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April 14, 2020

Via Electronic Filing

Mr. Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101-2147

**Re: AEMA's Petition Requesting a Miscellaneous Docket to Address Demand Response
Ordered in Docket No. E-002/RP-15-21**

Dear Mr. Seuffert:

The Advanced Energy Management Alliance ("AEMA") respectfully submits this Petition to the Minnesota Public Utilities Commission ("Commission") requesting that it open a miscellaneous docket to expedite Xcel Energy's implementation of 400 MW of incremental demand response ordered by the Minnesota Public Utilities Commission more than three years ago in Docket No. E-002/RP-15-21.

AEMA is sensitive to the Commission's operational changes and the challenges to public engagement due to the Covid-19 pandemic. As discussed in this Petition, Xcel Energy is at risk of noncompliance with a Commission order; therefore, AEMA submits this Petition while recognizing these extraordinary circumstances.

We have electronically filed this document with the Minnesota Public Utilities Commission, and copies have been served on the parties on the attached service list. Please contact me at ingrid@bjorklundlaw.com or 651-272-7487 if you have questions regarding this filing.

Sincerely,

/s/ Ingrid Bjorklund

Ingrid Bjorklund
Attorney for AEMA

Enclosures
cc: Service List

**STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION**

In the Matter of a Petition by AEMA to
Initiate a Proceeding to Adopt a Demand
Response Tariff to Comply with the
January 11, 2017 Order Approving Xcel
Energy's 2016-2030 Integrated Resource
Plan with Modifications and Establishing
Requirements for Future Resource Plan
Filings

Docket No. _____

SUMMARY OF PETITION

The Advanced Energy Management Alliance submits the attached Petition requesting that the Minnesota Public Utilities Commission ("Commission") initiate an expedited proceeding in the form of a miscellaneous docket to adopt a demand response tariff, or tariff revisions, to comply with the Commission's January 11, 2017 Order issued in Docket No. E-002/RP-15-21 that requires Xcel Energy to acquire no less than 400 MW of additional demand response by 2023. Demand response offers a flexible, cost-effective, customer-centric, and carbon-free resource. Noncompliance with the Commission's order is likely without a dedicated proceeding to develop demand response programs designed to add 400 MW of demand response by 2023.

**STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION**

In the Matter of a Petition by AEMA to
Initiate a Proceeding to Adopt a Demand
Response Tariff to Comply with the
January 11, 2017 Order Approving Xcel
Energy's 2016-2030 Integrated Resource
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Requirements for Future Resource Plan
Filings

Docket No. _____

**PETITION REQUESTING A MISCELLANEOUS DOCKET TO ADDRESS DEMAND
RESPONSE ORDERED IN DOCKET NO. E-002/RP-15-21**

I. Introduction

The Advanced Energy Management Alliance ("AEMA")¹ requests that the Minnesota Public Utilities Commission (the "Commission") initiate an expedited proceeding in the form of a miscellaneous docket to design demand response programs and adopt a tariff, or tariff revisions, to comply with the Commission's Order Approving Plan with Modifications and Establishing Requirements for Future Resource Plan Filings, issued January 11, 2017, in Docket No. E-002/RP-15-21 ("January 2017 IRP Order") that requires Xcel Energy ("Xcel") to acquire no less than 400 MW of additional demand response by 2023. Compliance with this order should not be delayed any further.

Consistent with the January 2017 IRP Order, Xcel included in its 2030-2034 Upper Midwest Integrated Resource Plan ("IRP"), Docket No. E002/RP-19-368, 400 MW of incremental

¹ AEMA is a trade association representing demand response and distributed energy resource aggregators and resource providers including platform companies, technology providers, and end use customers who commit to curtailing their operations when required. The views expressed in this petition are the views of the trade association and not of any one particular member.

demand response to be added by 2023.² Although Xcel stated it intends to comply with the January 2017 IRP Order, it has not made a good faith effort to comply other than including its Demand Response Action Plan in Appendix G1 of its IRP, filed on July 1, 2019. In this plan, Xcel states that demand response programs will need to be reviewed in forums prior to its ability to offer them to customers and suggests a miscellaneous or rate case filing for an interruptible tariff among other regulatory paths for various demand response programs.³ Yet AEMA is unaware of any action before the Commission to meet this requirement.

Moreover, Xcel's current IRP process is experiencing significant delays of well over a year.⁴ Xcel's original filing date was February 1, 2019. The Commission approved Xcel's recent extension request, and the new deadline for Xcel to file its supplemental information is May 15, 2020.⁵ The comment period will now close on November 16, 2020. Due to multiple delays and the enormity of issues to be addressed in Xcel's current and comprehensive IRP, a miscellaneous docket is the most appropriate vehicle to address how Xcel can achieve compliance with the Commission's January 2017 IRP Order. Intervention in Xcel's current IRP process is not practicable for stakeholders interested in shaping how Xcel will meet this mandate without substantial cost for participation. Parties in Xcel's IRP proceeding have expressed concern about the additional cost for advocacy due to delays in that process.⁶ Dedicating a separate docket to facilitate design of Xcel's demand response programs is the only option for timely compliance

² *In re Xcel Energy's 2020-2034 Upper Midwest Integrated Resource Plan*, MPUC Docket No. E002/RP-19-368, Xcel Initial IRP Filing at 13 (July 1, 2019).

³ *Id.*, Appendix G1—Demand Side Management at 16-17 (July 1, 2019).

⁴ *Id.*, Order Suspending Procedural Schedule and requiring Additional Filings at 5 (Nov. 12, 2019); *id.*, Revised Comment Period (December 6, 2019); *id.*, Notice of Suspended Comment Period (October 29, 2019).

⁵ *Id.*, Notice Approving Extension Request and Extending Comment Period (March 11, 2020). Due to disruption caused by the COVID-19 pandemic, Xcel recently filed another extension request to extend its supplemental filing to June 30, 2020.

⁶ These oral statements were made during the Commission's Agenda Meeting on October 17, 2019 addressing Docket No. E002/RP-19-368.

while allowing stakeholders the opportunity for full participation in the process—it is in the public interest.

II. Background

On January 11, 2017, the Commission ordered Xcel to acquire “no less than 400 MW of additional demand response by 2023.”⁷ The Commission distinguished this directive in Order No. 10 from its directive in Order No. 14(e) that required Xcel to provide a cost-effectiveness study of 1,000 MW of additional response by 2025.⁸ The Commission recognized that Xcel must maintain flexibility and consider a broad range of resource options in light of rapidly changing costs among potential energy and capacity resources.⁹ Commission staff noted in its briefing papers that “more demand response is not only achievable but economic”¹⁰

A. Lengthy Demand Response Stakeholder Process Did Not Result in Detailed Program Offerings

Given the directive by the Commission, Xcel was tasked with developing its demand response offerings to meet the Commission’s mandate of adding 400 MW by 2023. To facilitate development of its demand response programs, Xcel engaged the Great Plains Institute (“GPI”) and the Center for Energy and Environment (“CEE”) to lead stakeholder workgroup meetings to solicit input regarding the development of its demand response offerings to comply with the January 2017 IRP Order requiring Xcel to procure 400 MW of additional demand response by 2023 and to evaluate the cost-effectiveness of 1,000 MW of additional demand response by 2025.

⁷ *In re Xcel Energy’s 2016-2030 Integrated Resource Plan*, MPUC Docket No. E-002/RP-15-21, Order Approving Plan with Modifications and Establishing Requirements for Future Resource Plan Filings at 11 (Jan. 11, 2017). In its initial 2019 IRP filing, Xcel stated it understood the Commission sought to add cost-effective demand response, but the January 2017 IRP Order does not require the 400 MW to be cost-effective demand response. *In re Xcel Energy’s 2020-2034 Upper Midwest Integrated Resource Plan*, MPUC Docket No. E002/RP-19-368, Xcel Initial IRP Filing at 13 (July 1, 2019).

⁸ *In re Xcel Energy’s 2016-2030 Integrated Resource Plan*, MPUC Docket No. E-002/RP-15-21, Order Approving Plan with Modifications and Establishing Requirements for Future Resource Plan Filings at 10-11 (Jan. 11, 2017).

⁹ *Id.* at 10.

¹⁰ Staff Briefing Papers at 50 (Oct. 6, 2016).

