

December 1, 2020

Will Seuffert
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
Saint Paul, Minnesota 55101-2147

RE: Report of the Minnesota Commerce Department, Division of Energy Resources
Docket No. E002/M-19-666 and E999/DI-20-627

Dear Mr. Seuffert:

Attached is a Report from the Minnesota Commerce Department, Division of Energy Resources (Department) on Methods for AMI and FAN Performance Evaluations, Metrics, and Customer Protections. The Report is in response to the July 23, 2020 Minnesota Public Utilities Commission's (Commission) Order Point 9 in the following matter:

Northern States Power Company d/b/a Xcel Energy's Integrated Distribution Plan and Advanced Grid Intelligence and Security Certification Request

The Department is available to answer any questions that the Commission may have in this matter.

Sincerely,

/s/ TRICIA DEBLEECKERE
PLANNING DIRECTOR

TD/ja
Attachment



Methods for Performance Evaluations, Metrics, and Consumer Protections for AMI and FAN

Department of Commerce Report to the Public Utilities Commission
December 1, 2020

Report

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E002/M-19-666 and E999/DI-20-627

REPORT ON METHODS FOR AMI AND FAN PERFORMANCE EVALUATIONS, METRICS, AND CUSTOMER PROTECTIONS

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I. Introduction

On July 23, 2020, the Minnesota Public Utilities Commission (Commission) issued its *Order Accepting Integrated Distribution Plan, Modifying Reporting Requirements, and Certifying Certain Grid Modernization Projects*. As part of the ordering requirements, the Commission requested the Minnesota Department of Commerce, Division of Energy Resources (Department) to provide a report on recommendations on metrics, methods for evaluating performance, and consumer protections or other conditions, including cost caps, that should be applied to Northern States Power Company, doing business as Xcel Energy's (Xcel or the Company) Commission-certified investments in Advanced Metering Infrastructure (AMI) and a Field Area Network (FAN).

The Commission requested that the report and recommendation be informed by a stakeholder process that is open to all interested parties, and that the report be made part of the record for future cost recovery proceedings. Xcel was directed to participate in the stakeholder process, and to fully cooperate with the Department.¹

The Department of Commerce appreciates the opportunity to provide this report and recommendations to the Commission. The decisions and frameworks made relating to AMI and FAN are foundational decisions, and as explained by Xcel, the technologies will enable a transformation of the distribution grid and have the potential to redefine the customer experience.²

It is important to highlight that many of the consumer protections, metrics and methods to evaluate performance will need to either be refined, modified, or created upon review of Xcel's Initial AMI/FAN Cost Recovery Petition or Proceeding. Without further information on Xcel's final scope and framework, it is not possible to establish or create finalized requirements or metrics. It is expected that this work will continue through the Initial AMI/FAN Cost Recovery Proceeding and the Department looks forward to this effort.

II. Report Background

As articulated by stakeholders, a modernized distribution grid is necessary to advance Minnesota's energy goals, can support integration of additional levels of renewables, has the potential to empower consumers to make their own choices about the level and type of electric service they desire, and can leverage customer-sited resources to assist in grid operation. Likewise, implementation of a distribution system grid modernization program should assist in both improving system reliability and flexibility. AMI, and the interrelated FAN, can lay an important foundation for a dynamic, customer-centric utility approach in the future.

¹ See Commission's Order Accepting Integrated Distribution Plan, Modifying Reporting Requirements, and Certifying Certain Grid Modernization Projects, Docket E002/M-19-666. (AMI/FAN Certification Order). Doc. ID: [20207-165209-01](#)

² See Xcel Energy's 2019 Integrated Distribution Plan (2019 IDP), Docket E002/M-19-666. Doc. ID: [201911-157133-01](#)



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Seeking reasonable methods for evaluating performance, establishing metrics to be used in cost recovery assessments, as well as establishing consumer protection at the outset is crucial to ensuring that the full benefits and potential of AMI are evaluated and, to the extent the Commission deems reasonable, are fully realized by Xcel and its customers. AMI has historically been an asset that utilities have difficulty fully utilizing, as explained by the Citizens' Utility Board of Minnesota (CUB):⁴

