STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

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August 21, 2017

In the Matter of the Commission Investigation into Grid Modernization: Focus on Distribution System Planning

Docket Number E999/CI-15-556

Initial Comments of Fresh Energy

Fresh Energy submits these initial comments in response to the Commission's April 26, 2017 Notice of Comment Period.

Overview

Distributed Energy Resources (DERs) offer tremendous potential customer benefits: as ICF International's Integrated Distribution Planning Report[1] (hereafter "the ICF Report") explains, "DER have the potential to provide incremental value for all customers through improving system efficiency, capital deferral and supporting wholesale and distribution operations."[2] Through proactive integrated distribution system planning, utilities can maximize the value of DERs and optimize distribution system investment, ensuring positive net benefits for all utility customers.

Xcel Energy also recognizes the transformative nature of DERs: "The technology advancements and customer and utility adoption of DER that is underway will require utilities to think and act differently about the ways they plan and operate their systems. […] [Distribution planning] is most certainly evolving to embrace a faster pace of change and to be more transparent and flexible in order to meet current and future customer and system needs."[3]

The current distribution system planning processes have served customers and utilities well, but they were designed for a different environment: steady, predictable load growth; very little

[1] ICF International, "Integrated Distribution Planning Report: Prepared for the Minnesota Public Utilities Commission," August 2016, filed in Docket 15-556 on September 13, 2016 (link).
[2] ICF Report, at page 16.
[3] Xcel Energy, Response to Notice, filed June 21, 2017 in Docket 15-556, at page 4 (link).

customer-sited generation; and relatively few alternatives when distribution upgrades were needed. This environment is undergoing rapid change: energy efficiency efforts—both within and outside of the utilities' control—are making demand forecasting more difficult; distributed generation is increasing, and is poised to expand rapidly; and there are new alternatives—such as battery storage and flexible demand response—to defer or avoid traditional utility investments. In this context, distribution system planning must evolve in order to find the most cost-effective solutions.

The Commission has made significant progress toward this end since it initiated its inquiry into grid modernization in May 2015: the Commission has held several informational workshops; Commission Staff and ICF International have written two excellent reports; the Commission is facilitating a working group to revise and improve upon the state rules for interconnection based on best practices; Xcel has performed the state's first hosting capacity analysis; and several utilities have filed detailed responses to the broad range of questions included in the Commission's April 26, 2017 Notice of Comment Period.

Thanks to the Commission's efforts, the public has dramatically more information about the state's utilities' distribution systems and planning processes than it did just two years ago. Fresh Energy applauds the Commission's efforts to date, and we appreciate all the work the utilities have done over the past two years.

This progress is perhaps best illustrated by the ICF Report's Integrated Distribution Planning Elements (pp 6-16):

1. Review Distribution System Status
2. Hosting Capacity
3. Multi-scenarios for distribution planning
4. Annual Long-term Distribution Planning
5. Interconnection Studies and Procedures
6. Integrated Resource, Transmission & Distribution Planning

Thanks to the Commission's and the utilities' efforts, significant progress has been made on many of these elements. The utilities' stakeholder meeting presentations and June 21, 2017 filings have provided detailed information on their current distribution system and their distribution planning practices. In separate dockets, the Commission is already taking action on two other elements: hosting capacity and interconnection.

In light of this progress, we believe the most reasonable near-term focus is Element 3: scenario planning for DERs. Below, we provide input on each of the Topics for comment in Section C of the notice.

Topic 1) Evaluation of utility plans

The first element in the ICF Report is a review of the current distribution system status, which provides a foundation for all other integrated distribution planning elements. The Commission's first stakeholder meeting in September 2015, with presentations from Dakota Electric, Minnesota Power, Otter Tail Power, Rochester Public Utilities, Xcel Energy on their respective distribution planning processes. The utilities' responses to the Commission's April 26, 2017 Notice of Comment Period provided even more detailed information. We appreciate these filings, which provided valuable insight into the current distribution system and planning processes.

