated nightly").

Commission in other dockets.[9] The cost estimate provided for the field verification activities does not stand up to scrutiny, and field verification of such a large amount of data is not necessary in order to more frequently model the hosting capacity of the distribution system.

A. Xcel's cost estimates are not adequate for use in the Commission's decision-making processes.

Xcel labels certain field verification costs as "incremental" in the HCA Report[10] but they appear to cover the full cost of field data verification, including existing efforts whose costs are detailed in other dockets. After Commission Staff and IREC asked Xcel to justify these cost estimates in information requests, Xcel claimed that its field verification cost estimates are "conceptual" and that it

> might be able to identify further efficiencies that will serve to reduce the overall cost of a comprehensive Minnesota field data initiative . . . In summary . . . a more refined data collection and validation estimate could vary greatly from the conceptual estimate contained in our filing.[11]

If a cost estimate is so immature and undeveloped that it could "vary greatly" from actuals, then it is not reasonable for the Commission to rely on that cost when making decisions.

Similarly, Xcel's 2020 HCA Report labels the cost of staffing engineering and GIS positions for the HCA as "incremental," but Xcel did not indicate that it subtracted from its cost estimate the time that its employees currently spend performing the HCA, budgeted for performing quarterly updates, or budgeted for existing field verification efforts. Like in Xcel's 2019 HCA Report, where it proposed HCA costs did not withstand scrutiny as incremental and

[9] *See* Xcel Energy Response to Minnesota Public Utilities Commission Information Request No. 1 (Jan. 25, 2021) (Xcel Energy Response to PUC Information Request No. 1); Attachment A, Xcel Energy Response to IREC Information Request No. 10 (Feb. 12, 2021).

[10] Xcel 2020 HCA Report, Attachment F, at 3-4.

[11] Attachment A, Xcel Energy Response to IREC Information Request No. 10, at 3.

double-counted certain costs,[12] Xcel's proposed costs in the 2020 HCA Report do not withstand scrutiny. The Commission should not rely on undeveloped cost estimates when deciding the frequency of HCA updates.

B. Xcel proposes to verify more data than is necessary to model hosting capacity.

Xcel's 2020 HCA Report proposes to verify a large set of data that is not needed in order to perform hosting capacity analyses. Xcel proposes to spend $13-16 million to verify the secondary system,[13] yet Xcel's HCA does not model the secondary system and no stakeholder has proposed that Xcel do so. The Commission should disregard any cost and time estimates associated with the verification of the secondary system because Xcel agrees that modeling the secondary system is unnecessary to increase the frequency of HCA updates.[14]

As explained above, Xcel has an existing field verification program that covers a large portion of its primary system. Xcel indicates that its "conceptual" proposal for HCA data validation includes 93 data fields, 48 of which are covered by Xcel's existing data validation efforts.[15] Of the remaining 45 data fields, 31 of them typically are not used in the power flow models used to perform HCA on the primary system.[16]

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[12] Dkt. E002/M-19-685, Comments of the Interstate Renewable Energy Council, Inc. on Xcel Energy's 2019 Hosting Capacity Analysis, at 10-12 (Dec. 30, 2019).

[13] Xcel Energy 2020 HCA Report, Attachment F, at 12 (Table 2).

[14] Xcel Energy Response to PUC Information Request No. 1(b) at 4 ("Field verification of secondary assets is not necessary to increase the frequency of the HCA to monthly.").

[15] Attachment A, Xcel Energy Response to IREC Information Request No. 10, Attachment A.

[16] IREC does not understand how the following 31 data fields would be useful in an HCA analysis of the primary system: Land Lot Centroid Relations, OH ATO: Location, OH Fuse: field stencil; OH Switch: field stencil, tie switch indicator; OH Transformer Bank: field stencil, bank configuration, facility tag x, facility tag y, output voltage, secondary location; Pole: framing type; Primary Meter: company number, facility tag x, facility tag y, Location; Recloser Bank Unit: type, curve; Sectionalizer Bank: company number; Switching Facility: Company Number, facility tag x, facility tag y; UG ATO: Location; UG Transformer: facility tag x, facility tag y, field stencil, output voltage, Location; UG Transformer Bank Unit: rated kva, protection type.