The results were summarized in the attached report (the “GPI Stakeholder Report”) (Attachment A).¹¹

The GPI Stakeholder Report stated that “after the first two meetings, it became clear that it would be most valuable to focus stakeholder discussions specifically on the new or expanded demand response offerings that Xcel Energy could deploy to achieve compliance with the Commission’s order.”¹² As a result, the goals were revised to include:

1. Identify a set of consensus-based design characteristics for any new or expanded demand response program or portfolio of [sic] programs.
2. Understand and discuss the results of The Brattle Group’s demand response potential study in the context of the proposed design characteristics.
3. Apply the design characteristics to the list of Xcel Energy’s potential new and expanded demand response programs and identify which programs comport with the agreed-upon design characteristics.
4. Review and offer feedback to the demand response programs that Xcel Energy is developing to comply with the commission’s order, considering both the design principles and the results of the potential study.¹³

The stakeholder engagement effort was productive, with each meeting drawing dozens of participants. The active discussions led to the development of a set of demand response design principles and a set of filing objectives that should be met in any of Xcel’s demand response proposals. The design principles address what stakeholders prefer to see from a demand response portfolio of any size from Xcel. These principles are:

1. Compensate demand response appropriately given the specific benefits it provides.
2. Ensure pricing and expectations are clear, concise, and transparent for customers.
3. Provide flexibility and options for customers.¹⁴

¹¹ XCEL ENERGY DEMAND RESPONSE OFFERINGS: 2017-2019 STAKEHOLDER ENGAGEMENT PROCESS SUMMARY REPORT, GREAT PLAINS INSTITUTE and CENTER FOR ENERGY AND ENVIRONMENT (May 2019).

¹² *Id.* at 6.

¹³ *Id.*

¹⁴ *Id.* at 10.

The filing objectives address what stakeholders prefer to see when new or expanded demand response offerings from Xcel are filed with the Commission. These objectives are:

1. Be clear about the outcomes that demand response offerings are designed to achieve, and how those should be measured down the road.
2. Fully evaluate demand response program costs and benefits.
3. Address reliability and resilience of demand response offerings, as relevant.
4. Delineate between dispatchable and non-dispatchable demand response.
5. Show transparency towards meeting the objectives listed above.
6. Consideration of the AEMA/XLI Recommendations.¹⁵

These design principles and filing objectives reflect the consensus of the stakeholders. Despite stakeholders engaging in this process for more than a year, including participating in seven workgroup meetings, Xcel failed to present potential demand response program offerings in enough detail to gather feedback from the stakeholders other than the attached draft spreadsheet (Attachment B), which merely stated the title of the program in a specific category along with a brief description.¹⁶ As a result, stakeholders were unable to participate in a meaningful way, let alone reach consensus on potential demand response offerings that would be ready for approval in time for Xcel's 2019 IRP filing.

In summary, goals three and four of the stakeholder process were not met. The grim reality facing the Commission today is that unless these program offerings are approved soon, Xcel would be unable to achieve 400 MW of additional demand response by 2023 because it takes time for demand response programs to be fully subscribed.

¹⁵ *Id.* at 10-11 (referring to the joint recommendations of AEMA and Xcel Large Industrials).

¹⁶ A demand response matrix addressing demand response products in development as of January 2019 was provided by Xcel at the seventh stakeholder meeting facilitated by GPI and CEE on January 22, 2019.

III. The Time is Ripe for a Miscellaneous Docket

It has been over three years since the Commission issued its January 2017 IRP Order and no formal action has been taken thus far to add 400 MW of demand response by 2023. The deadline for compliance is now closer in time than the date the order was issued.

A. Xcel is at Serious Risk of Noncompliance

Xcel has not made a good faith effort to comply with the January 2017 IRP Order. It has not filed any new or expanded demand response offerings with the Commission since that order was issued. If Xcel's current IRP is not found to be complete¹⁷ until summer 2020, and new or expanded demand response programs are not implemented until after the Commission approves its IRP, the 2023 implementation deadline would not be met. It is simply not feasible for demand response programs to be developed or expanded, filed, approved, and marketed to and subscribed by customers in one year. Under these circumstances, AEMA is certain that demand response programs would not be subscribed in time for the winter 2023 period unless implementation occurs prior to the approval of Xcel's IRP. Xcel's Demand Response Action Plan includes "new programs that are dependent upon the regulatory process and customer acceptance."¹⁸ The table below is intended to serve as a potential timeline to develop and grow existing and new demand response programs under a dedicated miscellaneous docket that allows for public input to ensure Xcel's compliance. AEMA acknowledges this timeline is aggressive. Not only is the public input process aggressive, it takes time to expand sales and marketing activities, build customer pipelines,

¹⁷ Minn. R. 7843.0300, subd. 3.

¹⁸ *In re Xcel Energy's 2020-2034 Upper Midwest Integrated Resource Plan*, MPUC Docket No. E002/RP-19-368, Appendix G1—Demand Side Management at 15 (July 1, 2019).

and educate new customers.¹⁹ This sample timeline highlights the likelihood of noncompliance if action is delayed even further.

| Sample Timeline for Demand Response Implementation | Timeframe |
|---|-------------------|
| Further Program Development (e.g., continuation of workgroup and public comments) | Q3 - Q4 2020 |
| Xcel Program Filing(s) with Commission | Q1 2021 |
| Public Comment Period | Q1 - Q2 2021 |
| Commission Approval | Q2 2021 |
| Program Implementation | Q2 - Q3 2021 |
| Program Growth Ramp to 100MW | Q3 - Q4 2021 |
| Program Growth Ramp to 200MW | Q4 2021 - Q2 2022 |
| Program Growth Ramp to 400MW | Q2 2022 - Q1 2023 |

The Commission’s decision to require Xcel to acquire no less than 400 MW of additional demand response by 2023 was found to be reasonable and in the public interest. Since that ruling, demand response technologies have improved and have become even more cost-effective, customer acceptance has grown, and the reliability of the resource has been proven repeatedly. In the event the Commission revisits its January 2017 IRP Order, it would seem reasonable that the Commission would not eliminate its requirement. Moreover, Xcel acknowledged this resource will be in place by 2023 in its current IRP. There is no reasonable cause for delaying implementation of these demand response resources. Due to the length of time it takes to subscribe demand response programs, Xcel is at serious risk of noncompliance with the Commission’s January 2017 IRP Order.

Demand response has proven to be cost-effective in almost every jurisdiction in the U.S. Xcel presented a report to the GPI stakeholder workgroup from The Brattle Group showing robust amounts of cost-effective demand response.²⁰ In its January 2017 IRP Order, the Commission

¹⁹ AEMA has observed more aggressive growth within the first year of implementation when aggregators of retail customers are allowed to participate by leveraging existing customer relationships in other regions.

²⁰ RYAN HLEDIK ET. AL, THE BRATTLE GROUP, THE POTENTIAL FOR LOAD FLEXIBILITY IN XCEL ENERGY’S NORTHERN STATES POWER SERVICE TERRITORY (January 2019).

stated that acquiring 400 MW by 2023 was “supported by even the most conservative study of Xcel’s system in the record.”²¹ Given that Xcel included 400 MW of demand response in its IRP and improvements in technologies, costs, and customer acceptance have occurred since that time, the Commission should not allow Xcel to delay implementation until the conclusion of its current IRP proceeding, which would all but guarantee noncompliance.

B. Demand Response Offers Flexibility and Optionality

Demand response offers the Commission intangible option value while supporting the reliability of the grid. It can be used as both a short-term resource and a long-term resource. Demand response can provide Xcel with a resource that can be used and paid for only when needed.

Planning risks, siting risks, environmental risks, construction risks, implementation risks, legal and regulatory risks, and a host of other risks impose uncertainty about the timing and ultimate delivery of a conventional power plant. In a hypothetical example, if construction of a new power plant is deferred due to uncertainty, using demand response during that delay reduces the risk of generating stranded costs. If a plant is built and later determined to no longer be needed, ratepayers would be saddled with paying for the stranded asset for many years.

Drastic swings in demand due to unforeseen events, such as the current coronavirus crisis, highlight the value of flexible resources. Unlike an idle conventional power plant, many demand response resources such as large customer interruptible programs have no stranded costs. In the event a power plant unexpectedly went offline, demand response could be employed quickly to make up for that loss in supply. Additionally, demand response helps participating customers manage costs. AEMA understands that demand response cannot be used to meet all load.

²¹ *In re Xcel Energy’s 2016-2030 Integrated Resource Plan*, MPUC Docket No. E-002/RP-15-21, Order Approving Plan with Modifications and Establishing Requirements for Future Resource Plan Filings at 10 (Jan. 11, 2017).

Nevertheless, it can be used effectively and efficiently to manage reliability in the event of unexpected changes in load.

Demand response programs empower Xcel and the Commission with an option. Options increase in value with two variables: the time to expiration of the option and the volatility of the underlying resource. In the current case, demand response has an almost unlimited time horizon, and no matter how the underlying market is evaluated, the market is volatile. Environmental laws, technological change, and distributed resources, including on-site and grid scale technologies, are driving change in the utility industry at a pace that has not been seen in decades. Demand response enables Xcel and the Commission to buy time in order to understand the impacts of many of these changes, to delay major capital investments until uncertainty is minimized, and to protect the grid during times of uncertainty.