We also appreciate Commission Staff's detailed questions in Section C.1. We believe they highlight many topics the will need consideration in the future. The Commission may not necessarily need to officially approve plans, but at a minimum in the near term it will be helpful in the near-term for the Commission and stakeholders to be more involved in the plans, especially in the development of the load forecasts and the scenario analyses. And the integration of distribution, transmission, and resource plans will be an extremely important topic as DER adoption increases.[4]

However, the Commission does not necessarily need to address these questions at this time. We believe it would be more productive at this point to focus on demand forecasts and DER scenario planning, as we discuss in Topics 3) and 4), below.

Topic 2) Feasibility of planning enhancements

Like many states, there is significant diversity in the service territories of the utilities across Minnesota. Even among the investor-owned utilities, there is considerable variation: the population density in Xcel's service territory is dramatically higher than Otter Tail Power's. Not surprisingly, there is also variation in the capabilities of their distribution systems: for example, Xcel has SCADA data on the substations serving over 90 percent of its customers, while Otter Tail has SCADA on less than 5% of its substations.[5]

The ICF Report argued (at page 20):

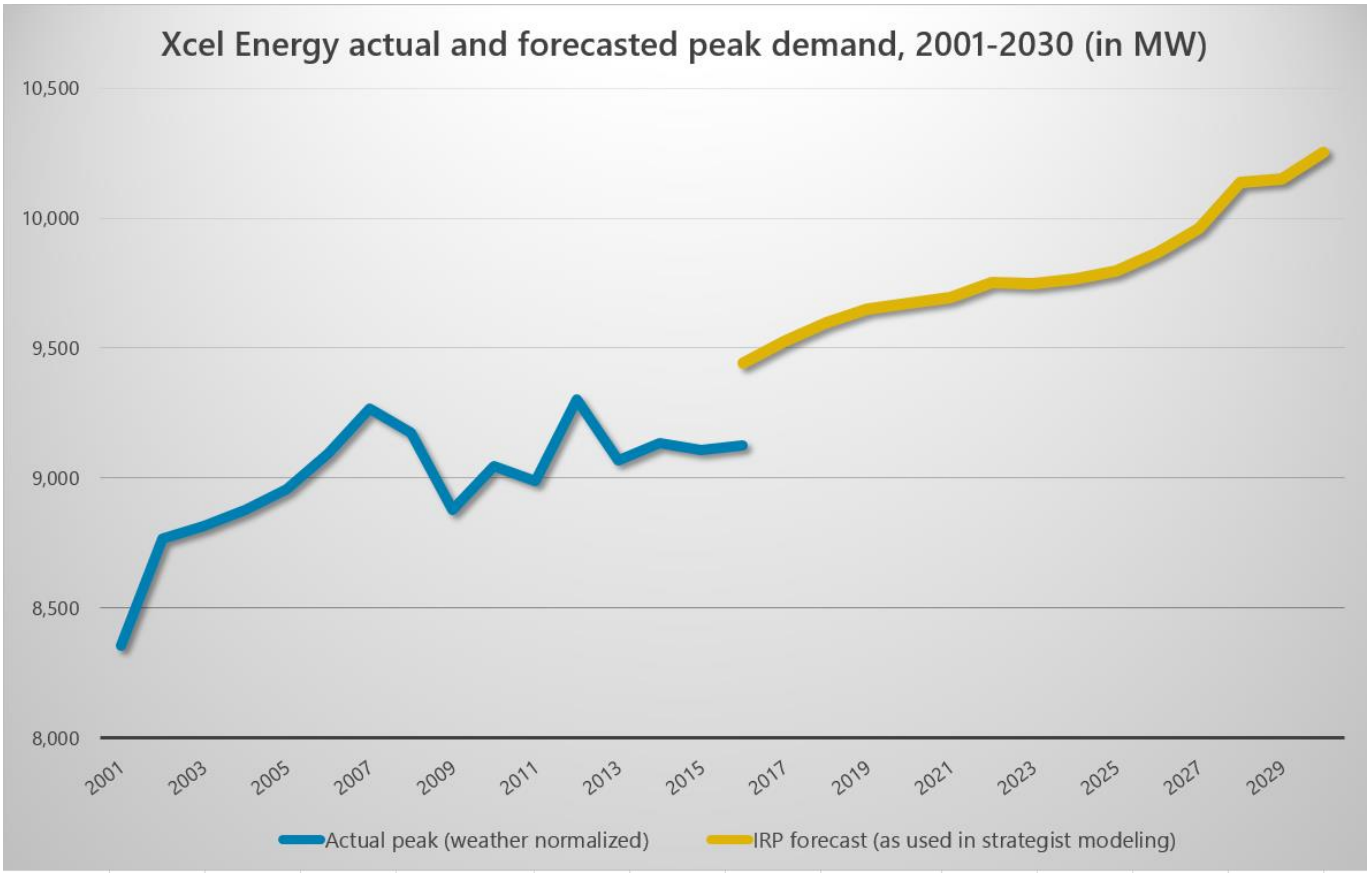
> [R]obust planning processes and engineering methods are required to advance distribution planning. However, while a consistent approach to distribution is highly desirable in Minnesota, it is necessary to allow for differences in tactical implementation in recognition of the type of utility and differences in local drivers for change, capabilities, service territory characteristics, and cost-effectiveness for each utility to ensure net benefits for customers.