IREC does not question Xcel's use of the remaining 14 data fields in the HCA, however, data validation can likely be performed without rolling trucks to the field by deploying automated scripts to clean up feeder models and other tools.[17] Other utilities validate their primary system data without extensive field verification efforts and update their HCA monthly.[18] While some primary system field verification may be needed, Xcel's filing fails to justify its proposal to send staff to the field to verify a large swath of primary and secondary system data fields.

C. Xcel fails to justify its claim that a sweeping field validation effort is a prerequisite for more frequent HCA updates.

The 2020 HCA Report does not identify a causal relationship between the frequency of HCA updates and the speed of Xcel's field verification efforts. If Xcel's primary system data is inaccurate for an annual or quarterly update, it will also be inaccurate for a monthly update. And as explained above, other utilities have computerized and automated their data validation processes to facilitate monthly updates without an extensive field verification program.

Further, it is unlikely that most feeders will have significant changes every month. It is more likely that most feeders will not need to be updated more than once a year. More frequent HCA updates are unlikely to require significantly more feeder models to be rebuilt ever year; instead the models will be rebuilt in the same month that the change occurs rather than waiting

[17] *See* NV Pub. Util. Comm., Dkt. 19-04003, NV Energy Distributed Resources Plan, at 19 (April 1, 2019) ("To perform the initial HCA analysis for this filing, the preparation of NV Energy's distribution system models for use in Synergi required several clean-up scripts to be run to ensure proper functioning of the Synergi software."); Pacific Gas and Electric Integration Capacity Analysis (ICA) Data Validation Process (09-09-2019); Southern California Edison ICA Quality Control and Validation Process (09-09-2019); San Diego Gas & Electric Data Validation (09-09-2019), available at CA Pub. Util. Comm., Dkt. R.14-08-013, Reply Comments of the Interstate Renewable Energy Council, Inc. on Refinements to the Integration Capacity Analysis, Attachments 2-4 (Sept. 30, 2019).

[18] None of the HCA data validation plans reviewed by IREC include an extensive field verification program. *Id*.

for an annual or quarterly cycle. Most feeders do not see significant changes every year and therefore will not need to be rebuilt at all. For example, using the thresholds that Xcel selected, it identified that one-third of its feeders underwent a significant change between the 2017 and 2018 HCA.[19] There may be a small number of feeders that see multiple significant changes over the course of the year, and a monthly update cadence could mean performing an analysis on those feeders more than once a year. A monthly update cadence is unlikely to require many more feeder model rebuilds than a quarterly update. The primary difference is that Xcel would be required to publish the results of its analysis in the month that it performs the analysis rather than waiting until the end of the quarter for publication.

IV. The Commission should order Xcel to perform its analysis using monthly load data.

A. The Commission should order Xcel to perform a monthly analysis that is useful for solar only projects, as well as projects that include energy storage.

Xcel's HCA should provide monthly results to allow a developer to design DERs that benefit the grid and avoid seasonal constraints. Xcel currently performs its HCA using only annual daytime minimum load.[20]

In order to provide more useful data for customers seeking to design photovoltaic (PV) systems that avoid seasonal constraints, Xcel should publish HCA results using daytime minimum load in each month of the year. For example, if a line section could support a 2 MW PV system for 11 months of the year, but only a 1 MW system in the remaining month, a customer could build a 2 MW system and agree to limit its output to 1 MW during the one month

[19] Xcel 2020 HCA Report, Attachment A, at 10; Dkt. E002/M-19-685, Xcel Energy 2019 Hosting Capacity Analysis Report, Attachment A at 5 (Nov. 1, 2019) (Xcel 2019 HCA Report) ("We rebuilt (i.e., extracted GIS asset data for) approximately one-third of the feeders in the analysis, focusing on those feeders that had experienced large configuration, load, or generation changes.").

[20] Xcel 2020 HCA Report, Attachment A, at 15.

in which the constraint exists. In this way, the customer can build the system at the size she desires while avoiding the need for upgrades to Xcel's distribution system with a seasonal output limit.

Next, in order to provide more useful data for customers seeking to design systems based on other generation types, Xcel should publish HCA results using absolute minimum load in each month of the year. In the same way that a customer can design a PV-only system to avoid seasonal constraints using results with daytime minimum load, a customer can design a system using other generation types (such as solar+storage) to avoid seasonal constraints using results with absolute minimum load.

As a long-term goal, Xcel should move towards providing hourly HCA results using the 24 hour load profile of each month's peak day and minimum day. This is commonly called a 576 analysis, named after the 576 load data points it uses ((24 hours from each month's peak load day + 24 hours from each month's minimum load day) * 12 months = 576). For the next iteration of Xcel's HCA, IREC recommends an incremental step in that direction by including an analysis of:

- 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,
- 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
- 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.