When assumptions about the future are volatile, flexible options become even more valuable. Demand response is an insurance policy against change and uncertainty. Further, the availability of demand response can stabilize prices, thereby making electricity more affordable. By fulfilling the Commission's mandate of 400 MW of demand response by 2023, a reliable and flexible resource would prove to be a valuable option.

C. A Miscellaneous Docket is in the Public Interest

AEMA is requesting that the Commission open a miscellaneous docket to direct implementation of one or more demand response programs to comply with the January 2017 IRP Order. A miscellaneous docket is the most appropriate type of proceeding to determine Xcel's demand response offerings and approve tariff revisions while allowing Xcel and stakeholders to focus on the design principles and filing objectives agreed to in the GPI stakeholder process

discussed above. Neither the IRP docket nor Xcel’s anticipated rate case would allow stakeholders to focus on the development of these offerings as effectively as a miscellaneous docket.

A miscellaneous docket proceeding is not a novel approach to address demand response implementation issues. This approach was used to address Minnesota Power’s proposed demand response offerings after it was ordered by the Commission to work with stakeholders to develop a demand response rider and corresponding methodology for cost recovery in its general rate case proceeding.²² The Commission recently issued its order on Minnesota Power’s proposed demand response offerings recognizing the important benefits of demand response and that the Midcontinent Independent System Operator is phasing in new demand response policies that would allow for “interruptions under a broader range of circumstances.”²³ The Commission also encouraged industrial customers and Minnesota Power to initiate discussions about opportunities for longer-term demand response resources by approving Product C after it declined to approve Product B.²⁴

In contrast to Minnesota Power, which was directed to develop a rider to attract more demand response participation, Xcel is required to achieve a specific level of demand response capacity within a specific timeframe. Coupled with the need identified in the January 2017 IRP Order and today’s environment requiring more flexibility, there is no reason 400 MW of additional demand response cannot be online by 2023. The GPI Stakeholder Report identified a set of consensus-based designed characteristics; thus, providing a head start in the development of expanded demand response program offerings. A miscellaneous proceeding is the next logical

²² *In re Application of Minnesota Power for Authority to Increase Rates for Electric Service in Minnesota*, MPUC Docket No. E-015/GR-16-664, Findings of Fact, Conclusions, and Order at 86, 115 (March 12, 2018).

²³ *Id.*, Order Granting in Part and Denying in Part Petition for Demand Response Tariffs at 11 (November 12, 2019).

²⁴ *Id.*

step where stakeholders can focus on the specific features of Xcel's demand response program offerings.

1. A miscellaneous docket would not impact the Commission's previous order address FERC Order 719.

To be clear, AEMA is not asking the Commission to reconsider its 2010 order with respect to FERC Order 719 by filing this Petition.²⁵ AEMA does not intend to seek reconsideration of that order. Rather, AEMA is interested in pursuing opportunities to work directly with utilities, including Xcel, which is allowed under that 2010 order.²⁶ AEMA is committed to facilitating broader customer access to the benefits of demand response across all customer classes. By addressing demand response in a miscellaneous docket, stakeholders can focus on developing Xcel's programs in a manner that minimizes performance risk and increases reliability. The record can be fully developed to ensure nondiscriminatory customer access to demand response products and sound risk management practices that protect both the utility and its customers.

IV. Conclusion

For the reasons herein, AEMA requests the Commission open and expedite a miscellaneous docket to adopt a demand response tariff, or tariff revisions, to accommodate and implement at least 400 MW of additional demand response by 2023 in accordance with the stakeholder guidance developed during the GPI stakeholder process. Without an expedited miscellaneous docket to address program design and corresponding tariff revisions, it would be virtually impossible for Xcel to comply with the January 2017 IRP Order.

²⁵ *In re Investigation of Whether the Commission Should Take Action on Demand Response Bid Directly into the MISO Markets by Aggregators of Retail Customers Under FERC Orders 719 and 719-A*, MPUC Docket No. E-999/CI-09-1449, Order Prohibiting Bidding of Demand Response into Organized Markets by Aggregators of Retail Customers and Requiring Further Filings by Utilities (May 18, 2010).

²⁶ *Id.* at 6.

V. Service List

AEMA served a copy of this filing on parties on the enclosed service list, which combine the service lists for Docket No. E-002/RP-15-21 and Docket No. E002/RP-19-368. Pursuant to Minn. R. 7829.0700, AEMA requests that the following persons be placed on the Commission's official service list for this proceeding:

Katherine Hamilton
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If you or your staff have any questions regarding this petition, please contact me at 651-272-7487.

Dated: April 14, 2020

Respectfully submitted,

/s/ Ingrid Bjorklund

Ingrid E. Bjorklund (Atty. No. 0350850)
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**ATTORNEY FOR THE ADVANCED
ENERGY MANAGEMENT ALLIANCE**

ATTACHMENT A

GPI Stakeholder Report



**GREAT PLAINS
INSTITUTE**



Center for Energy
and Environment

Xcel Energy Demand Response Offerings

2017-2019 Stakeholder Engagement Process Summary Report

MN PUC Docket No. E-002/RP-19-368

May 2019

Co-convened by the Great Plains Institute and Center for Energy and Environment

About this Report

AUTHOR

Trevor Drake, Great Plains Institute

ATTRIBUTION OF COMMENTS

This document provides a synthesis of remarks by stakeholders at seven meetings between December 2017 and January 2019. The notes do not indicate consensus among the group, but rather are meant to capture the collective discussion and key points raised by participants. No view should be attributed to any specific individual or organization.

The stakeholder engagement process and this resulting summary are intended to support, but not replace, important discussions within the formal regulatory process. Comments summarized as part of this report represent a perspective at a specific point in time and are not intended to limit the ability of any party to take any position in future regulatory proceedings.

ACKNOWLEDGEMENTS

GPI and CEE would like to thank Xcel Energy for the opportunity to serve as third-party facilitators for this stakeholder engagement process. We would also like to thank the stakeholders and speakers who attended and thoughtfully participated in the seven meetings that were convened as part of this process.

ABOUT THE CO-CONVENERS

Great Plains Institute: A nonpartisan, nonprofit, Great Plains Institute is transforming the energy system to benefit the economy and environment. For the last 20 years, the institute has worked on energy solutions that strengthen our communities, grow the economy, and improve lives while reducing emissions. More information is available at www.betterenergy.org

Center for Energy and Environment: The Center for Energy and Environment is a clean energy nonprofit with special expertise in energy efficiency that stretches back nearly 40 years. CEE provides a range of practical and cost-effective energy solutions for homes, businesses, and communities to strengthen the economy while improving the environment. More information is available at www.mncee.org

QUESTIONS ABOUT THIS REPORT

Questions should be directed to Trevor Drake, Great Plains Institute, 2801 21st Ave S, Suite 220, Minneapolis, MN 55407, tdrake@gpisd.net, 612-767-7291.

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I. Introduction

BACKGROUND ON DEMAND RESPONSE

Across the United States, profound changes are affecting the way that electric systems are being planned and operated. These changes include a shift away from power generation from large power plants towards greater deployment of variable, distributed electricity generation from wind and solar, increasing demand for electrified transportation and buildings, a desire for more consumer choice, and pressure to reduce carbon emissions and environmental impacts. Utilities, their regulators, and energy system stakeholders across the nation are grappling with how to address these changes and pressures while attending to the need to operate electric systems safely, reliably, and affordably.

Demand response encompasses a broad set of technologies and approaches that are used to modify customers' demand for electricity to provide system-level services. Demand response programs have the capabilities to help respond to many, if not all, of the profound changes and pressures affecting the electric system today. While demand response has historically been used to incentivize customers to curtail their demand for electricity during emergency events, it can also be used for other purposes, including enhancing overall reliability, reducing operations costs by deferring or avoiding infrastructure investments, shaping loads to accommodate variable electricity generation resources like wind and solar, providing choice to customers in how much they pay for electricity based on when they use it, and providing ancillary services such as frequency regulation.

Electric utilities across Minnesota already operate several demand response programs, ranging from interruptible tariffs that provide commercial and industrial customers a lower electricity rate in return for the ability to curtail demand during emergency events, to electrified home water heaters and air-conditioners that can be controlled by utilities to manage aggregated residential electricity loads across many customers at once.

DEMAND RESPONSE REQUIREMENT FOR XCEL ENERGY IN MINNESOTA

In its January 11, 2017 Order approving Xcel Energy's 2016-2030 Resource Plan, the Minnesota Public Utilities Commission required the electric utility to include in its next resource plan the procurement of 400 megawatts of additional demand response resources by 2023 and to evaluate the cost-effectiveness of 1,000 MW of additional demand response by 2025. In December 2017, Xcel Energy hired the Great Plains Institute (GPI) and Center for Energy and Environment (CEE) to convene stakeholder meetings to solicit input on the development of its demand response offerings towards achieving compliance with the Commission's order. Xcel Energy also hired The Brattle Group to conduct an updated demand response potential study including cost-effectiveness analysis, which became available near the end of the stakeholder engagement process.