In addition, the customer-facing value proposition identified at the outset of a project is not often realized upon implementation. To illustrate this point, a recent report by the American Council for an Energy-Efficient Economy (ACEEE) has demonstrated that few U.S. utilities have truly captured the full range of AMI capabilities and customer-facing benefits. Of the 26 utilities with AMI in place, only one – Portland General Electric in Oregon – was engaging in all of the AMI business cases identified by ACEEE as of late 2018.⁴ These elements are further underscored by the Company's own determination that quantifiable benefits do not exceed quantifiable costs. Accordingly, the realization of qualitative, customer-facing benefits is critical to justifying an investment of this magnitude and to protecting consumers.

⁴See Rachel Gold, Corri Waters, and Dan York, Leveraging Advanced Metering Infrastructure to Save Energy, American Council for an Energy Efficient Economy, January 3, 2020.

Additionally, Xcel is in the unique position of 1) being one of the first utilities in the nation to utilize a newer AMI feature, AMI with Distributed Intelligence (AMI-DI) and 2) being one of the first handful of utilities to use the Itron Riva Gen 4.2 AMI-DI meter. Due to the recent release of the Riva Gen 4.2 AMI-DI meter, no utility has yet used these meters in a full-scale roll out and in utility operations.⁵

³ Xcel 2019 IDP, pg. 8

⁴ See CUB Comments, Docket E999/DI-20-627, page 2. Doc. ID: [202010-167403-01](#)

⁵ See Xcel's response to Department IR 37 (Appendix D).

Xcel's new meters will be referred to AMI-DI throughout this report to ensure that readers differentiate Xcel's meters, with the DI-attributes and associated capabilities, from that of "traditional" AMI. The differences are meaningful. As noted above, while most utilities across the nation have struggled to optimize the full value of AMI, layering on the DI-attributes and capabilities brings a new level of required oversight, accountability, and understanding to this smart meter proposal. An explanation of the AMI versus AMI-DI is provided in Section III.

Stakeholder input provided during this process indicated there was still considerable concern regarding whether these investments are suitable for rider inclusion. The Department continues to share in this concern and in light of it, has attempted to develop methods to evaluate performance, metrics, and customer protections, outlined below, that will have the added functionality of assisting the Commission, Xcel, and other stakeholders in determining whether these investments are suited to be included in Xcel's Transmission Cost Recovery (TCR) Rider.⁶ Ultimately, the appropriate venue chosen for cost recovery should be driven by the ability of Xcel to articulate and clearly provide a scope of its plans, goals, timelines, and outcomes for its investments and provide clear tracking mechanisms and transparency of its project implementation through its filings.

Analysis and record development created during the inaugural AMI and FAN TCR Rider petition, (referred to in this report as the Initial AMI/FAN Cost Recovery Petition or Proceeding) will be illustrative and informative for the Commission and stakeholders on whether use of a rider for cost recovery is sufficiently protective of consumers (versus traditional methods of cost recovery).⁷ On-going assessment and review of future TCR petitions, if used as the vehicle for cost recovery, will involve continued evaluation of AMI and FAN investments for their prudence and continued reasonableness of recovery through the rider. The Department has attempted, as part of the Methods to Evaluate Performance and Customer Protections sections of this report, to create a framework for this continued assessment.

To execute this stakeholder process and compile this report, the Department took several actions: it solicited stakeholder feedback (included as Appendix A and B to this report), held a workshop to answer fundamental questions on some of Xcel's proposed technologies and plans and to allow stakeholders to ask real-time questions of Xcel (Appendix C), allowed stakeholder the opportunity to present information in the stakeholder forum, conducted informal discussions and interviews with subject matter experts, and issued and received thousands of pages of information requests (IRs) and responses. Notable information request responses are cited throughout this report and are attached as Appendix D to this report.