[4] *See, e.g.*; Section 2.2.6 of the ICF Report.
[5] Xcel Response, at page 24; Otter Tail Power Sections A & B Comments, at page 3.

While we believe all utilities—and their customers—will benefit from integrated distribution system planning, we believe it is most appropriate to limit the Commission's near-term efforts to Xcel Energy, which has the most DER currently and will likely will the fastest DER growth in the near-term. However, eventually the Commission should extend its efforts to Otter Tail Power and Minnesota Power. We encourage these utilities to follow Xcel's progress closely, in order to take advantage of the knowledge gained from Xcel's experience.

Topic 3) Forecasting

Forecasts of demand growth are an integral part of distribution system planning. Under-estimating growth can put strain on the system and reduce asset life. Over-estimating growth can lead to premature and underutilized investments in distribution system upgrades, raising rates more than necessary.



Xcel's most recent integrated resource plan provides a clear example of why demand forecasts deserve close scrutiny. The graph above shows Xcel's actual peak demand from 2001-2015 along with the demand forecast Xcel used in its Strategist modeling in its 2015 integrated resource plan.[6] As the chart shows, Xcel's peak demand grew steadily from 2001-2007, with an

[6] Actual peak (2001-2015): Xcel Energy's response to PUC Information Request 33 in Docket 15-21, Table 1, page 2 (link). 2016 peak: Xcel Energy response to Fresh Energy Information Request #1 (attached). Forecast: Xcel Energy's 2016-2030 Upper Midwest Resource Plan, Table 1: Updated Load and Resources, page 12 (link)

average annual growth rate of 1.8%. Since the Great Recession, however, Xcel's peak demand has been flat, with 2015's weather-normalized peak 159 MW lower than 2007's. In spite of this actual experience, Xcel projected a 300 MW demand spike in 2016, and then an average annual growth of 0.6% from 2016-2030.

The discrepancy between Xcel's forecast and its actual observed demand is troubling. Much has changed since the 2001-2007 period: Xcel has spent hundreds of millions of dollars on its Electric Conservation Improvement Program, which has reduced their peak by hundreds of MWs[7]; Minnesota adopted new, more aggressive building codes statewide in 2015; the U.S. Environmental Protection Agency's ENERGY STAR program has ramped up consistently, saving more than 360 *billion* kWh in 2014 alone[8]; appliances and electronics have gotten much more energy efficient, and the maturation of LED light bulbs has dramatically reduced electricity consumption in the lighting sector. In short, electricity consumption has fundamentally changed over the past ten years, and Xcel's forecasts—at least as used in their Integrated Resource Plan—do not reflect this reality.

The forecasts provided in Xcel's Response appear to have the same problem. To be clear: forecasting for individual feeders is fundamentally different than the macro-level forecasting used in resource plans. Individual feeders may see significant load growth due to population or business expansions, even as total system demand stagnates. So, without more information on these individual feeders, we cannot comment on the accuracy of any specific forecast. However, *every single* forecast provided in Xcel's Response shows significant, consistent load growth in perpetuity. More importantly, the "conservative" forecasts appear to use the *exact same* growth rate; the projection simply starts from a lower value. This is an unreasonable methodology for a "conservative" load forecast, considering Xcel's flat system-wide demand growth.