This report summarizes key points of discussion and feedback received throughout the stakeholder engagement process, which took place across seven meetings from December 2017 to January 2019.

II. Process Overview

ORIGINAL PROCESS GOALS

Beginning in December 2017, Xcel Energy initially established the following goals to help guide the stakeholder engagement process that would be co-convened by GPI and CEE:

- Create a base understanding of demand response efforts in Minnesota compared to other areas of the nation.
- Discuss the scope of demand response efforts in Minnesota.
- Provide an opportunity to share ideas amongst stakeholders regarding demand response efforts within and outside Xcel Energy's service territory.
- Brainstorm new and updated program ideas for Xcel Energy's portfolio.
- Examine opportunities and challenges to new demand response technologies and any policy changes needed for success.

PROCESS REVISIONS

The above set of goals provided a helpful and broad starting point for stakeholder discussions. However, after the first two meetings, it became clear that it would be most valuable to focus stakeholder discussions specifically on the new or expanded demand response offerings that Xcel Energy could deploy to achieve compliance with the Commission's order. Therefore, after the second meeting, GPI, CEE, and Xcel Energy worked together to restructure the process around the following revised set of goals:

1. Identify a set of consensus-based design characteristics for any new or expanded demand response program or portfolio or programs.
2. Understand and discuss the results of The Brattle Group's demand response potential study in the context of the proposed design characteristics.
3. Apply the design characteristics to the list of Xcel Energy's potential new and expanded demand response programs and identify which programs comport with the agreed-upon design characteristics.
4. Review and offer feedback to the demand response programs that Xcel Energy is developing to comply with the commission's order, considering both the design principles and the results of the potential study.

This report details the group's progress in working to achieve these goals. Importantly, Xcel Energy stated to the group that their next Resource Plan will assume the additional demand response as required in the Commission's order, but that not all programs that will be deployed to achieve compliance would be fully developed by the time that the 2020-2034 Resource Plan is filed. Therefore, while the group did develop design characteristics—in the form of the Design Principles and Filing Objectives listed in this report—and discussed them with regard to Xcel Energy's proposed DR offerings, many of those offerings were still in development at the time of these meetings and could not be fully evaluated. Therefore, the Design Principles and Filing Objectives can be especially useful to provide ongoing guidance as those offerings are developed and proposed for approval.

TIMELINE AND MEETING TOPICS

Between December 2017 and January 2019, GPI and CEE convened a total of seven meetings, each covering the topics listed below. Meetings were held in-person in various locations in Minneapolis and St. Paul. Most meetings also allowed remote attendance when possible.

Meeting 1: Introduction to Demand Response

- Presentations:
 - Demand response 101 (Xcel Energy, The Brattle Group)
 - Regional transmission organizations and demand response (MISO)
 - Current utility demand response programs in Minnesota (Xcel Energy, Great River Energy)
- Discussion:
 - New demand response technologies and opportunities

Meeting 2: Demand response technologies and programs

- Presentations:
 - Current utility demand response programs in Minnesota (Otter Tail Power)
 - What XcelEnergy is currently exploring for new DR technologies and programs
- Discussions:
 - Q&A with MISO staff
 - Panel on DR technologies and programs, including enabling technologies, examples from other utility markets, and DR aggregators

Meeting 3: Demand response values, benefits, and challenges (April 2018)

- Presentation:
 - Demand response values and benefits (Xcel Energy)
- Discussions:
 - Stakeholder panel on demand response benefits and challenges (MN Department of Commerce, Citizens Utility Board, Fresh Energy)
 - What are stakeholders' objectives for Xcel Energy's additional DR offerings?

Meeting 4: Demand response cost-effectiveness; stakeholder guidance (May 2018)

- Presentation:
 - Evaluating demand response cost-effectiveness in resource planning (Xcel Energy)
- Discussion:

- What are stakeholders' design principles for Xcel Energy's additional DR offerings? (continued from Meeting 3)

Meeting 5: Demand response potential; distribution geo-targeting (August 2018)

- Presentations:
 - Demand response potential study preliminary results (The Brattle Group)
 - Demand response geo-targeting on the distribution system (Center for Energy and Environment)
- Discussion:
 - Exploring the preliminary results of the most recent demand response potential study

Meeting 6: Xcel Energy's draft demand response portfolio (August 2018)

- Presentation:
 - Draft portfolio of additional demand response offerings (Xcel Energy)
- Discussion:
 - Stakeholder feedback on Xcel Energy's draft portfolio

Meeting 7: Xcel Energy's proposed demand response programs (January 2019)

- Presentation:
 - Demand response potential study final results (The Brattle Group)
 - Proposed list of new and expanded demand response offerings (Xcel Energy)
 - Recommendations from Advanced Energy Management Alliance and Xcel Large Industrials to enable Xcel to achieve the Commission's mandate for incremental demand response in its service territory.
- Discussion:
 - Q&A on the final demand response potential study
 - Stakeholder feedback on Xcel Energy's new and expanded demand response offerings

PARTICIPATING ORGANIZATIONS

Meetings in this process were open to the public and noticed in MN PUC Docket No. E-002/RP-15-21. GPI also sent email invitations to a distribution list of parties that had expressed interest in Xcel Energy's demand response programs.

Meetings drew an average attendance of 30-40 individuals per meeting. GPI, CEE, and Xcel Energy would like to thank the following organizations for their participation in one or more (and in many cases, all) of the seven meetings. As noted above, comments summarized in this

document represent the collective insights of stakeholders who attended these meetings and should not be attributed to any specific organization or individual.

- MISO
- Advanced Energy Management Alliance
- Center for Energy and Environment
- Citizens Utility Board of Minnesota
- Fresh Energy
- Great River Energy
- Landis+Gyr
- LLS Resources, LLC
- Minnesota Department of Commerce
- Minnesota Municipal Utilities Association
- Minnesota Pollution Control Agency
- Minnesota Power
- Minnesota Public Utilities Commission
- MN Attorney General's Office
- MN Department of Commerce
- MN Pollution Control Agency
- NRG Curtailment Solutions, Inc.
- Otter Tail Power Company
- Rakon Energy LLC
- Stoel Rives, on behalf of the Xcel Large Industrials
- Strategen Consulting
- The Brattle Group
- The Mendota Group, LLC

MEETING MATERIALS

All meeting materials from this process, including agendas, slide decks, resources, documents developed for the group, and meeting notes are available online at <https://trello.com/b/vqrVwhQ3/xcel-energy-demand-response-workgroup>.

III. Design Principles and Filing Objectives

Demand response is a complex and wide-ranging topic. Demand response programs can be designed to offer services at the distribution and wholesale market level, engage every type of customer, and relate to or overlap with other program offerings including energy efficiency and time-varying rates. Given this complexity and the fact that Xcel Energy's demand response programs were still in development at the time these stakeholder convenings took place, GPI and CEE asked stakeholders to collaborate in developing a set of consensus-based principles that could provide guidance to any new or expanded demand response offering, allowing flexibility on behalf of Xcel Energy to design programs in consideration of the parameters set by stakeholders.

Stakeholders participating in this process developed two lists—Design Principles and Filing Objectives. The Design Principles provide guidance for designing demand response programs or portfolios of programs. The Filing Objectives describe what information stakeholders would like to see when new demand response offerings are presented for consideration to the appropriate regulatory body (the Minnesota Public Utilities Commission and/or the Minnesota Department of Commerce). These two lists are interrelated and therefore intended to be taken as a package. In other words, while all stakeholders may not have supported each of these objectives or principles on their own, they found the full set acceptable.

Importantly, these are meant to be general guidelines and not absolute requirements. Just because an offering arguably complies with these does not guarantee that stakeholders will

approve of it. These simply offer a starting point for developing demand response offerings that have a higher likelihood of earning stakeholder approval in the regulatory process.

DESIGN PRINCIPLES

What would stakeholders like to see from a demand response portfolio of any size from Xcel Energy in Minnesota?

- 1. Compensate demand response appropriately given the specific benefits it provides.**

Incentives and penalties should be informed by the underlying benefits and value streams that the program is intended to achieve. It's up to the utility to find the right incentive levels that will both elicit customer action and enable the desired benefits at a lower cost than other resource options.

- 2. Ensure pricing and expectations are clear, concise, and transparent for customers.**

The utility should make efforts to ensure that customers participating in DR programs understand the program rules.

- 3. Provide flexibility and options for customers.**

Demand response programs are ultimately made possible as a result of cooperation from customers. Therefore, it's important that the utility provides offerings that allow flexibility and options for customers with different needs, while also delivering the desired system benefits.

FILING OBJECTIVES:

What would need to be true to earn stakeholder support when new or expanded demand response offerings are filed with the Commission?

- 1. Be clear about the outcomes that demand response offerings are designed to achieve, and how those should be measured down the road.**

Outcomes addressed should include cost-effectiveness, customer engagement as participation, system reliability and flexibility, carbon reduction, resource integration, and avoidance of building new assets.