⁶ MN Stat. § 216B.16, subd. 7b (1) allows the Commission to approve rider recovery for distribution facilities that are certified as a priority project.

⁷ 2019 AMI/FAN Certification Order, Order Point 11.

III. Xcel’s Advanced Grid Investment Background

As part of its overall implementation process to modernize the distribution system, Xcel has established its Advanced Grid Intelligence and Security (AGIS) initiative.⁸ Xcel noted that its AGIS Initiative is intended to provide a better customer experience, giving customers more information and control over their energy usage; implementation of AGIS Initiative would enable advanced rate design, as well as other future programs and services. The AGIS Initiative includes several advanced technologies, one of which is of issue here, meter replacement and AMI.

The Commission certified a portion of the AGIS initiative - Xcel’s AMI and FAN technologies - under Minnesota Statute § 216B.2425 (July 23 Order).⁹ This statute allows projects that the utility deems necessary for grid modernization, once certified by the Commission, to be included in petitions for cost recovery under the Transmission Cost Recovery (TCR) rider.¹⁰ At the time of these comments, no costs have been sought for recovery for the AMI or FAN projects through the TCR.

Xcel’s existing meters, and its current meter reading technology - Automated Meter Reading (AMR) service – are nearing end of life; the vendor will no longer manufacture replacement parts for the system after 2022.¹¹ As discussed in Xcel’s reply comments in Docket No. E002/M-20-680, the certified communication framework (WiMAX/WiSUN) has been modified due to a recent Federal Communications Commission decision. Additional detail and an update are expected at the time Xcel requests cost recovery.¹² Below is a diagram showing the previously proposed WiMAX Network and the new “Currently Deployed Cellular” framework.¹³

⁸ Generally, Docket Nos. E999/CI-15-556, E002/M-17-776, E002/CI-18-251, and E002/M-19-666.

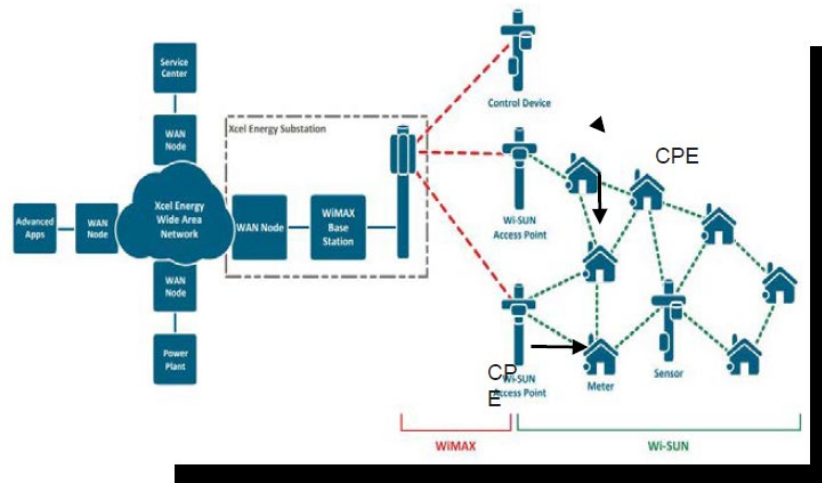
⁹ See 2019 Certification Order.

¹⁰ See Minn. Stat. 216B.2425.