This is concerning because these forecasts determine whether (and when) distribution system upgrades are made. If the forecasts systematically overestimate load growth, the utility will make investments sooner than necessary, unnecessarily increasing rates. Inaccurate forecasts could also lead the utility to not select the most cost-effective investment, as they may overestimate the magnitude of the upgrade needed.

The figure below—which Xcel provided as an example of a load forecast for a distribution feeder—illustrates this problem.[9] As the blue line shows, for much of 2004-2012, utilization was above the desired level. However, since 2013, utilization has been below the desired level.

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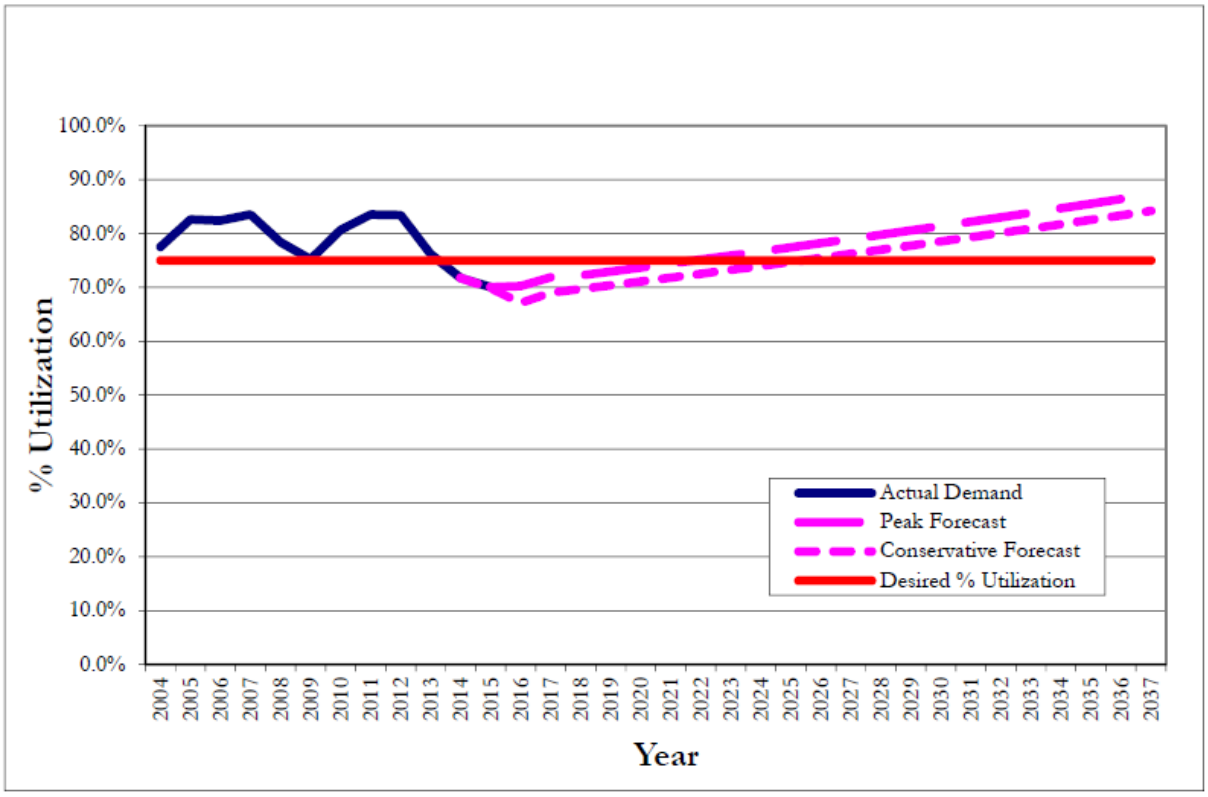
[7] Xcel's 2016 Status Report & Associated Compliance Filings, filed April 3, 2017 in Docket 12-447.09 (link). See, e.g. Figure 1, page 3, showing Xcel's CIP spending has reduced its peak demand by roughly 100 MW each year for the past 15 years.
[8] U.S. Environmental Protection Agency, "Climate Protection Partnerships 2014 Annual Report," at page 3 (link).
[9] Taken from page 12 of Xcel's June 21, 2017 Response.

