

STATE OF MINNESOTA  
BEFORE THE  
PUBLIC UTILITIES COMMISSION

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

In the Matter of the Submittal of Northern State Power Company, doing business as Xcel Energy, of the 2017 Distribution System/Hosting Capacity Study

DOCKET NO. E002/M-17-777

**REPLY COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC. ON XCEL’S 2017 DISTRIBUTION SYSTEM HOSTING CAPACITY REPORT**

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## I. INTRODUCTION

In response to the Commission’s November 15, 2017 Notice of Comment Period on Xcel Energy’s 2017 Distribution System Hosting Capacity Report, the Interstate Renewable Energy Council, Inc. (IREC) filed initial comments detailing our questions, concerns, and recommendations. IREC has reviewed the initial comments filed by the Department of Commerce (DOC) and Fresh Energy, as well as Xcel’s responses to the Commission’s information requests<sup>1</sup> and the Power System Consultants (PSC) report facilitated by Lawrence Berkeley National Laboratory.<sup>2</sup> IREC submits these reply comments to highlight consensus recommendations among the commenting stakeholders, which are central to creating a tool that will provide the expected benefits to ratepayers and optimize integration of distributed energy resources (DERs) into the distribution system. These recommendations include:

- Clearly defining the hosting capacity use cases to include streamlining the interconnection process and improving distribution system planning, and establishing a process to elaborate the hosting capacity use cases and their methodological needs;
- Requiring Xcel to conduct more rigorous testing and provide further detail on and justification for its use of the DRIVE methodology and its inputs and underlying assumptions, and either to make modifications to the methodology to satisfy all identified use cases or explore an alternative methodology to do so; and
- Improving the application of Xcel’s hosting capacity tool, including by requiring more frequent updating of the results and more granular data through the hosting capacity map and downloadable data files.

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<sup>1</sup> IREC was not aware of these filings until after submitting our initial comments and therefore incorporates our responses to this information in these reply comments.

<sup>2</sup> See Ranil deSilva & Randy Berry, Power System Consultants for Lawrence Berkeley National Labs, *Technical Review of Xcel Energy Energy’s Hosting Capacity Report* (Jan. 31, 2018) (“PSC Report”).

## II. KEY CONSENSUS RECOMMENDATIONS

### A. DEFINE AND ELABORATE THE USE CASES

As emphasized in our initial comments,<sup>3</sup> IREC remains concerned with Xcel’s narrow approach to the use of its hosting capacity analysis, which has not meaningfully improved since release of its 2016 hosting capacity report.<sup>4</sup> Xcel currently uses its hosting capacity analysis only as a “tool for external parties to understand potential areas in which to connect DER.”<sup>5</sup> While this application is an important one, we do not agree that the current version is informative enough to satisfy this use case; moreover, Xcel overlooks powerful uses of the hosting capacity analysis that would make it a truly effective tool in furthering the state’s grid modernization efforts, and its DER, environmental, and other goals. As DOC explains, “the modeling choice of the HCA . . . can lead to a path dependency for distribution system planning. In other words, decisions made at the end of the analysis may be unduly limited by decisions made at the beginning of the analysis.”<sup>6</sup> IREC agrees that, before Xcel proceeds further in developing a hosting capacity tool, the Commission should ensure that Xcel’s chosen methodology is ultimately capable of achieving all of the Commission’s goals and intended applications.

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<sup>3</sup> IREC Initial Comments at 17-19.

<sup>4</sup> *See* Comments of the Interstate Renewable Energy Council, Inc. Regarding Xcel Energy’s Hosting Capacity Report and Supplemental Comments at 7-12, Dkt. E-002/M-15-962 (Apr. 20, 2017) (noting the lack of detail in Xcel’s 2016 report on interconnection streamlining and distribution system planning use cases and urging explicit adoption of both).

<sup>5</sup> Response to Staff Information Request No. 10 at 1; *see also* Response to Staff Information Request No. 9 at 1 (“Areas with a higher level of hosting capacity allow customers or developers to quickly identify potential interconnection sites that will likely have minimal impact on Xcel Energy’s distribution system.”).

<sup>6</sup> DOC Initial Comments at 9.