- 2. Fully evaluate demand response program costs and benefits.**

Costs and benefits should be evaluated from the perspective of multiple key actors affected by demand response programs, including the utility, DR participants, ratepayers who are not DR participants, and society at-large (e.g., including public policy related impacts such as greenhouse gas emissions). This evaluation should include consideration of alternatives to achieving the same benefits (e.g., if DR is being used to

address a system need, how do DR costs and benefits compare to those of whatever alternative might be used to meet that system need?).

Demand response programs can deliver several benefits, including the following: reducing peak loads; shifting loads from high-cost times to low-cost ones; shifting loads from periods with high greenhouse gas emissions to periods with lower emissions; beneficially adding new loads with attention to costs and emissions; reducing energy and capacity costs; and reducing the costs of necessary ancillary services including frequency regulation, spinning reserves, and supplement reserves. DR programs can achieve higher levels of cost effectiveness by ensuring that programs are enabling as many benefits as possible.

The costs and benefits being evaluated may depend on the particular regulatory pathway through which a new demand response program is proposed (e.g., programs being proposed as CIP offerings may be evaluated differently than those being proposed through a miscellaneous filing).

At least one stakeholder felt that the MISO capacity auction does not provide an accurate price signal for determining the cost-effectiveness of DR offerings and that the MISO-calculated CONE (cost of new entry) should be used as a proxy. Xcel Energy staff responded that DR offerings would need to compete with the company's individual CONE, which is being updated for the upcoming IRP and is expected to be lower than the MISO value due to the availability of many brownfield sites (as opposed to more expensive greenfield sites) for new CT's.¹

3. Address reliability and resilience of demand response offerings, as relevant.

Demand response proposals should include evidence to show how the proposed offerings will reliably deliver the intended benefits. This evidence could include physical testing, the deployment of incentives and penalties that can arguably elicit a response from customers, and audits to confirm that a program is reliably delivering its intended benefits when called upon. In cases of entirely new offerings where showing evidence of costs and benefits may not be possible, pilot projects could be deployed to develop the needed evidence.

4. Delineate between dispatchable and non-dispatchable demand response.

The group discussed the difference between “dispatchable” and “non-dispatchable” DR, but did not come to consensus on exact definitions for those terms. In general, this objectives asks Xcel Energy to differentiate between something like a time-of-use rate, which could be considered a DR offering but is arguably not dispatchable (i.e., it can't be called upon to reduce load in an emergency event), and something like critical peak pricing, which is arguably dispatchable to reduce load when needed. Some stakeholders questioned the extent to which non-dispatchable offerings qualify as demand response.

¹ Meeting 4 Notes, pages 3-4, available online at <https://trello.com/c/aNqgmBv4/4-meeting-4-dr-design-principles-objectives-and-cost-effectiveness-5-1-2018>

In addition, some stakeholders asked that Xcel Energy clarify which demand response offerings, and how much of those offerings, are accredited in MISO.

5. Show transparency towards meeting the objectives listed above.

For all of the filing objectives above, Xcel Energy is more likely to earn support from stakeholders by showing or explaining its efforts to meet these objectives as transparently as possible.

6. Consideration of the AEMA/XLI Recommendations

The Advanced Energy Management Alliance (AEMA), which represents the interests of demand response service providers, including aggregators and the end-use consumers who ultimately provide demand response resources, was one of the organizations that provided dedicated stakeholder participation to this process. AEMA partnered with Xcel Large Industrials (XLI), a group of Xcel's largest industrial customers who are represented in regulatory matters by the law firm Stoel Rives LLP, to develop a set of recommendations for what they would like to see reflected in Xcel Energy's DR offerings based on discussions during this process.

GPI and CEE, at the request of AEMA and XLI and with consent from Xcel Energy, distributed a document listing those recommendations in advance of the seventh meeting. Facilitators also allowed AEMA and XLI to present their recommendations to the group at that meeting.²

Most of the best practices that AEMA and XLI recommended were in alignment with the group's previously developed Design Principles and Filing Objectives, though their recommendations offered much more specific detail. The one best practice area that differed most notably from the group's Design Principles and Filing Objectives was in regard to the utility's use of third-party DR service providers.³ AEMA and XLI argue in their written proposal that demand response aggregators can offer services that benefit both customers and the utility, ultimately making DR programs more effective.⁴

The appropriate use of third parties to support Xcel Energy's demand response efforts was a theme that arose in several discussions throughout the stakeholder engagement process. and may be worth considering when new or expanded demand response offerings are proposed for approval.

² The recommendations document and associated slide deck from AEMA and XLI are available online at <https://trello.com/c/qvtfayfB/23-meeting-7-wrap-up-1-22-2019>

³ AEMA proposals mirror the "Indiana Model" for consumer and aggregator participation in DR programs. Under the Indiana model, aggregators act as an intermediary between the utility and the customer, bringing the customer's load drop capabilities to the utility, and the utility will then, if appropriate, register the load drop capabilities with the ISO. Under this approach, there is no infringement on the state's prior decisions under FERC order 719

⁴ Recommendations document at 3

IV. Demand Response Potential Study

BACKGROUND ON THE STUDY

To support both its own efforts to comply with the commission's requirement and stakeholder discussions under this process, Xcel Energy hired The Brattle Group to conduct a study of demand response potential in its Northern States Power (NSP) service territory.

The Brattle Group had conducted a previous study in 2014 that looked only at DR technical potential, which was the basis for the Commission's requirement. This more recent study looked beyond that technical potential, evaluating both cost-effective potential—in which demand response program costs, equipment costs, and incentives must outweigh avoided resource costs—and achievable potential, which estimated program enrollment rates based on local and national market research.

This new study sought to “estimate the potential capability of all cost-effective demand response (DR) that could be deployed in Xcel Energy's Northern States Power (NSP) service territory through 2030,” including mid-point analyses at the year 2023, which was the deadline for procuring 400 MW of additional DR as required by the Commission, and the year 2025, which was the commission's deadline for evaluating the cost-effective achievability of 1,000 MW of additional DR.⁵

The study included two scenarios for evaluating DR deployment under different sets of assumptions – a Base Case and a High Sensitivity Case. The study states, “The Base Case most closely aligns with NSP's expectations for future conditions on its system, as defined in its IRP. The Base Case represents a continuation of recent market trends, combined with information about known or planned developments during the planning horizon.”

By comparison, “The High Sensitivity Case was developed to illustrate how the value of DR can change under alternative future market conditions. The High Sensitivity Case is defined by assumptions about the future state of the NSP system and MISO market that are more favorable to DR program economics.”⁶ Importantly, the study notes that the High Sensitivity Case “is not a forecast of what is likely to happen in the future in NSP's service territory, particularly in the near-term years of the study horizon.”⁷

⁵ Ryan Hledik et al., *The Potential for Load Flexibility in Xcel Energy's Northern States Power Service Territory*, (The Brattle Group, January 2019), i, available online at <https://trello.com/c/qvtlayfB/23-meeting-7-wrap-up-1-22-2019>

⁶ Ibid, iv

⁷ Ibid, iv

INTERPRETING THE COMMISSION'S REQUIREMENT

Importantly, the study lists two clarifications around interpreting the commission's 400 MW requirement. The first is that there are three ways to measure demand response – at the capacity level, the generator level, and the meter level:

1 MW of load reduction at the meter (or customer premise) avoids more than 1 MW at the generator level due to line losses between the generator and the customer. Further, 1 MW of load reduction at the generator level provides more than 1 MW of full capacity-equivalent value, as the load reduction would also avoid the additional capacity associated with NSP's obligation to meet the planning reserve requirement. Based on NSP's calculations, which account for line losses and the reserve requirement, 1 MW of load reduction at the meter level equates to 1.08 MW of load reduction at the generator level and 1.11 MW of capacity-equivalent value.⁸

The report then states that while "NSP has interpreted the PUC's Order to require 400 MW of capacity-equivalent DR," the report itself assesses the commission's "procurement requirement as a 391 MW generator-level value unless otherwise specified."⁹ To be consistent, this section of the stakeholder process summary uses demand response capability values that align to the report's 391 MW generator-level interpretation of the commission's 400 MW requirement.

The second clarification is that the requirement set by the commission was established based the 2014 potential study, when Xcel Energy had 918 MW of demand response capability. Much of this newer study looks at incremental DR potential from a lower 2018 baseline of 850 MW of DR capability. This reduction in the baseline is due to program right-sizing that took place after 2014, in which customers on interruptible tariffs were tested to check their ability to comply with the requirements of those tariffs and subsequently removed from the tariffs if warranted.¹⁰

The effect of this baseline change from 2014 to 2018 is that in order to meet the commission's requirement, Xcel Energy must procure an additional 459 MW of generator-level DR from the 2018 baseline, adding up to a total generator-level demand response capability of 1,309 MW by 2023.