This may be the new normal, as Xcel's system-wide demand has stagnated since 2007.[10] But, because Xcel's forecasts assume significant, consistent load growth, this may be identified as a project that would need upgrades in the near future. If peak load stays flat—as it has at the macro-level for Xcel's system since 2007—upgrades may not be necessary at all. And even if peak load does increase, but more slowly than forecast, targeted demand response (or some other combination of DER) could be used to defer the investment as it approaches the 75% utilization threshold.

Figure 5: Total Feeder Circuit Utilization – Historical Peak Demand and Peak Demand Forecast



Demand forecasts are an extremely important component of distribution system planning, and forecasting is becoming increasingly difficult. Accordingly, we believe these forecasts deserve additional attention going forward. In Topic 8, below, we outline a possible process to improve the forecasts used in Xcel's distribution planning.

Topic 4) DER scenarios

As discussed in Topic 9), technological advances and cost declines are making DERs increasingly attractive: solar and battery storage costs have fallen dramatically, electric vehicle growth is predicted to increase exponentially, and new hardware and software offerings are

[10] Again, there may be idiosyncratic issues on specific feeder forecasts, but we assume for the sake of argument that this feeder has no unique features that will drive higher load growth.

opening up new, more flexible and responsive demand response options. Xcel partially recognizes this in its Response, where the Company predicts nearly 500 MW of distributed solar generation will be added between now and 2020.[11]

In spite of these developments, none of the state's investor-owned utilities currently consider the impacts of DER growth in their planning forecasts.[12] Even though Xcel acknowledges that DER is expanding on its system, it still stated: "With the current limited levels of DER on the system, planning for the worst case scenario–or planning for the maximum annual peak sans DER–continues to be our standard method for ensuring a stable system."[13]

This approach should change. In order for Xcel's distribution planning process to identify the least-cost investments, load forecasts need to be as accurate as possible.

The ICF Report highlighted the importance of considering DER growth in distribution planning (at page 9):

> As DER adoption grows, the distribution system will increasingly exhibit variability of loading, voltage and other power characteristics that affect the reliability and quality of power delivery. As such, the uncertainty of the types, amount and pace of DER expansion make singular deterministic forecasts ineffective for long-term distribution investment planning horizons that often span from five to 10 years or more. A better approach is to use multiple DER growth scenarios to assess current system capabilities, identify incremental infrastructure requirements and enable analysis of the locational value of DERs.

Increased DER penetration is a significant enough development to merit additional attention. It may have been appropriate in the past for Xcel to not consider DER in its distribution planning, but with the DER additions that are coming to Xcel's system, its planning must evolve in order to identify the least-cost distribution investments. The ICF Report recommended considering three scenarios: a base case, lower DER adoption, and higher DER adoption. We believe this is an appropriate approach, and we recommend the Commission begin a process to develop appropriate levels for these three scenarios. We outline one possible approach in Topic 8) below.

Topic 5) Standards

Standards are the foundation for the modern grid. Adopting uniform, universally understood standards ensures both safety and interoperability. This spurs innovation and technological advancements, while also allowing competition to drive down costs.

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[11] Xcel Response, "Table 1: DER Deployment – State of Minnesota," Attachment B, page 2.
[12] *See*: the utilities' responses to question A 4)e.: on page 6 of Minnesota Power's filing, page 6 of Otter Tail Power's filing, and page 17 of Attachment A in Xcel's filing. Interestingly, Dakota Electric gave a much more detailed response to question A 4)e on pages 12-13 of its filing.
[13] Xcel Response, Appendix A, page 22.

There are a panoply of standards that are relevant to distribution system planning, including (this list is by no means exhaustive):

- IEEE 1547, 1547.1 (Standard for Interconnecting Distributed Resources with Electric Power Systems)
- IEEE 2030.5 (Smart Energy Profile 2.0 communications protocol)
- IEEE 1815 (Standard for Electric Power Systems Communications - Distributed Network Protocol or DNP3)
- UL 1741 and 1741-SA (Safety Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources)
- IEC 61850 (Reference Architecture for Electric Power Systems)
- OpenADR (Standard for open, non-proprietary demand response communications)
- Society of Automotive Engineers (SAE) J2954 (wireless charging), J2894 (power quality), and J3072 (EVs as distributed resource).