The commenting parties are in agreement that the hosting capacity use cases should include interconnection streamlining and improving distribution system planning.<sup>7</sup> IREC encourages the Commission to expressly adopt these use cases and require that Xcel's 2018 hosting capacity report explain the measures that the company has taken to create a hosting capacity tool ultimately capable of meeting them. IREC agrees with Fresh Energy that Section 216B.2425, subd. 8 explicitly directs Xcel to engage in proactive planning for the "continued development" of DERs.<sup>8</sup> The Commission's August 1, 2017 Order likewise required a hosting capacity report that could "inform future distribution system planning efforts and upgrades necessary to facilitate the continued efficient integration of distributed generation."<sup>9</sup> And while Xcel's methodology in its current deployment may not be suited to interconnection streamlining, IREC encourages the Commission to embrace the potential for hosting capacity analysis to supplant conservative and imprecise interconnection screens, and improve the time- and resource-intensive detailed study process.<sup>10</sup>

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<sup>7</sup> Fresh Energy Initial Comments at 1 (identifying these use cases as the "two key long-term objectives" for hosting capacity analysis); DOC Initial Comments at 10 ("[T]o the greatest extent practicable, the foundational elements, assumptions, methodological design, and threshold values used in the HCA should match those used in the more technical processes used to actually integrate DERs and used for long-term distribution system planning.").

<sup>8</sup> Fresh Energy Initial Comments at 3; *see also* Minn. Stat. § 216B.2425 subd. 8 (requiring Xcel to "identify interconnection points on [Xcel's] distribution system for small-scale distributed generation resources and . . . identify necessary distribution upgrades to support the continued development of distributed generation resources.").

<sup>9</sup> Minn. Pub. Utils. Comm'n, Order Setting Additional Requirements for Xcel's 2017 Hosting Capacity Report at 5, Dkt. E-002/M-15-962(Aug. 1, 2017).

<sup>10</sup> EPRI's latest paper (discussed further on page 6) indicates that EPRI does not currently believe hosting capacity can be used to replace any of the technical screens used to expedite interconnection. Rather, EPRI suggests it can only be used "inform the assessment" of the engineer during the supplemental review process. Electric Power Research Institute, *Impact Factors, Methods, and Considerations for Calculating and Applying Hosting Capacity* at 4-3 (Feb. 2018) ("EPRI Report"). This conclusion is particularly troubling and is at odds with the conclusions that have been reached by the California utilities and the Hawaiian Electric

As discussed in IREC’s initial comments, a working group process or workshop(s) led by a neutral facilitator could be a useful vehicle for elaborating the hosting capacity use cases and their methodological needs.<sup>11</sup> Ideally, Xcel (and potentially other utilities) would be actively engaged in the process along with other interested stakeholders, creating the opportunity for dialogue and learning, and preferably consensus recommendations.<sup>12</sup> In addition to streamlining interconnection and improving distribution planning, participants could explore additional use cases for the hosting capacity analysis, such as its role in identifying the locational value of solar and other DERs, as DOC and PSC suggest.<sup>13</sup> IREC also supports DOC’s recommendation that Xcel provide more detail on mitigation options to increase the hosting capacity for individual feeders, such as information on costs of potential mitigations and the amount of additional hosting capacity they would be expected to produce.<sup>14</sup> For this information to be useful, it ultimately should be able to be provided on a site-specific basis to further planning efforts. IREC

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Companies (HECO), all of whom see a role for hosting capacity in expediting the screening process. *See, e.g.* PG&E Integration Capacity Analysis Final Working Group Report at 8-9, Cal. Pub. Utils. Comm’n Dkt. R. 14-08-013 (March 15, 2017); Final Statement of Position of the Hawaiian Electric Companies at 27-33, Haw. Pub. Utils. Comm’n Dkt. 2014-0192 (June 29, 2015); Interim Statement of Position of the Hawaiian Electric Companies, Ex. C at 4, Haw. Pub. Utils. Comm’n Dkt. 2014-0192 (Aug. 14, 2017). It is notable that none of these utilities utilize the DRIVE tool, and it is unclear if EPRI’s conclusion is specific to DRIVE or if EPRI believes no method could supplant the screening process.

<sup>11</sup> IREC Initial Comments at 13 (referencing California’s Integration Capacity Analysis (ICA) working group, in which IREC is participating).

<sup>12</sup> *See also* Sky Stanfield & Stephanie Safdi, *Optimizing the Grid: A Regulator’s Guide to Hosting Capacity Analyses for Distributed Energy Resources* at 25-27, Interstate Renewable Energy Council, Inc. (Dec. 2017) (“Optimizing the Grid”) (reviewing best practices for stakeholder engagement in development of hosting capacity analyses).