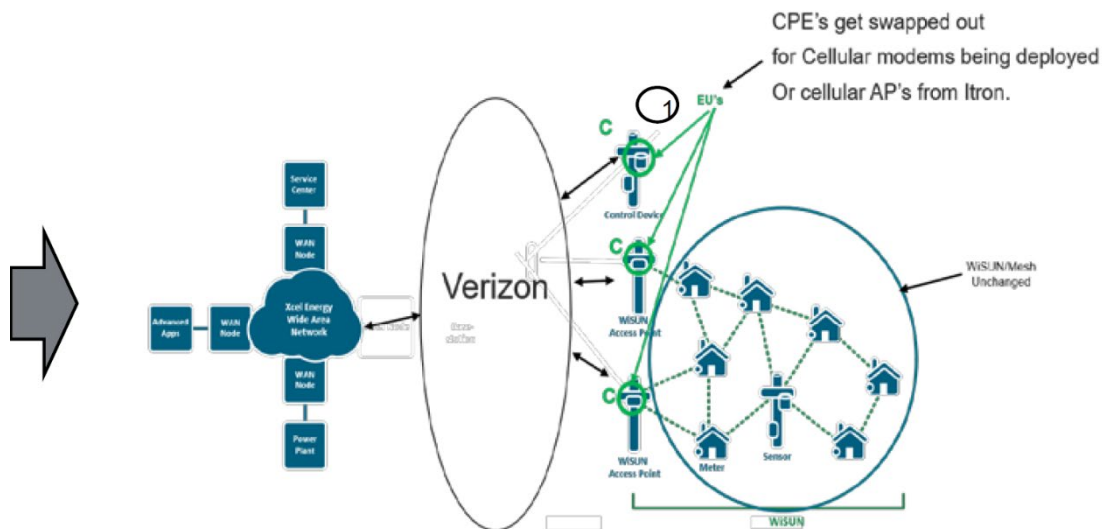
¹¹ Xcel’s 2019 IDP, page 150.

¹² See Commission Docket E002/M-20-680, Xcel Reply, October 30, 2020. Pg. 3 (20-680 Xcel Reply Comments) and Xcel’s response to Department IR 39-41.

¹³ See Xcel’s October 23 Stakeholder Presentation (Appendix C)



Previous WiMAX Network



Substation is bypassed and not used in this solution

Currently deployed Cellular

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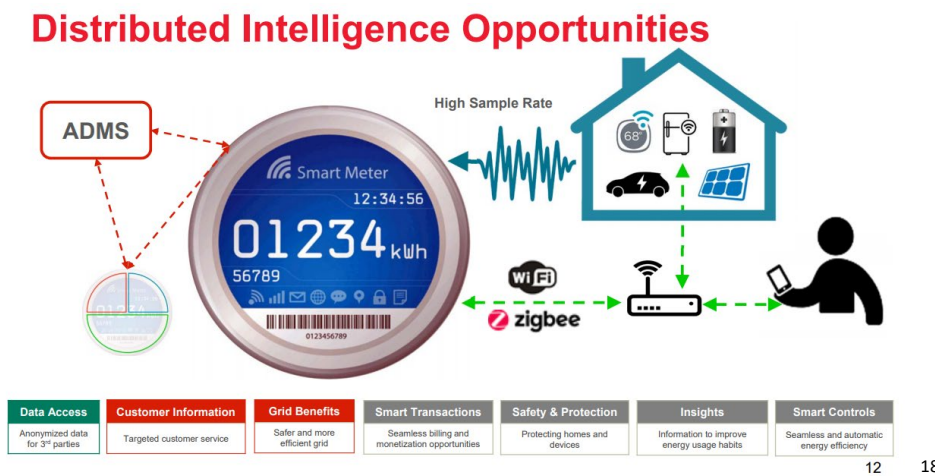
Xcel originally anticipated beginning installation of the AMI meters as soon as 2021 (earlier for persons enrolled in the Time-of-Use (TOU) Pilot) and with installation continuing through 2024.¹⁴ However, the TOU Pilot has been delayed due to the COVID-19 pandemic¹⁵ and the scheduled

¹⁴ 2019 IDP, Attachment M1 Gersack Direct, Schedule 3, pg. 26.