RESULTS AND STAKEHOLDER DISCUSSION

With regard to the commission's 2023 requirement, the study concluded that under the Base Case assumptions Xcel Energy could cost-effectively deploy 306 MW of additional generator-level demand response by 2023 from a 2018 baseline, falling short of the Commission's 459 MW requirement (adjusted from the original 400 MW value as noted above). This was partly due

⁸ Ibid, 17

⁹ Ibid, 17

¹⁰ Ibid, 18

to the assumption that advanced metering infrastructure (AMI) would not be fully deployed in 2023, an item that was of interest to stakeholders and is described in more detail below.

Beyond the 2023 deadline, the study found that, under the Base Case assumptions and with full AMI deployment in 2024, Xcel Energy could deploy “1,243 MW of cost-effective DR potential in 2025.”¹¹ This quantity would be close to, but still short of, the incremental 459 MW (1,309 MW total potential) requirement for 2023. Looking out to 2030, the Base Case assumptions yielded 468 MW of incremental cost-effective DR, adding up to a total portfolio 1,318 MW.¹²

Staff from The Brattle Group presented preliminary results from the study at Meeting 5 and final results at Meeting 7. While the opportunity to discuss the study during meetings was clearly valuable to stakeholders, it seemed to facilitators that more time could have been useful to understand the study results in-depth. To support ongoing conversation and complement the information contained in the study, we have described below the topics that appeared to be of most interest to stakeholders during Meetings 5 and 7, including examples of specific issues or questions that were raised.

Avoided capacity costs

In order for demand response to be cost effective in the study, the sum of its program, equipment, and customer incentive costs would have to outweigh the cost of an avoided resource. Therefore, the assumed cost of an avoided resource was of particular interest to stakeholders because it serves as a threshold that demand response must pass to be considered cost effective.

As noted above under Filing Objective 2, Xcel Energy’s cost of a new natural gas generation resource is significantly lower than national averages due to the availability of brownfield sites that reduce development costs for new turbines. This was a concern for some stakeholders. The study addresses this difference by looking at demand response potential under two different avoided capacity costs: Xcel Energy’s assumed cost in its 2018 integrated resource plan of \$64/kW-yr for the base case, and the U.S. Energy Information Administration’s 2018 Annual Energy Outlook assumed cost of \$93/kW-yr for the high sensitivity case.¹³

Cost-benefit analysis

In alignment with Filing Objective 2, many stakeholders wanted to better understand how the costs and benefits of demand response were analyzed in the study, in comparison to traditional forms of generation such as natural gas plants. In particular, some participants were interested in the assumptions around the operational constraints of

¹¹ Ibid, iii

¹² Ibid, iv

¹³ Ibid, 13

demand response programs (e.g., the ability to actually elicit the required response from customers when needed, with attention to the necessary frequency and duration of that response).

Staff from The Brattle Group responded that they analyzed demand response costs and benefits by taking Xcel Energy's assumed cost of providing capacity through traditional generation (e.g., \$63/kW-yr in the base case) and allocated that cost across the 100 hours of the year when electricity demand was most likely to be at its peak. This takes the annual avoided capacity cost and turns it into an hourly capacity cost that demand response must beat to be cost-effective in each of those hours. The Brattle Group's model then attempts to dispatch demand response in those hours instead of traditional generation, accounting for DR costs, operational constraints such as the inability to use air conditioning demand response programs in winter and additional values, such as deferral of transmission and distribution investments. Additional details of the cost benefit analysis are included in the study.

Incentive levels for existing program participants

One key clarification that arose through stakeholder discussion was that the study looked only at the costs to acquire *new* demand response program participants, either through entirely new programs or through the acquisition of new participants for existing programs. However, the study did not look at adjusting incentive levels or changing program designs for existing DR participants. Some stakeholders were concerned that so doing may have excluded potentially significant additional capacity of cost-effective DR and certainly excluded analysis of existing customer capacity beyond emergency-only interruptions. While any changes for existing program participants were outside the scope of this study, this issue may be worth considering as changes to existing demand response programs are proposed in the future.

Advanced metering infrastructure

Stakeholders were interested in how advanced metering infrastructure (AMI) was included in the potential study because it's a foundational technology that enables several demand response programs, including time-varying rates and critical peak pricing. With no residential advanced metering infrastructure currently deployed or planned other than for the residential time-of-use pilot that will commence in 2020, the study assumed that NSP would not achieve full AMI deployment until 2024. This was a factor in the study's finding that Xcel Energy could not cost-effectively achieve 459 MW of additional demand response by 2023 from a 2018 baseline.

Participants were also interested in assumptions around the costs of AMI. One of the challenges with addressing those costs is that AMI can be used to support many programs and services, demand response being only one of them, so it is difficult to assign a portion of the total investment in AMI to demand response programs alone. The Brattle Group staff explained that while AMI was assumed beginning in 2024, its costs were not included in the assessment of DR program costs.

The impact of this on the study is that programs that rely on AMI after 2024 may appear more cost effective than if a portion of the investment in AMI was included in their costs. Some stakeholders were interested in further discussing AMI investment costs, but

acknowledged that such a discussion might be better suited to a conversation outside of these demand response-specific meetings.

Transition from Saver's Switch to smart thermostats

In both Meeting 5 and Meeting 7, stakeholders were curious to know more about a shift that the study predicted between 2017 and 2023, in which current participants in the Saver's Switch program leave to become participants in smart thermostat programs. The Brattle Group staff explained that utility-controllable smart thermostats offer more sophisticated demand response controls over Saver's Switch, such as the ability to pre-cool spaces and coast through an event, rather than simply cycling A/C units during the event. Further, since the two programs control the same devices (i.e., A/C units), customers may not participate in both.

This transition between the two different technologies leads to a net increase of 114MW of demand response—roughly one third of the cost-effective demand response capacity that could be deployed before 2023.¹⁴ The Brattle Group staff also noted that while these programs are offered to residential, commercial, and industrial customers, most of the increase is due to residential customers buying smart thermostats.

Full consideration of value streams, including ancillary services

Participants were interested in finding out whether and how DR value streams beyond avoided capacity were analyzed, including transmission and distribution deferral and ancillary services such as frequency regulation. Staff from The Brattle Group explained that up to 2023, most of the value attributed to demand response comes from deferred capacity investments. However, the study's High Sensitivity Case looks at the value of additional benefits from ancillary services towards 2030, including a doubling of the need for frequency regulation as well as additional need for transmission and distribution deferral. Staff from The Brattle Group clarified that frequency regulation is the only ancillary service that was modeled because it provides the greatest value to demand response.

Full consideration of newer demand response programs

The Brattle Group's study considered eight new demand response program options, but found that only smart water heating could cost-effectively be deployed before 2023.¹⁵ Some stakeholders were interested in knowing more details about how these newer programs were considered. In particular, participants asked about behavioral demand response (in which customers receive non-monetary positive feedback for reducing their electricity usage in response to a notice) and heat pump space and water heating.

For behavioral demand response, which was not found to be cost effective under any of the cases modeled, The Brattle Group staff explained that they looked at studies and

¹⁴ This value was initially presented as 105 MW in Meeting 5 (Brattle deck slide 11) and was later updated to 114 MW in the final version of the potential study.

¹⁵ Hledik et al., Potential for Load Flexibility, 19-21

spoke with O-Power, a behavioral demand response service provider, to better understand the per-customer costs of running those programs. For heat pump space and water heating, the research team explained that they considered it, but didn't include it in the study for two reasons: first, that most of the benefits are efficiency rather than demand response; and second, that penetration of electric heat pumps is currently too low to warrant its inclusion, though that could change in the future. However, the study does include electric resistance water heaters, which currently have a more substantial market penetration.

V. Xcel Energy's Demand Response Offerings in Development

At the sixth stakeholder meeting in August 2018, Xcel Energy presented for feedback an initial list of demand response programs under development to meet the commission's requirement. This included eight residential DR programs, five programs for large commercial and industrial customers, and six programs for small/medium commercial and industrial customers.

INITIAL FEEDBACK

In response to the offerings presented at Meeting 6, stakeholders said that the list of programs seemed to strike a balance between traditional DR and forward-looking, innovative programs. They also said that Xcel Energy seemed to be looking at the right general buckets of opportunities. However, several stakeholders stated that they would need much more detail to be able to fully evaluate Xcel Energy's DR offerings. Below, we have summarized the general requests for more information that were raised during Meeting 6:

Contribution to Commission Requirement

The programs presented at Meeting 6 did not include estimated DR capabilities in terms of megawatts, so some stakeholders wanted to know how each program would contribute to the commission's requirement. As noted below, Xcel Energy provided initial estimates for these numbers in Meeting 7.