<sup>13</sup> DOC Initial Comments at 13; PSC Report at 12. As noted by PSC, this concept is being considered by a distinct working group in California dedicated to that state’s “locational net benefits analysis” (LNBA). Reports by the California LNBA Working Group as well as the ICA Working Group in Docket R.14-08-013 are available at <https://drpwwg.org/sample-page/drp/>.

<sup>14</sup> DOC Initial Comments at 12.

likewise agrees with DOC that hosting capacity analysis may be “useful to other regulatory processes” beyond distribution system planning.<sup>15</sup> Along these lines, the California Integration Capacity Analysis (ICA) working group is currently exploring the use of hosting capacity analysis for policy scenario analysis, such as in helping the Commission and stakeholders identify the likely impacts to the grid of proposed electric vehicle tariffs.<sup>16</sup>

**B. REQUIRE XCEL TO CONDUCT MORE RIGOROUS TESTING AND PROVIDE FURTHER DETAIL ON ITS METHODOLOGY AND UNDERLYING ASSUMPTIONS AND TO EITHER IMPROVE THE METHODOLOGY OR EXPLORE AN ALTERNATIVE ONE**

The hosting capacity methodology that Xcel deploys must be suited to fulfill the use cases identified by the Commission. IREC agrees with DOC that “to the greatest extent practicable, the foundational elements, assumptions, methodological design, and threshold values used in the HCA should match those used in the more technical processes used to actually integrate DERs and used for long-term distribution system planning.”<sup>17</sup> To that end, greater transparency is needed into the DRIVE methodology and the underlying assumptions in Xcel’s model as well as more rigorous analysis of the accuracy of its results. And improvements either need to be made or an alternative methodology adopted to generate results that are sufficiently accurate and reliable for interconnection streamlining, improving distribution system planning, and any other identified use cases.

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<sup>15</sup> DOC Initial Comments at 13.

<sup>16</sup> See Comments of the Interstate Renewable Energy Council, Inc. on January 24, 2018 Joint Amended Scoping Memo and Ruling, Cal. Pubs. Utils. Comm’n Dkt. R. 14-08-013 (Feb. 16, 2018) (discussing scope of the proposed policy scenario analysis use case).

<sup>17</sup> DOC Initial Comments at 10.

IREC shares PSC’s concern with the lack of transparency in the DRIVE methodology.<sup>18</sup> IREC agrees that transparency is critical to, among other things, building stakeholder confidence, creating a tool that meets intended use cases, and helping developers design DER projects to fall within technical limits. IREC also agrees that results should be fully replicable, which would in turn require ready access to the hosting capacity methodology itself.<sup>19</sup> Such access is thwarted, however, by the high price tag attached to EPRI’s publications detailing technical aspects of the DRIVE methodology. In addition to the \$10,000 EPRI paper PSC cites,<sup>20</sup> the 2017 EPRI report that Xcel relies on in its response to Staff Information Request No. 1 costs \$50,000 to download.<sup>21</sup> With price tags like these, it is challenging for any non-utility stakeholder, or the Commission itself, to gain access to the very important technical details underlying the methodology used by Xcel.

IREC also notes that EPRI recently released a report, *Impact Factors, Methods, and Considerations for Calculating and Applying Hosting Capacity* (Feb. 2018), which provides some limited additional insight into the DRIVE tool.<sup>22</sup> While aspects of the report are instructive, IREC encourages that Commission to treat its comparison of the DRIVE tool to other hosting capacity methodologies critically. The paper does not appear to have been peer-reviewed,

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<sup>18</sup> PSC Report at 4-5.

<sup>19</sup> *Id.* at 4.