IREC's recommendation includes a total of 36 load data points, and by doing so provides customers the ability to see seasonal variations in hosting capacity instead of only the most restrictive hours of the year.

B. To facilitate the electrification of vehicles and buildings, Xcel should perform HCA for load.

The transition to a low-carbon economy requires the electrification of vehicles and buildings, and hosting capacity maps are an important tool that can provide an understanding of where the best opportunities for placing new DER load on the electric grid exist. There is also untapped potential for growth in distributed energy storage (as a standalone project or paired with distributed generation), especially as costs continue to decline and customer demand for resiliency increases. An HCA load analysis would not be difficult for Xcel to perform as both software tools that Xcel uses for its HCA, DRIVE and Synergi, can perform this load analysis.[21] An HCA load analysis can also provide important insight for the Commission and other stakeholders as they review and approve long-term integrated distribution plans and investments, with the aim to integrate these resources in the lowest cost manner for the benefit of all ratepayers.

The Commission and Xcel agree that a load analysis would be useful.[22] Despite this, Xcel has not included in the HCA a load analysis that meets the goals outlined by stakeholders including IREC, Fresh Energy and the City of Minneapolis.[23]

[21] Dkt. E002/M-19-166, Xcel Energy Integrated Distribution Plan – Annual Update, at 26-27 (Oct. 30, 2020) (Xcel 2020 Load HCA Discussion); Dkt. E002/M-19-685, Comments of the Interstate Renewable Energy Council, Inc. on Xcel Energy's 2019 Hosting Capacity Analysis (Dec. 30, 2019), Attachment A: Xcel Energy's Response to IREC Information Request No. 11 (Dec. 17, 2019). As noted above, this analysis should be performed using monthly peak load data.

[22] Aug. 15, 2019 HCA Order at 12; July 31, 2020 HCA Order at 7. Xcel agrees that "load HCA can still serve as a starting point to guide load interconnections." Xcel 2020 Load HCA Discussion at 26.

[23] July 31, 2020 HCA Order at 6; Dkt. E002/M-19-865, Comments of the City of Minneapolis at 1 (Jan. 27, 2020) ("Minneapolis views the HCA as an important planning tool to . . . support beneficial electrification at the levels required to meet state and local climate goals.").

C. Good utility practice requires Xcel to modify its load interconnection policies to account for existing distributed generation.

Xcel argues that its analysis of load hosting capacity should not include existing solar generation because it "does not align with current planning practices that do not include solar generation when considering large load interconnections."[24] Xcel should modify its current planning practices to align with good utility practice, which accounts for the remaining useful life of existing distributed generation.

It is unreasonable to assume that capital-intensive distributed generation, which the grid is often modified to accommodate, will disappear before the end of its useful life. The typical useful life of a solar photovoltaic panel is approximately 20-30 years.[25] Customers invested significant time and capital to install distributed generation that they expect to serve their load for decades. Xcel often modifies its grid to accommodate this distributed generation. Failing to account for the remaining useful life of distributed generation when connecting new loads is an unreasonable practice. The Commission should question the prudence of distribution system upgrades Xcel requests to rate base on feeders with distributed generation while this unreasonable practice is in place.

After modifying its load interconnection policies, Xcel should include existing distributed generation in its HCA load analysis.

[24] Xcel 2020 Load HCA Discussion at 26.

[25] Solar Energy Industries Association, *Recycling & End-of-Life Considerations for Photovoltaics*, https://www.seia.org/initiatives/recycling-end-life-considerations-photovoltaics (accessed March 24, 2021) (In addition, projects typically budget for the installation of an new inverter at the end of the original inverter's useful life, which can be upwards of 10 years.).

V. Xcel should include queued projects in the HCA.

In order to be useful for customers seeking to design and site new DERs, queued projects should be included in the analysis. It is appropriate to include queued projects in the HCA under both interconnection use cases authorized by the Commission. First, when using HCA as an early indication of available hosting capacity, customers evaluate a circuit with the understanding that projects already in the queue have the first right to any available capacity. Second, when Xcel uses Minnesota's DER Interconnection Process to screen projects, Xcel must assume that all projects in the queue are built first.[26] Because both HCA interconnection use cases authorized by the Commission include queued projects, Xcel's analysis should assume that queued projects operate.