Topic 6) Access to grid and planning data by customers and third parties

Data accessibility is an integral part in distribution planning. Other states that are investigating distribution system planning—such as California and New York—have made a subset of the IOUs' planning data available for review by third parties. This is relevant not just for hosting capacity, but also when the utility is considering a distribution system investment that could be deferred or avoided through the strategic deployment of DERs.

In order for hosting capacity analyses to be useful to developers, they will require adequate data accessibility. As the ICF Report noted, hosting capacity analyses focus on three types of constraints: thermal, voltage/power quality, and protection limits, but, eventually, they will also "include a second step that considers how optimized locational adoption of DERs could enhance the hosting capacity."[14]

For investment deferral or avoidance, the type of data required will be project-specific, but could include things like: project location and deployment timelines, loading information, performance requirements (including specific primary or secondary grid needs the project will address), and the age of the equipment to be replaced and the capabilities of existing equipment that will remain.

We also appreciate Staff's question regarding unsuitable data transfers. In an increasingly digital world, some data—especially individual customer data and Critical Energy Infrastructure Information—is sensitive and needs to be protected. But while accessibility of grid and planning data is and will continue to be a very important topic, we do not believe the Commission needs to make any formal decisions on data availability at this time.

[14] ICF Report, at page 8.

Topic 7) Hosting Capacity

Hosting capacity analyses have the potential to inform the market by steering DER development toward those areas of the distribution grid that are able to accommodate interconnection requests with the least cost and/or to areas where the distribution grid could be improved upon by the addition of interconnected DERs. And, as the ICF Report notes, hosting capacity analyses can also be used to streamline interconnection studies and aid in long-term distribution planning.

The actual hosting capacity of a given circuit is constantly in flux, due to a changing application queue and regular upgrades to and reconfigurations of the distribution system. Accordingly, in the long-term hosting capacity analyses will be most beneficial to the utility and other stakeholders if 'refreshed' as often as resources and technology allow.

Fresh Energy has been an active participant in the Commission's ongoing inquiry into hosting capacity,[15] and we believe hosting capacity analysis has the potential to provide value for utilities, distributed energy developers, and customers. We have provided specific recommendations[16] in that docket to improve the functionality of Xcel's analyses, and we will continue to be active participants moving forward. We appreciate Xcel's and the Commission's work to date on this topic, and we look forward to Xcel's second hosting capacity analysis, which is to be published November.

Hosting capacity analyses are an essential component of integrated distribution planning. Eventually, the Commission will want to determine how best to merge Xcel's work in Docket 15-962 with Xcel's broader integrated distribution planning work. For the time being, however, it may be reasonable to continue addressing hosting capacity separately.

Topic 8) Strawman distribution planning processes

The Commission has made considerable progress since it initiated its inquiry into grid modernization two years ago, making headway on several of the Integrated Distribution Planning elements outlined in the ICF Report. We appreciate the work the Commission and utilities have done so far, and we believe there is value in continuing this process. The following recommendations provide a manageable path forward, allowing the Commission to

[15] Docket No. E002/M-15-962, *In the Matter of Xcel's Biennial Distribution Study Report – Hosting Capacity Analysis*

[16] Specifically, we recommended that Xcel: display the results, by feeder line section, using color-coded online maps; include "pop-up" windows to provide hosting capacity details for each node or line section; in addition to the color-coded maps, provide the hosting capacity analysis results in downloadable files, allowing customers and DER providers to perform analysis of the HCA results and to more easily identify DER opportunities and constraints; and provide downloadable feeder load profiles during peak and minimum load days to help customers and developers better understand circuit characteristics and associated DER opportunities and constraints. Additional detail, such as voltage, queued generation, and load profiles provide additional substantive benefit to a developer in the early stages of siting a project which results in further interconnection efficiency.

build on the foundation made to date while also respecting the existing workload of utilities, stakeholders, and regulators.

Narrowing the focus

Given the broad range of possible distribution planning topics that could be considered, we believe it is wise to narrow the near-term focus of this docket. Specifically, we recommend focusing on two topics: improving demand forecasts and incorporating DER adoption scenarios. And while the Commission would be justified in including Minnesota Power and Otter Tail Power, we recommend focusing initially on Xcel Energy.