<sup>20</sup> *Id.*

<sup>21</sup> EPRI, *Distribution Planning with Distributed Energy Resources: System wide Assessment—Final Collaborative Report* (Oct. 31, 2017), <https://www.epri.com/#/pages/product/000000003002010356/>

<sup>22</sup> EPRI Report at 3-16 – 3-22.

generally lacks citation to sources other than EPRI's own reports, and appears to mischaracterize information from other sources.<sup>23</sup>

### **1. Require More Rigorous Testing to Assess Accuracy**

Although IREC appreciates Xcel's initial accuracy assessment, IREC agrees with Fresh Energy and DOC that more rigorous analysis of the accuracy of Xcel's hosting capacity results is required. As Fresh Energy states, "[f]or the tool to be useful and this effort worthwhile, the results must be valid and trusted."<sup>24</sup> This is true for Xcel's current use of hosting capacity to guide DER customers to optimal interconnection locations, and it is particularly important if the analysis is used to streamline interconnection, by replacing interconnection screens, and to steer the utility's grid investment and other planning decisions.<sup>25</sup> IREC agrees with DOC that Xcel's "elect[ion] to pursue a streamlined method using the EPRI DRIVE tool" in lieu of a more precise approach like the iterative method makes it "even more essential that this first-pass analysis yield insight into the distribution system that is useful for stakeholders at all levels of distribution system planning and in order to meet the general goals of the hosting capacity analysis laid out by the Commission."<sup>26</sup> IREC also concurs with Fresh Energy that "a much more complete

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<sup>23</sup> For example, Table 3-3 on page 3-14 shows that the computational times for the iterative method from three of the California utilities varied from 0.5 hours/feeder up to 27 hours/feeder. Yet EPRI later states at page 3-26, that the "complete implementation of the CA ICA iterative analysis took an average of 27 hours per feeder" without noting that was only the case for SDG&E or acknowledging that SDG&E utilized a laptop computer to conduct the analysis, thus leading to a much longer run time for each feeder.

<sup>24</sup> Fresh Energy Initial Comments at 4.

<sup>25</sup> See DOC Initial Comments at 12 ("Improving the accuracy of the HCA is essential for a utility's distribution planning process.").

<sup>26</sup> *Id.*



accuracy analysis [should] be required, with sufficient data and transparent results with the goal of tracking continued improvement.”<sup>27</sup>

To this end, IREC recommends that the Commission adopt a two-pronged approach to guiding Xcel’s accuracy assessment. First, IREC agrees with DOC that, if Xcel continues comparing its hosting capacity values to results from interconnection screens and studies, it should expand the number of feeders used for the comparison and ensure that those feeders are a representative sample of the feeders on its distribution system.<sup>28</sup> As discussed in IREC’s initial comments, Xcel should also identify deviations of any kind from actual hosting capacity values—whether in a more or less conservative direction—so that stakeholders can understand the frequency and magnitude of discrepancies.<sup>29</sup>

Second, IREC recommends that a more robust accuracy analysis should be undertaken, beyond relying on interconnection screening and study results. Like DOC, IREC suggests that Xcel conduct a comparison on representative test circuits of DRIVE-based results with the results of an iterative method, which uses power flow simulations to more directly measure the actual technical capacity of the system.<sup>30</sup> EPRI’s recent paper reports that San Diego Gas & Electric Company in California has undertaken a version of this comparative analysis—comparing the iterative method to the EPRI DRIVE method on five of the utility’s feeders—though the results are yet to be published.<sup>31</sup> The three large California utilities, under direction

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<sup>27</sup> Fresh Energy Initial Comments at 5.

<sup>28</sup> See DOC Initial Comments at 11; see also Fresh Energy Initial Comments at 4 (suggesting that Xcel could have “cast a wider net” upon “concluding that [its comparison] method would result in a very limited sample size of only 15 feeders”).

<sup>29</sup> See IREC Initial Comments at 11.

<sup>30</sup> See DOC Initial Comments at 11; PSC Report at 4 (explaining that “iterative power flow approaches are slower but yield more accurate solutions”).

<sup>31</sup> See EPRI Report at 3-27.

by the California Public Utilities Commission, have also compared the results from streamlined and iterative methodologies on urban and rural demonstration circuits in their respective distribution service territories and on a single test circuit.<sup>32</sup> These experiences show that a comparison by Xcel of its DRIVE-based results with iterative results would be both feasible and highly instructive. In California, the comparison of the iterative and streamlined methods led the Public Utilities Commission to select the iterative method for the interconnection use case and revealed areas in which the tool could be refined and improved.<sup>33</sup>

Finally, IREC and Fresh Energy also share concern with the “surprising number of feeders with no available hosting capacity.”<sup>34</sup> Both parties urge the Commission to require Xcel to evaluate the accuracy of these zero-capacity results and to explain the reasons for these outcomes (e.g., whether they are due to a limitation in Xcel’s hosting capacity methodology, pre-existing constraints on the system such as high or low voltage, the presence of distributed generation facilities such as community solar gardens, and/or some other factor).