While the HCA generally represents the current state of Xcel's distribution grid, it also appropriately includes certain known future conditions. For example, Xcel assumes that any distribution system upgrades planned for the next six months will be online in the analysis.[27] Just as Xcel assumes that future upgrades are complete, it should also assume that queued generation operates.

Assuming that queued projects are operational is consistent with the practice of other utilities that plan to use the HCA in the interconnection process.

Some projects in the queue will not get built for various reasons. When a project exits the queue, it relinquishes its right to the hosting capacity on that feeder. Therefore, when a solar garden or a collection of projects above the HCA generation threshold enter or exit the queue,

[26] State of Minnesota Distributed Energy Resources Interconnection Process § 3.2.1 (initial review screens require consideration of existing and proposed DER on a circuit).

[27] Xcel 2020 HCA Report at 19-20.

Xcel should update that feeder's HCA during the next cycle. In this way, a frequently updated map will always reasonably reflect the available hosting capacity for new projects on the circuit.

VI. The Commission should order Xcel to fully comply with Ordering Paragraph (OP) 11 and OP 15's requirements to publish all criteria violations and unique line segment numbers on the map within 30 days.

The criteria violation values that Xcel published are useless to customers because it is impossible to determine the location on the distribution system that the values are associated with. This is because Xcel failed to comply with OP 11's requirement to publish line segment numbers on its map,[28] so it is impossible to correlate the results in Attachment C with a location on the map. Exacerbating the situation, Xcel also failed to comply with OP 15's requirement to publish all criteria violations on the map,[29] so it is impossible select a location on the map and then view the criteria violation results for that location.

Xcel is "able to display all HCA values and primary criteria violations" on the HCA map, but does "not do so due to concerns of readability/usability."[30] Xcel claims it cannot present unique line segment numbers on the map due to "technical limitations" associated with aggregating nodal results into line segments.[31] Yet multiple other utilities present this data—plus much more—on their HCA maps without problems. For example, Figure 1 below shows that NV Energy allows access to criteria violation values on its HCA map with a link to downloadable HCA results for that location in the pop-up box. Figure 2 shows that Southern California

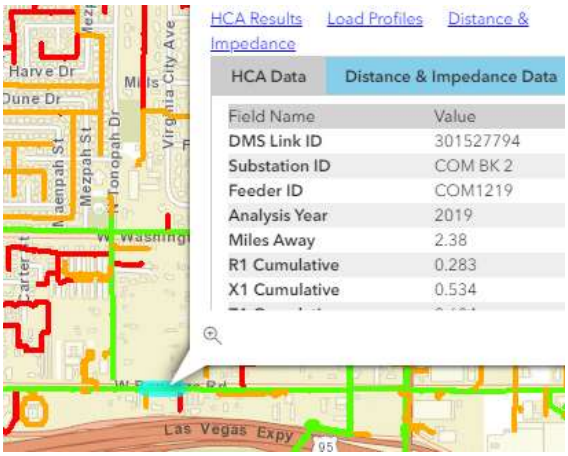
[28] Xcel 2020 HCA Report at 23 ("*Order Pt. 11*: Due to technical limitations, we were not able to include a unique name or number for each line segment in the HCA map pop-up.").

[29] Xcel 2020 HCA Report at 25 ("*Order Pt. 15*: We have 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.").

[30] Attachment A, Xcel Energy Response to IREC Information Request No. 4(B).

[31] Xcel 2020 HCA Report, Attachment A, at 23.

Edison's map similarly includes link to downloadable HCA criteria violation values for that location, as well as the line segment ID and node ID.

Figure 1: NV Energy HCA Map	Figure 2: Southern California Edison HCA Map
	

If Xcel had attempted to display this information on its map in compliance with the Commission's order, a logical first step would be to review HCA maps of peer utilities that met their regulatory requirements to display the data required in OP 11 and OP 15, and then evaluate if that same approach would work for Xcel. Yet Xcel did not even review other maps to figure out how to go about complying with the Commission's order.[32] Instead Xcel invokes vague and undefined concerns and limitations as a rationale for why it failed to fulfill its obligation to this Commission. Other utilities were able to overcome any obstacles to providing this data in the first year their HCA maps were published.

[32] Attachment A, Xcel Energy Response to IREC Information Request No. 4(A).