Cost-Effectiveness and Potential Study

Stakeholders desired to know more about the cost-effectiveness of each program being developed, and how that cost-effectiveness was derived, whether based on sensitivities in The Brattle Group's potential study or through another method. Some parties wanted additional information about how cost-effectiveness of DR programs would be represented in the forthcoming integrated resource plan. It was also noted that cost-effectiveness is determined differently depending on the regulatory process being used to seek program approval – another piece of information that stakeholders desired and is described further below.

Regulatory Process

Some stakeholders wanted more information about which regulatory process(es) would be used to seek approval for each DR program. Accordingly, parties were interested in cost-effectiveness tests (as notes above) depending on the regulatory vehicle being used as well as how measurement, verification, and reporting protocols would be executed.

Advanced Metering Infrastructure (AMI)

Stakeholders had several questions about advanced metering infrastructure in relation to new demand response offerings, including how AMI deployment would impact the timing and pricing of each offering and whether these offerings would be used to justify investment in AMI.

Alignment with Filing Objectives and Design Principles

Some stakeholders wanted more information about whether and how each program aligned with the group's Filing Objectives and Design Principles. In particular, some participants at Meeting 6 were concerned that the programs seemed fragmented, potentially limiting customer choice and compensation for flexibility. There was also a question raised about which programs are dispatchable (i.e., in the utility's control) versus those that affect load shape but cannot be actively controlled by the utility, such as time-varying rates.

Opportunities for Aggregators

Some parties wanted to know more about the role of aggregators in the various programs that were presented, including whether and how aggregators could participate.

Consolidating Offerings

Some participants recommended combining several of the different C&I demand response offerings into a single program to encourage broad participation and avoid competition between similar offerings.

REQUEST FOR A DETAILED TABLE OF OFFERINGS

At the conclusion of Meeting 6, there seemed to be general agreement among the group that a more detailed presentation of Xcel Energy's new DR programs under development would be helpful to aid with understanding and evaluating the offerings, both individually and as a total package. Several stakeholders suggested that Xcel Energy come back to the group with a table listing the various offerings, their alignment with the Filing Objectives and Design Principles, and responses to the pieces of information requested above.

In response, Xcel Energy staff offered to develop the table and provide as much information as they could, based on availability of that information and timing constraints. Xcel Energy staff presented the table for review at the seventh and final meeting in January 2019. Below, we have listed the specific items that stakeholders asked Xcel Energy to provide and a summary of

the information that was available in response. We have also included a summarized version of the table itself.¹⁶ Since these items were of interest to stakeholders during these meetings, it's likely that they'll be of interest as program move through the regulatory approval process.

1. Provide a name and short description of the offering

The table listed 20 individual demand response offerings under development, each with a short description.

2. Provide a narrative explaining how it complies with the group's Filing Objectives and Design Principles.

The table included columns that respond to many of the Design Principles and Filing Objectives, though some of the information was not yet available.

3. What is its contribution to meet the commission's requirement?

The table listed estimated DR capability values in megawatts for each program area based on the Brattle Group's potential study, adding up to a total of 271 MW. The values were representative of the incremental load available when DR programs are offered simultaneously as part of an overall portfolio, and therefore were provided by program type rather than for each specific program. Xcel Energy noted that these were initial placeholders and would fluctuate as programs are further developed.

4. Is it expected to be cost effective?

There are two cost-effectiveness columns – one based on whether the program was deemed cost effective based on avoided capacity costs; the other is based on an additional a cost-benefit analysis that was not yet available.

5. Is it dispatchable or non-dispatchable?

This was included for each offering.

6. Does it utilize AMI (to help justify the cost of investing in AMI)?

This information was not yet available.

7. Does it have energy efficiency benefits?

This was included for each offering.

8. What evidence is there of customer interest in the program?

This information was not yet available.

9. What regulatory process(es) will be used to seek approval, and are there specific conflicts or risks anticipated?

This information was available for some of the programs and unavailable for others.

10. What role, if any, is there for demand response aggregators?

¹⁶ The full table is available online in both PDF and Microsoft Excel formats at <https://trello.com/c/qvtlayfB/23-meeting-7-wrap-up-1-22-2019>

In the table presented, one of the programs—interruptible offerings for medium and small C&I customers—was targeted for third-party aggregators.

Feedback in response to the table at Meeting 7 was limited and will need to be refined as individual offerings move through the regulatory process. Overall, stakeholders said that they thought Xcel Energy was taking a thoughtful approach to a variety of achievable programs, and that the portfolio seemed forward-thinking from the perspective of supporting resource integration in the future. Some participants inquired whether the programs could be combined into more streamlined customer offerings. Xcel Energy staff responded that streamlining would take place once the company's full demand response roadmap was complete.

Participants also had the following questions in response to the table. While these were not resolved in the meeting, they may be worth pursuing in the formal regulatory process for considering Xcel Energy's DR offerings:

- Would it make a difference to consider incremental demand response from *existing* participants, since The Brattle Group's report looked only at potential for new participants?
- What will the carbon reduction impacts be from these programs?
- How might activity at MISO affect these programs?

Table 1. Summarized Version of Xcel Energy's Demand Response Offerings in Development as of January 22, 2019

| Program Type | Est. Potential (MW) | Segment | Product | Description | Est. Potential Achievement Date |
|---|---------------------|------------------------|---|---|---------------------------------|
| Behavioral DR | - | Residential | "Hands-off" DR | Use messaging without technology to encourage DR event participation | 2023 |
| Commercial Building Controls | 10 | C&I, Medium | Commercial Building | Leverage EMS software to provide DR capacity & overall demand mgmt | 2021 |
| Critical Peak Pricing | 41 | C&I, Medium | Critical Peak Pricing (Opt-in) | Base periods are similar to TOU structure with lower energy/demand prices, but during "critical" periods customer pays higher pricing | 2022 |
| Electric Vehicles | <1 | Residential | Electric Vehicle Smart Charging | MN residential smart charging pilot with L2 EVSE, proves out EE and peak load shifting, may include economic demand response | 2020 |
| | | | Electric Vehicles DR& Storage | Use EV's for DR and storage opportunities | 2024 |
| Interruptible Offerings | 79 | C&I, Medium, Small | Peak Partner Rewards | Customer receives incentives for nominated capacity and/or performance during DR events | 2020 |
| | | C&I, Medium, Small | Third-Party Aggregation | Allow third-party aggregator to promote, recruit and enroll customers into DR program. | 2021 |
| | | C&I, Medium | Interruptible Rates | Rate discount or credit for agreeing to reduce load during specified periods (updates to current program) | 2022 |
| Other (not included in Brattle Group potential study) | - | C&I | DERs for Ancillary Services | Use DERs to provide ancillary services | 2021 |
| | | C&I | Leverage Microgrids | Leverage existing or planned microgrids for DR capacity | 2022 |
| | | All | Geo-targeted Distribution | Identify stress points in distribution system & target affected customers with regular or enhanced DR offers | 2019 - CEE |
| | | TBD | Reverse DR Balance system | Load for excess renewable generation by incentivizing customers to use energy at these times | 2023 |
| | | Residential | BTM Batteries/Storage | Deploy battery technology behind customer meters for DR and load capacity | 2024 |
| Smart Thermostats | 112 | Residential | Expand current smart thermostat program | Expand current ST offerings into other markets, existing programs, or gas DR | 2021 |
| | | | Home Energy Management (HEM) | Provide technology to customers that helps reduce energy usage, educates, and facilitates DR | 2024 |
| | | | Smart Thermostat Optimization | Deploy software to manage & optimize smart thermostat operations to improve energy savings, demand reductions, etc. | 2020 |
| Smart Water Heating | 8 | Residential | Water Heaters for DR | Leverage water heaters for DR capacity | 2023 |
| | | | Water Heaters DR using CEA-2045 connection/technology | Via a controlled demonstration, this project will provide economic justification and a plan for a market transformation | 2023 |
| Thermal Storage | - | C&I | Thermal Storage | Leverage things like refrigeration as storage devices to shift demand | 2023 |
| Updating Saver's Switch | 21 | Residential, Small C&I | Saver's Switch (2-way communicating) | Updating our current technology and expanding the program | 2021 |

VI. Conclusion and Next Steps

In compliance with the Commission's requirement to procure an additional 400 MW of demand response, Xcel Energy is in the process of reviewing roughly 20 expanded and new DR program offerings in its NSP service territory.

Those offerings are based in part on a study that Xcel Energy hired The Brattle Group to conduct to identify the potential for cost-effective, incremental DR programs, which found that the company could meet some, but not all, of the Commission's required demand response capability cost-effectively by 2023. This finding was due to a series of factors, including low capacity prices, lack of advanced metering infrastructure to enable some programs, low development costs for new generation assets, and limited benefits from ancillary services and transmission and distribution deferral.