## **2. Require More Detailed Accounting of and Justification for Assumptions and Limitations of DRIVE Model**

While the details provided in Xcel’s 2017 report and responses to the Commission’s information requests have increased transparency, the commenting parties agree that more information and justification regarding the DRIVE model and its underlying assumptions are needed. Among the key areas for which information deficits exist and modifications to the model may need to be made are the following:

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<sup>32</sup> See *Optimizing the Grid* at 32-35 (reviewing the California demonstration projects and their results).

<sup>33</sup> See *id.* at 33-34; Cal. Pub. Utils. Comm’n, Decision on Track 1 Demonstration Projects at 29-33, Dkt. R. 14-08-013 (Oct. 6, 2017).

<sup>34</sup> Fresh Energy Initial Comments at 7; see also IREC Initial Comments at 23.

- *Load profile assumptions:* Fresh Energy, DOC, and IREC all request additional detail on the load curves and load profile assumptions that Xcel uses in its hosting capacity analysis.<sup>35</sup> IREC and Fresh Energy share particular concern with Xcel’s continued reliance on a conservative 20% of peak load assumption for calculating daytime minimum load rather than actual minimum load data from its SCADA system or some other source.<sup>36</sup> EPRI has also reported that additional loading levels beyond peak and minimum load could be input into the model to provide a time-based hosting capacity.<sup>37</sup> Like PSC, IREC recommends that Xcel assess whether introducing additional load data points into the model would increase the accuracy of the results.<sup>38</sup>
- *Large Centralized DRIVE scenario:* Because Xcel’s distribution system contains a mix of DER types, IREC supports Fresh Energy’s suggestion that Xcel conduct a sensitivity analysis to show the impact of the Large Centralized scenario by, for instance, comparing the hosting capacity results to those produced by running a large distributed DER scenario.<sup>39</sup> IREC also supports PSC’s suggestion that Xcel provide results in future reports using the Small Distributed scenario as well as the Large Centralized scenario, as the growth in penetration of small DER projects may well outpace large ones.<sup>40</sup> For this reason, IREC additionally requests explanation of whether and when the DRIVE tool could be modified to reflect the actual mix of DERs on Xcel’s system.<sup>41</sup>
- *Inadequate accounting for energy storage:* IREC, DOC, and PSC share concern that Xcel’s method accounts for energy storage only as a source of power but not as a source of load, which is an essential operating characteristic of the technology.<sup>42</sup> As PSC comments, “Xcel’s definition of DER is relatively narrow” and “would not address the effects of possible rapid growth in domestic battery storage and electric vehicles.”<sup>43</sup> IREC agrees that “development of the tool to include storage acting as load or as a substitute for transmission resources will be

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<sup>35</sup> See, e.g., DOC Initial Comments at 10.

<sup>36</sup> Fresh Energy Initial Comments at 9-11; IREC Initial Comments at 24-25.

<sup>37</sup> EPRI Report at 3-17.

<sup>38</sup> See PSC Report at 13.

<sup>39</sup> Fresh Energy Initial Comments at 7.

<sup>40</sup> PSC Report at 4-5, 13.

<sup>41</sup> At present, the tool appears to permit consideration of either centralized or distributed DER locations but not a blend of these allocations. See EPRI Report at 3-18.

<sup>42</sup> See IREC Initial Comments at 20-21; DOC Initial Comments at 14; PSC Report at 3-4, 10-11, 13; see also Xcel Energy, Distribution System/Hosting Capacity Study at 3, 6-7, Dkt. E002-M-17-777 (Nov. 1, 2017) (“Xcel Hosting Capacity Report”); Response to Information Request 1 at 8 (acknowledging that Xcel “did not determine thermal for load”).