Xcel offers that if the Commission determines there is "value in including all violations and HCA values within the heat map pop-up" it will do so.[33] Yet the Commission already made this determination when OP 15 required that "Xcel must publish" the information on its HCA map.[34] There is no excuse for further delay. The Commission should order Xcel to fully comply with the requirements of OP 11 and OP 15 to publish this information on its map within 30 days.

VII. The Commission should order Xcel to use its standard feeder names in the sub-feeder level results within 30 days and in all future reports.

If Minnesota wants to enable interconnection customers and developers to design projects well suited to their location and to take advantage of the flexibility and capabilities of DER technologies, then customers need to able to easily access use of the HCA criteria violations in the sub-feeder level report. As IREC explained in last year's comments,[35] allowing customers to see the criteria violation values allows them to understand whether the violation can be addressed through an inexpensive system modification, *e.g.*, use of a smart inverter, or to better understand the type of distribution system upgrade that may be required in order to interconnect.

Xcel's criteria violation values in the sub-feeder level report are not useful because it is burdensome to identify which feeder the results are associated with. For example, Xcel's standard feeder names are used in its public queue, pre-application reports, the HCA map, and the feeder-level HCA results in Attachment B. Yet the sub-feeder level results in Attachment C

[33] Attachment A, Xcel Energy Response to IREC Information Request No. 4(B).

[34] July 31, 2020 HCA Order, at 15.

[35] Dkt. E002/M-19-685, Comments of the Interstate Renewable Energy Council, Inc. on Xcel Energy's 2019 Hosting Capacity Analysis, at 12-14 (Dec. 30, 2019).

do not include a column that clearly identifies Xcel's standard feeder names. Xcel acknowledges that this failure results in a report that "may not be intuitive to" use.[36]

Instead of providing a tool that is unintuitive to use, Xcel should simply publish a spreadsheet that is intuitive to use and includes its standard feeder name in a separate column. The Commission should order Xcel to add a column with traditional feeder names to Attachment C within 30 days and include the same data in all future reports.

VIII. Xcel must increase the frequency and granularity of the HCA before it is ready for use in the interconnection process.

A. It is premature for the Commission to consider specific proposals for the integration of HCA into the interconnection process in this proceeding.

The HCA, including all basic grid information displayed on the HCA map, is in need of more frequent and granular updates before it is ready to use in the interconnection process. The Commission should order that the Distributed Generation Working Group entertain proposals put forward by stakeholders for incorporation of HCA into the interconnection process in Q1 2022. Such proposals should be developed in a forum facilitated by Commission Staff and where Xcel cannot unilaterally prevent consideration of proposals presented by stakeholders, as it did in the 2020 workshop process.

IREC is not prepared to put forward such a proposal today or to fully respond to Xcel's proposals because Xcel disregarded the Commission's requirement in OP 5 to work with stakeholders to evaluate the HCA's ability to replace or augment the review screens.[37] For

[36] Attachment A, Xcel Energy Response to IREC Information Request No. 2(B). IREC was unable to follow the instructions provided by Xcel's Response to Information Request No. 2(B) to determine which feeders each value in the sub-feeder results is associated with.

[37] July 31, 2020 HCA Order, at 14 ("5. Xcel is directed to continue working with stakeholders to identify opportunities to integrate the HCA and the MN DIP . . . screening processes in future iterations of the HCA.").

example, IREC's timely request to discuss the individual initial and supplemental review screens, presented in Workshop 4, was first ignored and then outright rejected by Xcel in Workshop 6. Xcel's conduct contravened the Commission's intent for the regulated utility to work constructively with stakeholders, as well as the specific terms of the stakeholder process set by the Commission in OP 5 and OP 22.[38]

B. Customers benefit most from increased transparency into the interconnection process.

All the customer benefits from Xcel's HCA have resulted from the increased transparency provided by Xcel's HCA. Yet many of Xcel's proposals for incorporating the HCA into the interconnection process involve changing Xcel's internal processes without publishing additional data. For example, Xcel proposes to spend up to $1.6 million to automate data collection for its internal calculation of data used in the screening process.[39] However, the real value to customers of incorporating HCA into the interconnection process is derived from customers' ability to view the same data that Xcel has access to when screening projects.