In Topics 3) and 4) above, we outlined the shortcomings of Xcel's current practices for demand and DER forecasting. In light of the progress Xcel is making on hosting capacity (in Docket 15-962) and interconnection (in Docket 16-521), we believe improving demand and DER forecasting is the most appropriate next step. These topics are small enough to be developed concurrently with the hosting capacity and interconnection dockets while being important enough to provide considerable additional value by moving toward a more robust distribution planning process.

In Topic 2) above, we explained why we believe it is reasonable to focus initially on Xcel Energy, which has the most DER currently and will likely see the highest DER uptake in the near-term. While we believe there would also be value to improving Minnesota Power's and Otter Tail Power's demand and DER forecasts, in light of scarce regulatory resources and the comparably smaller DER adoption in their service territories, it may be more appropriate to begin with Xcel and later expand to Minnesota Power and Otter Tail Power.

Recommended procedural process

We recommend a three-step process to develop the record on these topics:

1) Require Xcel to make a compliance filing on demand and DER adoption forecasts;
2) Initiate a comment period to allow stakeholders to provide input on Xcel's filing; and
3) Designate a Lead Commissioner to facilitate record development and provide recommendations to the full Commission.

The process could begin with Xcel Energy submitting a compliance filing on its demand and DER adoption forecasts. This filing should include at least two components. First, it should describe Xcel's current demand forecasting practices, including a discussion of methodology used to determine the "conservative" forecast. The filing should discuss how Xcel has modified its methodology in light of the observed change in demand growth rates since 2007 and whether Xcel believes additional adjustments are necessary.

Second, in the compliance filing, Xcel should identify currently available DER forecasting tools and methodologies. These tools and methodologies should allow for the development of DER growth scenarios for baseline, low adoption, and high adoption scenarios to be included in Xcel's future annual distribution plans. The goal should be developing scenarios that could be incorporated into Xcel's comprehensive distribution planning analysis in the fourth quarter of 2018.

Following Xcel's compliance filing, there should be a written comment period to allow stakeholders to comment on Xcel's proposal and, if necessary, provide alternative recommendations for DER scenarios and demand forecasts. The Commission's grid modernization efforts to date have drawn considerable public interest: hundreds of people attended the Commission's fall 2015 stakeholder meetings, and the Commission has received written comments from 24 different parties, representing both national and local interests. It will be important to harness this enthusiasm and expertise in the development of the DER growth scenarios. We recommend a compliance filing deadline of 60 days from the date of the Commission's Order, with an initial comment deadline 30 days after the compliance filing, and a reply comment deadline 15 days after initial comments.

In light of the technical nature of these topics and the Commission's considerable workload, it may be appropriate to designate a Lead Commissioner to facilitate record development and provide a recommendation to the full Commission. Minn. Stat. §216A.03 Subd. 9 allows the Commission to designate a Lead Commissioner to facilitate record development and to provide recommendations to the full Commission.[17] Per the Statute, these recommendations would be "advisory only" and "not binding on the commission."

This topic is well-suited to the Lead Commissioner process. The issues are narrow—demand forecasts and appropriate DER forecasting methods and scenarios—and also technical in nature. The Lead Commissioner would be able to facilitate record development and could, if necessary, supplement written testimony with in-person stakeholder meetings. Once the record has been adequately developed, the Lead Commissioner could provide a summary and recommendations to help speed the deliberation of the full Commission at an agenda meeting.

With this process and timeline, it should be possible to develop DER scenarios and demand forecast improvements in time to be incorporated into Xcel's comprehensive distribution planning analysis in the fourth quarter of 2018. Signaling this intention at the outset will provide clear direction to Xcel and allow the utility ample time to prepare for the necessary adjustments. Once it has completed its 2018 plan, Xcel could submit a summary report. This would allow greater visibility into the planning process for the Commission and stakeholders

[17] The Commission employed this tactic recently in its January 24, 2017 Order in Docket 16-521 (link).

and would ensure that the Commission's direction on demand and DER forecasts is fully incorporated.