<sup>43</sup> PSC Report at 4.

necessary to fully capture the impact of this technology.”<sup>44</sup> To this end, IREC supports PSC’s recommendation to “[w]iden the type of DERs considered” to include storage<sup>45</sup> and DOC’s recommendation that Xcel explain whether and how the DRIVE tool can be modified to model storage as load.<sup>46</sup> IREC notes that both the iterative and streamlined demoed by the California utilities possess this capability.<sup>47</sup>

- *0.98 leading power factor*: Xcel assumes a 0.98 leading power factor in DRIVE despite using a lower power factor, such as 0.95, in the detailed interconnection study process.<sup>48</sup> Because the choice of power factor can have a significant impact on results, IREC supports Fresh Energy’s suggestion that Xcel conduct a sensitivity analysis to show how much additional hosting capacity might be identified by aligning the power factor with that assumed in interconnection studies.<sup>49</sup> IREC is also concerned by EPRI’s statement in its recent report on the DRIVE methodology that “voltage regulation . . . is not part of the DRIVE algorithm.”<sup>50</sup> As smart inverter regulation functions become standardized, the inability to model their impact on hosting capacity may lead to unrealistically conservative results. IREC thus requests clarification on what advanced inverter functions Xcel and EPRI anticipate will be added to the DRIVE tool and when those modifications will be effected.<sup>51</sup> We support PSC’s recommendation that Xcel “[i]ncorporate more advanced inverter functions into the analysis, as they become available in the DRIVE tool.”<sup>52</sup>
- *Conductor spacing*: IREC and Fresh Energy share concern that Xcel assumes the same conductor spacing for each voltage class. As IREC noted in its initial

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<sup>44</sup> DOC Initial Comments at 14.

<sup>45</sup> PSC Report at 13.

<sup>46</sup> *Id.*

<sup>47</sup> *See, e.g.*, San Diego Gas & Electric Co. Demonstration Project A Final Report—Enhanced Integration Capacity Analysis at 29-30, Cal. Pub. Utils. Comm’n Dkt. R. 14-08-013 (Dec. 22, 2016) (explaining input of DER profiles that include generation and load); Cal. Pub. Utils. Comm’n, Decision on Track 1 Demonstration Project A (Integration Capacity Analysis) and B (Locational Net Benefits Analysis) at 3-4, R. 14-08-013 (Oct. 6, 2017) (ordering IOUs to release ICA values for uniform generation and uniform load when deploying the iterative methodology for interconnection streamlining use case).

<sup>48</sup> Response to Information Request No. 5 at 2.

<sup>49</sup> Fresh Energy Initial Comments at 7.

<sup>50</sup> EPRI Report at 3-20; *see also* Response to Information Request No. 1 at 9 (acknowledging that “[a]ctual protection settings are not examined”).

<sup>51</sup> Response to Information Request No. 5 at 2 (indicating that “EPRI has committed to expand [advanced inverter functions], where valuable, in future releases”).

<sup>52</sup> PSC Report at 13.

comments, a more detailed description of the actual conductor spacing in Xcel's distribution system would be helpful.<sup>53</sup> IREC also supports Fresh Energy's suggestion that Xcel conduct a sensitivity analysis to determine the impact on hosting capacity results of using actual conductor spacing for each voltage class.<sup>54</sup>

- *Head-End Voltage*: IREC supports Fresh Energy's recommendation that Xcel assess the impact of assuming a lower bus voltage than 104%, particularly if, as PSC comments, storage resources are fully modeled.<sup>55</sup> IREC adds that it would be helpful to assess whether the actual rather than assumed worst-case value could be input into the model based on SCADA data.<sup>56</sup>

### **3. Require Modifications to or Development of Alternative Hosting Capacity Methodology to Meet Use Cases**

As EPRI acknowledged in its recent report, “any assumption made will result in an estimate of hosting capacity” rather than a measurement of the actual technical capacity of the system.<sup>57</sup> It is thus critical to understand assumptions and their consequences for the accuracy of hosting capacity results. Many of these assumptions, such as a 20% minimum load heuristic and a higher leading power factor, may result in systematic underestimates of feeder hosting capacity. IREC thus urges the Commission to require Xcel to modify its tool, where possible, to eliminate assumptions that result in meaningful inaccuracies. IREC also agrees with DOC that “[i]f the EPRI DRIVE tool is not a sufficiently accurate method of determining the hosting capacity of the distribution grid, then remedial actions must be taken or alternatives must be considered.”<sup>58</sup>

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<sup>53</sup> IREC Initial Comments at 28-29.

<sup>54</sup> Fresh Energy Initial Comments at 7.

<sup>55</sup> *See id.*; PSC Report at 7.

<sup>56</sup> *See* IREC Initial Comments at 29.

<sup>57</sup> EPRI Report at 3-20.

<sup>58</sup> DOC Initial Comments at 11.