There are multiple next steps for Xcel Energy's demand response offerings for Minnesota. The portfolio as a whole will be considered in Xcel Energy's next Integrated Resource Plan filing, with an assumption of deploying enough DR to meet the Commission's requirement by 2023 for at least one of the plan options. The individual demand response programs that will be deployed to achieve that requirement are currently in development and will be brought forth for regulatory approval, though the exact details of regulatory consideration were not available at the time of these stakeholder meetings.

As those offerings are determined to move forward, the Design Principles and Filing Objectives that were collaboratively developed by stakeholders as part of this process offer a useful framework, both for providing ongoing guidance to the design of those offerings, and for evaluating them once they are finalized and submitted for regulatory consideration. To the extent that program offerings can be designed and filed in accordance with the stakeholder guidance captured in this report, they will have a higher likelihood of earning stakeholder support.

ATTACHMENT B

Xcel Energy Draft DR Product Matrix

This matrix addresses DR products in development in January 2019. Responses here are general parameters – exact facts may dictate different results. This matrix may be updated or corrected upon further review. This matrix is still a work in progress – please do not distribute outside of the Demand Response Workgroup.

| Program Type | Segment | Product | Description | Estimated Potential ¹ | Est. Target Potential Achievement | Potential EE Component | Regulatory Pathway | Regulatory Risk | Dispatchable | Cost-Effective (avoided cost analysis) | Cost-Effective (cost-ben model) | Carbon Reduction | Supports Reliability | Supports Flexibility | Supports Resource Integration |
|------------------------------|--------------------|---------------------------------|---|----------------------------------|-----------------------------------|------------------------|--------------------|-----------------|--------------|--|---------------------------------|------------------|----------------------|----------------------|-------------------------------|
| Behavioral | | | | - | | | | | | | | | | | |
| | Residential | Behavioral DR "Hands-off" DR | Use messaging without technology to encourage DR event participation | | 2023 | YES | CIP | TBD | NO | NO | TBD | TBD | TBD | NO | NO |
| Commercial Building Controls | | | | 10 MW | | | | | | | | | | | |
| | C&I, Medium | Commercial Building | Leverage EMS software to provide DR capacity & overall demand mgmt | | 2021 | YES | CIP | TBD | YES | YES | TBD | YES | YES | YES | YES |
| Critical Peak Pricing | | | | 41 MW | | | | | | | | | | | |
| | C&I, Medium | Critical Peak Pricing (Opt-in) | Base periods are similar to TOU structure with lower energy/demand prices, but during "critical" periods customer pays higher pricing | | 2022 | NO | TBD | YES | YES | YES | TBD | YES | YES | YES | NO |
| Electric Vehicles | | | | <1 MW | | | | | | | | | | | |
| | Residential | Electric Vehicle Smart Charging | MN residential smart charging pilot with L2 EVSE, proves out EE and peak load shifting, may include economic demand response | | 2020 | NO | CIP | TBD | NO | YES | YES | YES | YES | YES | YES |
| | Residential | Electric Vehicles DR& Storage | Use EV's for DR and storage opportunities | | 2024 | NO | TBD | TBD | NO | YES | TBD | YES | YES | YES | YES |
| Interruptible Offerings | | | | 79 MW | | | | | | | | | | | |
| | C&I, Medium, Small | Peak Partner Rewards | Customer receives incentives for nominated capacity and/or performance during DR events | | 2020 | NO | CIP/Rates | YES | YES | YES | TBD | YES | YES | YES | YES |
| | Medium, Small | Third-Party Aggregation | Allow third-party aggregator to promote, recruit and enroll customers into DR program. | | 2021 | NO | CIP/Rates | YES | YES | YES | TBD | YES | YES | YES | YES |
| | C&I, Medium | Interruptible Rates | Rate discount or credit for agreeing to reduce load during specified periods (updates to current program) | | 2022 | NO | CIP/Rates | YES | YES | YES | TBD | YES | YES | YES | YES |
| Other ⁴ | | | | - | | | | | | | | | | | |
| | C&I | DERs for Ancillary Services | Use DERs to provide ancillary services | | 2021 | TBD | TBD | TBD | YES | NA | TBD | YES | YES | YES | YES |
| | C&I | Leverage Microgrids | Leverage existing or planned microgrids for DR capacity | | 2022 | TBD | TBD | TBD | YES | NA | TBD | YES | YES | YES | YES |
| | All | Geo-targeted Distribution | Identify stress points in distribution system & target affected customers with regular or enhanced DR offers | | 2019 - CEE | TBD | TBD | TBD | YES | NA | TBD | YES | YES | YES | YES |
| | TBD | Reverse DR Balance system | Load for excess renewable generation by incentivizing customers to use energy at these times | | 2023 | TBD | TBD | TBD | NO | NA | TBD | YES | NO | NO | YES |

| Program Type | Segment | Product | Description | Estimated Potential ¹ | Est. Target Potential Achievement | Potential EE Component | Regulatory Pathway | Regulatory Risk | Dispatchable | Cost-Effective (avoided cost analysis) | Cost-Effective (cost-ben model) | Carbon Reduction | Supports Reliability | Supports Flexibility | Supports Resource Integration |
|-------------------------|------------------------|---|---|----------------------------------|-----------------------------------|------------------------|--------------------|-----------------|--------------|--|---------------------------------|------------------|----------------------|----------------------|-------------------------------|
| | Residential | BTM Batteries/Storage | Deploy battery technology behind customer meters for DR and load capacity | | 2024 | TBD | TBD | TBD | TBD | NA | TBD | YES | YES | YES | YES |
| Smart Thermostats | | | | 112 MW | | | | | | | | | | | |
| | Residential | Expand current smart thermostat program | Expand current ST offerings into other markets, existing programs, or gas DR | | 2021 | YES | CIP | TBD | YES | YES | YES | YES | YES | NO | NO |
| | Residential | Home Energy Management (HEM) | Provide technology to customers that helps reduce energy usage, educates, and facilitates DR | | 2024 | YES | TBD | TBD | YES | NA | TBD | YES | YES | YES | YES |
| | Residential | Smart Thermostat Optimization | Deploy software to manage & optimize smart thermostat operations to improve energy savings, demand reductions, etc. | | 2020 | YES | CIP | TBD | YES | YES | YES | YES | YES | YES | YES |
| Smart Water Heating | | | | 8 MW | | | | | | | | | | | |
| | Residential | Water Heaters for DR | Leverage water heaters for DR capacity | | 2023 | YES | TBD | YES | YES | YES | TBD | YES | YES | YES | YES |
| | Residential | Water Heaters DR using CEA-2045 connection/technology | Via a controlled demonstration, this project will provide economic justification and a plan for a market transformation | | 2023 | YES | TBD | YES | YES | YES | TBD | YES | YES | YES | YES |
| Time of Use | | | | - | | | | | | | | | | | |
| Thermal Storage | | | | - | | | | | | | | | | | |
| | C&I | Thermal Storage | Leverage things like refrigeration as storage devices to shift demand | | 2023 | YES | TBD | TBD | TBD | NO | TBD | YES | YES | YES | YES |
| Updating Saver's Switch | | | | 21 MW ³ | | | | | | | | | | | |
| | Residential, Small C&I | Saver's Switch (2-way communicating) | Updating our current technology and expanding the program | | 2021 | NO | CIP/Rates | YES | YES | YES | TBD | YES | YES | NO | NO |

Notes:

1. Estimated Potential is based on the January 2019 Brattle Group Analysis conducted on behalf of Xcel Energy. This potential is incremental load available when DR programs are offered simultaneously as part of an overall portfolio which is why it is conducted at a program type level. These are placeholders as programs are developed.

2. Customer Participation is TBD at this time as programs are finalized and developed. These details will be available upon filing.

3. Potential for SS was based on current program and not a remodeled program as in our product roadmap.

4. The "other" category was not reviewed by January 2019 Analysis.

CERTIFICATE OF SERVICE

I, Ingrid E. Bjorklund, hereby certify that I have this day served a true and correct copy of the following document via electronic filing to all persons indicated on the attached service list:

The Advanced Energy Management Alliance's Petition Requesting a
Miscellaneous Docket to Address Demand Response Ordered in Docket No. E-
002/RP-15-21 with Attachments A and B

Dated this 14th day of April, 2020.

/s/ Ingrid Bjorklund
Ingrid E. Bjorklund

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| First Name | Last Name | Email | Company Name | Address | Delivery Method | View Trade Secret | Service List Name |
|------------|-----------|---------------------------|--|--|--------------------|-------------------|------------------------------|
| Joseph | Windler | jwindler@winthrop.com | Winthrop & Weinstine | 225 South Sixth Street, Suite 3500 Minneapolis, MN 55402 | Electronic Service | No | GEN_SL_AEMA_AEMA Petition |
| Patrick | Zomer | Patrick.Zomer@lawmoss.com | Moss & Barnett a Professional Association | 150 S. 5th Street, #1200 Minneapolis, MN 55402 | Electronic Service | No | GEN_SL_AEMA_AEMA Petition |