Incorporating the HCA into the interconnection process without also increasing transparency fails to provide customers the vast majority of benefits they could derive from the HCA. IREC does not oppose Xcel embarking on an effort to improve or automate its internal systems for administering the interconnection process. Indeed internal process improvements are likely overdue, as evidenced by Xcel's inability to administer the MN DIP without incurring numerous customer complaints and significant fines. However there is no need for, or customer benefit derived from, the Commission vetting Xcel's internal process improvements in an HCA

[38] *Id.*; July 31, 2020 HCA Order, at 15-16 (workshop discussions should address "f. Other topics identified by stakeholders for review.").

[39] Xcel 2020 HCA Report, Attachment F, at 18-19.

proceeding. Put simply, Xcel should improve its internal interconnection processes as a part of its prudent management practices, and the Commission should focus its efforts on ordering Xcel to provide customers additional data via the HCA.

Further, IREC does not believe that additional automation of the pre-application report process should be prioritized at this time. Instead, Xcel should update all basic grid data on the HCA map on a monthly basis.

C. Automating the feeder model building and data validation process could enable Xcel to streamline its internal processes.

Xcel's observation that the model building process is the most time-consuming element of performing the HCA comports with IREC's understanding of other utilities' processes.[40] Yet Xcel's estimate that it would take 3-4 years to automate the model building process is unreasonably long. For example, Pacific Gas & Electric Company (PG&E) completed a program to automate its model building and data validation process in under 16 months.[41]

With prudent management, IREC expects that Xcel would be able to automate its model building and data validation process in significantly less time than PG&E for three reasons. First, PG&E's analysis includes over three times the number of feeders found in Xcel's Minnesota HCA. Second, Xcel has been publishing HCA results using the same software since 2016, while PG&E had only one year of experience with its HCA software when starting its process. Third, PG&E's GIS and asset management databases were in terrible condition at the start the project,

[40] *See, e.g.*, NV Pub. Util. Comm., Dkt. 19-04003, NV Energy Distributed Resources Plan, at 19 ("Preparation of the models in Synergi was the most resource-intensive and time-consuming aspect of performing the HCA.").

[41] PG&E implemented GridUnity's Network Model Management software beginning in Q1 2019 and reported that its maps included verified and published results on May 7, 2020. CA Pub. Util. Commission, Dkt. R.14-08-013, PG&E's Integration Capacity Analysis (ICA) Implementation Update, at 1 (May 7, 2020).

and to IREC's knowledge PG&E had not begun a concerted field data verification program similar to what Xcel has already started pursuant to its ADMS program.

Other utilities that update their HCA at monthly intervals—or more frequently—have performed similar model building and clean-up activities without a programmatic label or years-long process.[42]

The low end of Xcel's cost estimates for automating the feeder building process appear comparable to reports of the costs for *both* automating feeder building and data validation programs in other states, however there has been no thorough vetting of any actual costs in public dockets. Moreover, we would expect that Xcel would find efficiencies and cost savings as it implements more automated processes and completes its existing field verification activities.

The one-time expense of automating the model building process should be recovered from all ratepayers, not solely interconnection customers. Automating the model-building process will enable Xcel to perform more distribution engineering tasks using its power flow modeling software. This benefit is not limited to generation interconnection uses, but can also help the utility analyze the impact of new load, changes in circuit configuration, and other distribution planning activities. Therefore, it is not appropriate to allocate these one-time costs exclusively to interconnection customers.

Automating the most time-consuming part of the HCA process could reduce the amount of time it takes for Xcel to produce HCA results and could also automate certain load forecasting and load allocation processes associated with distribution planning. Accordingly, if Xcel invests

[42] *See, e.g.*, NV Pub. Util. Comm., Dkt. 19-04003, NV Energy Distributed Resources Plan, at 19; Southern California Edison ICA Quality Control and Validation Process (09-09-2019); San Diego Gas & Electric Data Validation (09-09-2019), available at CA Pub. Util. Comm., Dkt. R.14-08-013, Reply Comments of the Interstate Renewable Energy Council, Inc. on Refinements to the Integration Capacity Analysis, Attachments 3-4 (Sept. 30, 2019).

in such automation, the Commission should also require it to provide HCA results on a monthly basis and perform its analysis using monthly load data.

IX. Xcel withholds more data than is necessary to protect customer privacy.

Ordering Paragraph 18 of the July 31, 2020 HCA Order required Xcel to "separately evaluate and justify each privacy and security concern,"[43] and the Commission subsequently opened a separate proceeding to evaluate grid security policies. The notice opening Dkt. E999/CI-20-800 asks various questions about security concerns and then states: "Changes to customer privacy policies are not in scope."[44] Thus, the Commission intentionally bifurcated its consideration of customer privacy and grid security policies. Consistent with the Commission's instructions, IREC plans to address grid security policies in Dkt. E999/CI-20-800 and not here. In this section, IREC addresses Xcel's implementation of the Commission's existing customer privacy rules.