¹⁵ Currently, the TOU Pilot that was scheduled to start on April 1, 2020—and was expected to inform development of additional advanced rate designs—has been delayed due to the COVID-19 pandemic. Therefore, questions exist regarding the current bill impacts for all customer classes, and the future customer benefits of advanced rate design. See Department Attachment 2, Xcel Letter [Pilot Postponement](#) filed in Docket No. E002/M-17-775, dated March 18, 2020.

installation of the meters has shifted from the original schedule proposed in the 2019 Integrated Distribution Plan (IDP).¹⁶ Xcel noted in response to the Department’s Information Request No. 2 in Docket E002/M-20-592, that meter installation has been delayed from 2021 to 2022.¹⁷

Xcel has selected Itron’s Riva Generation 4.2 AMI-DI meters; these meters have Distributed Intelligence (DI) capabilities. Distributed Intelligence is technology that enables computational processing at a distributed location, *i.e.* at the customer meter. The AMI-DI meters selected by Xcel have several notable advanced technologies: the DI components allow Xcel to utilize selected applications on the meters themselves, the meters can run as a processor, again, at the meter, and the meters have an embedded Network Interface Card (NIC) components enabling a meter-provided utility services Wi-Fi connection to enabled home devices.



As noted in the Department’s comments in the E002/M-19-666 proceeding, Xcel has entered into contracts with Itron for AMI-DI meters, as well as meter/DI-application development.¹⁹

“This collaboration is exciting because we’re not just developing the next generation of smart meters,” said Brett Carter, Xcel Energy’s chief customer and innovation officer, and executive vice president. “Combining forces with Itron allows us to work together on new applications to benefit our customers and build the electrical grid of the future.”

The distributed computing and application capabilities are unlike any AMI proposal put forth in Minnesota and is industry-leading.²⁰ As noted by Xcel, these meters are like “putting an iPhone on

¹⁶ Table 56 in Xcel Energy’s 2019 IDP, pg. 248.

¹⁷ See Department Comments in E002/M-20-592, Dated September 9, 2020. Doc ID: [20209-166485-01](#)

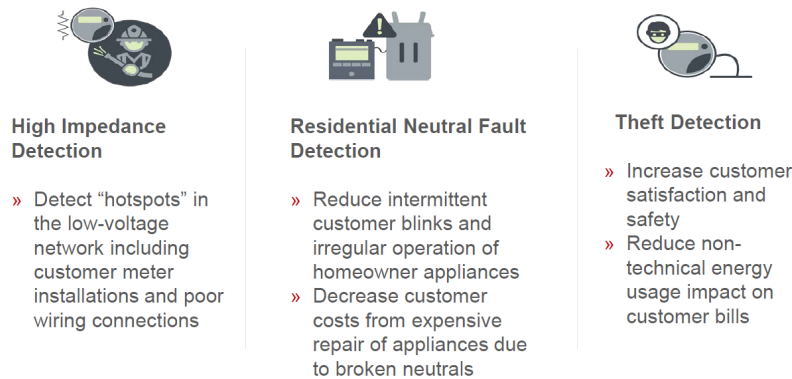
¹⁸ See Xcel’s October 23, 2020 Presentation, Appendix C.

¹⁹ See: <https://www.smart-energy.com/industry-sectors/smart-meters/itron-and-xcel-to-build-an-advanced-electrical-grid-of-the-future/>, accessed February 29, 2020 and Department Initial Comments, filed March 17, 2020, in E002/M-19-666, Page 24.

²⁰ See Xcel response to Department IR 37 (Appendix D)

the side of the meter,” are “no different than an iPhone” and are “bleeding edge” in terms of what “any utility is trying to deploy out in the field.”²¹ The Riva AMI-DI meters have applications available today in three categories through the Itron application store: 1) High Impedance Protection, 2) Residential Neutral Fault Detection, and 3) Theft Detection, and as noted by the Department in the E002/M-19-666 docket, and noted above, Xcel contracted with Itron to collaborate on additional applications.²²

Existing Distributed Intelligence Applications



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Additionally, Itron has developed an application development platform (software development kits) in which third parties (ultimately approved by Itron) can submit proposed applications to Itron for utilization in their AMI-DI app-store.²⁴ It has not been conclusively disclosed in a Commission docket which applications are expected be used on the Xcel AMI-DI meters, who will select the application(s), what level of control customers will have over which applications are installed on their meters, or what rights exist to customer data through the Home Area Network (HAN).