Topic 9) Other relevant distribution system planning issues and topics

We believe the overarching goal of integrated distribution planning should be the integration and optimization of DERs. DER expansion is coming whether we plan for it or not. Solar installation costs have fallen by 70% since 2010, and GTM Research predicts costs will fall by another 27% by 2022. Battery storage costs fell 77% between 2010 and 2016, and Tesla predicts the economies of scale of its under-construction Gigafactory will reduce costs by an additional 35%. Morgan Stanley now predicts demand for grid-scale battery storage will increase more than tenfold in just the next two to three years. When combined, solar and storage are even more compelling: Tucson Electric Power recently signed a PPA for a 100 MW solar array with a 30 MW storage system with a levelized cost of just 4.5¢ per kWh[18]; taking into account Minnesota's lesser solar resource, a similar project in Minnesota could be priced from 6.5 to 7.5 ¢ per-kWh.[19] Declining costs and new models will lead to over one million electric vehicles sold per-year in the U.S. by 2022, according to Bloomberg New Energy Finance. And new software and hardware options will open up new, more flexible and profitable demand response options.

These technologies will continue to advance and adoption will increase whether the Commission or utilities plan for them or not. But without guidance, DERs will not be directed to the locations on the grid where they would provide the most value, and customers may pay for unnecessary grid enhancements.

Through proactive planning and intervention, utilities and the Commission can optimize the deployment of DER, saving customers money while making the grid more resilient. As the ICF report argued, "[p]roliferation of DER holds the promise of enhancing the operational, environmental, and affordability of Minnesota's electric system,"[20] Xcel also noted that "using DER to potentially bridge the gap between an identified system issue may be more straightforward and save some time when compared to traditional alternatives, which can take between one and two years from the time of initiation to completion."[21] But in order to realize these benefits, we need "an integrated grid that optimizes the power system while providing safe, reliable, affordable, and environmentally responsible electricity."[22]

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[18] Business Wire, "TEP to Power 21,000 Homes with New Solar Array for Historically Low Price," May 22, 2017 (link).
[19] The solar component of Tucson Electric Power's PPA was "less than 3¢ per kWh," which suggests the storage component contributed roughly 2¢ to the PPA cost. In his January 18, 2017 presentation to the Minnesota House Job Growth & Energy Affordability Policy & Finance Committee, Xcel Energy President Chris Clark stated new utility scale solar prices in Minnesota are between $45-55 per MWh. This combined with Tuscon's estimated 2¢ per kWh cost of storage equals 6.5-7.5¢ per kWh.
[20] ICF report, at page 19.
[21] Xcel Response, at page 25 of Appendix A.
[22] ICF report, at page 19.

In short, when it comes to the distribution system, the key to a least-cost future is least-cost DER. We believe DER optimization should be the guiding objective moving forward.

Conclusion

We appreciate the opportunity to provide comments on these important issues. Specifically, we recommend the Commission:

- Require Xcel Energy to file, within 60 days of the Commission's Order, a report detailing:
    - Xcel's current demand forecasting practices for distribution system planning, including a description of methodology used to determine the "conservative" forecast. The filing should discuss how Xcel has modified its methodology in light of the observed change in demand growth rates since 2007 and whether Xcel believes additional adjustments are necessary.
    - The currently available DER forecasting tools and methodologies, with the goal of determining DER growth scenarios (baseline, low adoption, and high adoption) to be incorporated into Xcel's Q4 2018 distribution planning analysis.
- Initiate a comment period to allow stakeholders to provide input on Xcel's compliance filing and recommendations for DER scenarios and demand forecasts; and
- Designate a Lead Commissioner to facilitate record development and provide recommendations on DER scenarios and demand forecasts to the full Commission;

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Xcel Energy
Docket No.: E999/CI-15-556
Response To: Fresh Energy Information Request No. 1

Requestor: Andrew Twite
Date Received: July 26, 2017

Question:

Please provide Northern States Power's actual and weather normalized peak demand for each year from 2007 to 2016.

Response:

The requested information is provided in the following table.

Northern States Power Annual Peak Demand (MW)		
Year	Actual	Weather Normalized
2007	9,473	9,267
2008	8,694	9,173
2009	8,609	8,879
2010	9,131	9,021
2011	9,623	8,989
2012	9,475	9,237
2013	9,524	9,067
2014	8,848	9,133
2015	8,621	9,108
2016	9,002	9,124

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