Since 2017, this Commission has required utilities to establish defined practices to protect the anonymity of customer energy use data (CEUD) before releasing such data to third parties.[45] Xcel Energy selected the 15/15 standard to determine if CEUD is sufficiently aggregated to be released.[46] The 15/15 standard provides that aggregated CEUD should not be released if it comes from a pool of less than 15 customers, or if a single customer's load makes up more than 15 percent of the pool.

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[43] July 31, 2020 HCA Order at 15.

[44] Dkt. E999/CI-20-800, In the Matter of a Commission Investigation on Grid and Customer Security Issues Related to Public Display or Access to Electric Distribution Grid Data, Notice Of Comment Period, at 2 (Oct. 30, 2020).

[45] Dkt. E,G-999/CI-12-1344, Order Governing Disclosure of Customer Energy Use Data to Third Parties, Requiring Filing of Privacy Policies and Cost Data, and Soliciting Comment, at 7-8 (Jan. 19, 2017) ("CEUD Privacy Order").

[46] Dkt. E,G-999/CI-12-1344, Xcel Energy, Compliance Filing—CEUD Aggregation and Release Policies, Privacy Policies of Rate-Regulated Energy Utilities, at 4-6 (Feb. 10, 2017); *id*. at 11.

On November 20, 2020 the Commission issued Open Data Access Standards which allow certain third parties to access aggregated CEUD in a limited set of circumstances.[47] IREC proposes that Xcel provide hourly load profiles for each substation and feeder in its public HCA for use by customers and DER developers. However, the new Open Data Access Standards are scoped narrowly and do not include the specific users or data sets that IREC proposes to include in the HCA. Therefore, the previously established 15/15 standard is applicable instead.

Use of 15/15 standard is mandated in other jurisdictions, including Colorado and California, to protect CEUD.[48] For example, the California Commission adopted the 15/15 standard to require the redaction of data "in order to ensure that the released data is sufficiently aggregated to prevent the identification of [CEUD] on individuals."[49] IREC believes the 15/15 standard is a reasonable and important way to protect customer privacy and has long supported its use.

However, Xcel applies the 15/15 standard incorrectly by using the standard as its rationale to redact data that is not related to a customer's energy use. This Commission defines CEUD as "data collected from the utility customer meters that reflects the quantity, quality, or timing of customers' natural gas or electric usage or electricity production."[50] Xcel applies the 15/15 standard to withhold *all HCA data* from feeders that violate the 15/15 standard "with the

[47] Dkt. E,G-999/M-12-1344, Order Adopting Open Data Access Standards and Establishing Further Proceedings, Open Data Access Standards (Nov. 20, 2020).

[48] Dkt. E,G-999/CI-12-1344, Xcel Energy, Compliance Filing—CEUD Aggregation and Release Policies, Privacy Policies of Rate-Regulated Energy Utilities, at 6; CA Pub. Util. Comm. Dkt. R08-12-009, Decision No. 14-05-016, Decision Adopting Rules to Provide Access to Energy Usage and Usage-Related Data While Protecting Privacy of Personal Data, at 26-27 (May 5, 2014) (D.14-05-016).

[49] D.14-05-016 at 26-27.

[50] CEUD Privacy Order, at 6.

rationale that publicly disclosing these feeders could compromise customer privacy."[51] Using the 15/15 standard to redact data that is not in any way related to a customer's energy use is an incorrect application of the standard. Protecting customer privacy is not a valid rationale for withholding data that has nothing to do with customer energy use. The following table shows the data that Xcel provides in its HCA, indicates if it that data is related to customer energy use, and if so, the rationale for redacting that data.