**C. REQUIRE XCEL TO IMPROVE ITS APPLICATION OF THE HOSTING CAPACITY TOOL, INCLUDING MORE FREQUENT UPDATING AND MORE GRANULAR MAPS AND DATA FILES**

Xcel's hosting capacity maps are an important innovation and key to providing customers with easily accessible information for identifying optimal grid locations to interconnect DERs. Ultimately, however, these maps are only as valuable as the accuracy and reliability of the underlying data. Any improvements to the hosting capacity methodology will increase the usefulness of this application. In addition, the commenting parties agree that modifications should be made to the deployment of the tool and release of the results to increase the value of Xcel's hosting capacity efforts. Stakeholders recommended two key sets of changes:

- *More frequent updating:* As EPRI acknowledged in its recent report, hosting capacity “[m]aps are a point-in-time representation of the hosting capacity.”<sup>59</sup> As grid conditions change and DERs are added to the system, maps grow stale and their usefulness diminishes. IREC agrees with EPRI that “[b]ecause of the constant change in the datasets being utilized and the use of maps, an appropriate refresh rate should be established for posting these maps.”<sup>60</sup> IREC continues to recommend that the Commission require Xcel to update its map and data on at least a monthly basis.<sup>61</sup>
- *Provision of more granular data, including through pop-up windows, data files, and enhanced feeder coloring:* IREC supports Fresh Energy's recommendation that the next iteration of Xcel's hosting capacity map include pop-up boxes with hosting capacity details, and that it be accompanied by downloadable data files with granular hosting capacity information and feeder load profiles with maximum and minimum load data.<sup>62</sup> IREC agrees with PSC that it would be helpful to add existing and queued DER information to these data files.<sup>63</sup> IREC also recommends that the maps show the actual calculated hosting capacity for each segment rather than only depict “significant levels of change.”<sup>64</sup> The data

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<sup>59</sup> EPRI Report at 4-2.

<sup>60</sup> *Id.*

<sup>61</sup> IREC Initial Comments at 13-14.

<sup>62</sup> Fresh Energy Initial Comments at 6; *see also* IREC Initial Comments at 14-17.

<sup>63</sup> PSC Report at 13.

<sup>64</sup> Response to Information Request No. 4 at 1; *see also* Xcel Hosting Capacity Report at 22.

files should also be provided in a sortable format that includes the hosting capacity for each feeder segment, which is necessary for the results to meaningfully inform customers about their interconnection options.<sup>65</sup> IREC further suggests that Xcel and the Commission consider whether it is appropriate to include buffer zones to hide route details for feeders, as these buffer zones are not included in California and New York's hosting capacity maps.<sup>66</sup> IREC supports DOC's suggestion that Xcel detail any impediments to publicly providing this more granular information.<sup>67</sup>

### III. CONCLUSION

IREC thanks Xcel and the Commission for their substantial efforts to create a valuable hosting capacity tool that will further the state's grid modernization and clean energy goals. IREC looks forward to continuing our engagement in this proceeding and in related discussions in Docket No. 15-556.

Respectfully submitted,

DATED: February 28, 2018

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<sup>65</sup> Response to Information Request No. 4 at 1. For an example of data files that provide data in more useful segments for potential interconnection customers, *see, e.g.*, Southern California Edison's Distribution Resource Plan Demo Results Library, available at <http://scedrpdemo2.azureedge.net/DRPDemo1.html> (showing hosting capacity for uniform generation and load by feeder segment and broken down by criteria violation).

<sup>66</sup> *See* PSC Report at 9.

<sup>67</sup> DOC Initial Comments at 10.

**CERTIFICATE OF SERVICE**

I, the undersigned, state that I am a citizen of the United States and am employed in the City and County of San Francisco; that I am over the age of eighteen (18) years and not a party to the within cause; and that my business address is 396 Hayes Street, San Francisco, CA 94102.

On February 28, 2018, I served a true and correct copy of

**REPLY COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC. ON XCEL'S 2017 DISTRIBUTION SYSTEM HOSTING CAPACITY REPORT**

on all parties as follows:

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**BY ELECTRONIC FILING:** I caused a copy of the document(s) to be sent to the e-mail addresses of the persons designated as accepting electronic service on the Official Service List by using the eService feature of the eFiling application of the Minnesota Public Utilities Commission.

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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed in San Francisco, California on February 28, 2018.

/s/ Amy Zehring

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Amy Zehring



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