Table 1: Data Withheld by Xcel When a Feeder Violates the 15/15 Standard

Data	**Meets the definition of CEUD?**	**Rationale for redaction if data violates the 15/15 standard**
Substation name	No	None
Feeder name	No	None
Feeder nominal voltage	No	None
Line phasing (single/three)	No	None
Line type (overhead/underground)	No	None
Transformer name	No	None
Substation minimum load (daytime and absolute)	Yes	If the substation violates the 15/15 standard, a user may be able to identify the customer's minimum load. If a feeder violates the 15/15 rule, but the substation does not, Xcel should publish the substation's minimum load because that data is sufficiently aggregated to protect customer privacy.
Feeder minimum load (daytime and absolute)	Yes	If the feeder violates the 15/15 standard, a user may be able to identify the customer's minimum load. If a substation violates the 15/15 standard, but the feeder does not, Xcel should publish the feeder's minimum load because the feeder data is sufficiently aggregated to protect customer privacy.
Is load data actual or estimated?	No	None
Feeder peak load	Yes	If the feeder violates the 15/15 standard, a user may be able to identify the customer's peak load. If a substation violates the 15/15 standard, but the feeder does not (*i.e.*, if there is a large

[51] Xcel 2020 HCA Report, at 18.

		customer on only one feeder leading to a substation), Xcel should publish the feeder's peak load because the feeder data is sufficiently aggregated to protect customer privacy.
Substation peak load	Yes	If the substation violates the 15/15 standard, a user may be able to identify the customer's peak load. If a feeder violates the 15/15 standard, but the substation does not, Xcel should publish the substation's peak load because the substation data is sufficiently aggregated to protect customer privacy.
LTC or regulator	No	None
Network or radial	No	None
Existing installed DER (substation and feeder)	No	None
Queued DER (substation and feeder)	No	None
Date DER status updated	No	None
Notes	No	None
Hosting Capacity Results (MW)	No	None
Hosting Capacity Limiting Violation	No	None
Date hosting capacity updated	No	None
Field voltage regulator location	No	None
Substation location	No	None

California utilities similarly applied the 15/15 standard when establishing the scope of data to withhold from their HCA maps. For example, Southern California Edison (SCE) withholds from publication the load profile, a data set that includes peak load and minimum load, when a circuit violates the 15/15 standard.[52] When a data set violates the 15/15 standard, SCE also withholds the technical criteria violations for operational flexibility when those values equal load.[53] While Xcel does not use the operational flexibility criterion, it does plan to use the

[52] Southern California Edison, Integration Capacity Analysis User Guide, at 15 (accessed March 31, 2020), available at https://ltmdrpep.sce.com/drpep/downloads/ICAUserGuide.pdf.

[53] *Id.*

reverse power flow and unintentional islanding criteria,[54] which may equal load. If the reverse power flow and unintentional islanding criteria produce results that equal load, it would be appropriate to withhold that data. All of the other data provided in Xcel's HCA—including the existence of the feeder on the map—are published by California utilities when a feeder violates the 15/15 standard.

When a feeder violates the 15/15 standard, Xcel removes the feeder from its map such that the map appears blank where the feeder should appear, and no HCA data is published on the map. This practice results in the redaction of more information than is necessary to protect customer privacy and is different from California's application of the 15/15 standard to its HCA maps. For example, in California if a feeder violates the 15/15 standard, the exact location of the feeder lines are published on the map and all non-CEUD is published.[55] In place of CEUD, the pop-up box displays a note that says CEUD is not provided.

In conclusion, when the 15/15 standard calls for the redaction of CEUD to protect customer privacy, the Commission should allow Xcel to redact only load data and require Xcel to publish on its map, and in its downloadable spreadsheet, all other HCA data.

X. Conclusion

Xcel's 2020 HCA represents a substantial improvement from its earlier HCAs. These improvements are directly attributable to the Commission's July 31, 2020 HCA Order which directed Xcel to use and publish specific data in the HCA. Therefore, the Commission should continue to direct specific enhancements to Xcel's analysis.

[54] Xcel's 2020 HCA Report, Attachment A, at 17.

[55] *See* Southern California Edison, Integration Capacity Analysis User Guide, at 15.

The best way to increase the value of Xcel's HCA for customers is to switch to monthly updates, provide useful sub-feeder level results, and to perform an HCA for new load. Making these improvements will go a long way towards helping customers achieve Minnesota's goals for increased DER deployment, transportation electrification, and building electrification.

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Respectfully submitted,

By: /s/ Yochanan Zakai

Yochanan Zakai*
Sky Stanfield
SHUTE, MIHALY & WEINBERGER LLP
396 Hayes Street
San Francisco, California 94102
(415) 552-7272
yzakai@smwlaw.com
stanfield@smwlaw.com

Attorneys for Interstate Renewable Energy Council, Inc.

1351360.7

* Mr. Zakai is a member of the Oregon State Bar; he is not a member of the State Bar of California.