²¹ Roopesh Aggarwal: Senior Director, Business Innovation - Xcel Energy, 2019 <https://www.youtube.com/watch?v=ASv4w0lwotA>

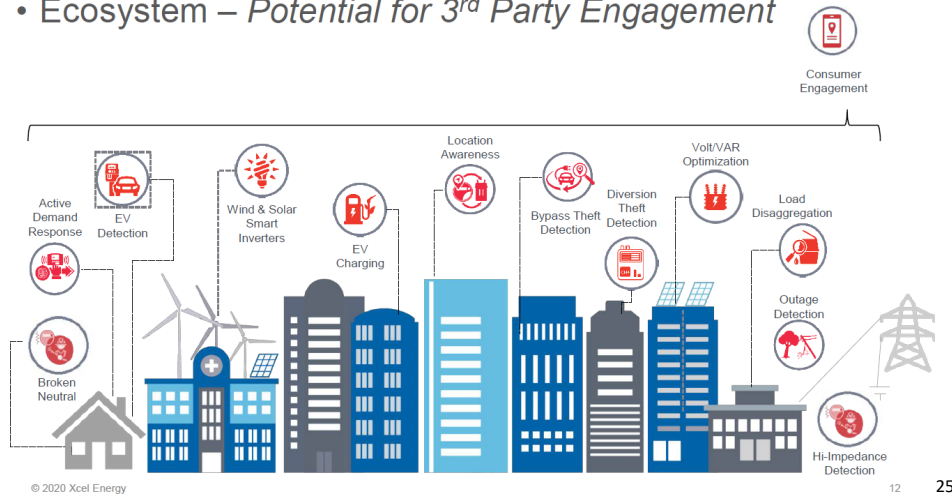
²² www.itron.com/-/media/feature/products/documents/brochure/distributed-intelligence-applications.pdf; Id. 10

²³ See Xcel’s October 23, 2020 Presentation, Appendix C.

²⁴ <https://developer.itron.com/content/distributed-intelligence-introduction>

Distributed Intelligence Potential

- Intelligence that empowers
- Ecosystem – *Potential for 3rd Party Engagement*



IV. Methods to Evaluate Performance, Metrics, and Consumer Protections

Metrics, methods to evaluate performance, and customer protections will evolve as Xcel moves through stages of AMI and FAN implementation: 1) *Planning*, 2) *Installation*, 3) *Early Operations*, 4) *Long-Term Operations*. As Xcel has noted, “Given that we essentially will be deploying computers with each of our meters, knowing the full extent of their capabilities at the outset is impossible.”²⁵ The Department agrees, to a point, that technological or policy changes may occur rapidly over the next decade, and to know the full potential or capability of AMI-DI now, is infeasible, however, several considerations are necessary: 1) an initial, baseline establishment of scope, functionality, expected performance, timing, and cost, 2) an evaluation framework to provide structure and articulate how changes or new developments will be factored into the review process and Xcel’s plans, and 3) some level of Commission input at various steps throughout implementation.

The Department provides a framework below, that can be adapted and modified as technological and policy changes occur and as the projects progress. As the Commission and stakeholders move through project implementation stages, the methods and metrics used to evaluate projects will also evolve (e.g. deployment metrics versus system operational metrics).

²⁵ See Xcel’s October 23, 2020 Presentation, Appendix C.

²⁶ 20-680 Xcel Reply, pg. 3.

Consideration of and recommendations for metrics, performance evaluation methods, and customer benefits are discussed in this report under the categories listed below:

1. Commission Input
2. Investment Scope
3. Foundational Protections
4. Additional Plans or Filings
5. Metrics
6. On-Going Reporting Requirements

Any Department-proposed metrics, customer protections and performance evaluation methods that are approved by the Commission will affect the information Xcel provides in its cost recovery request and provide a structure for stakeholder analysis in the Initial AMI/FAN Cost Recovery Proceeding. Longer-term, the Commission's decisions on the Department's recommendations will serve as a living document that will provide guidance to cost recovery over the next 10+ years of recovery for the AMI and FAN.

A. Commission Consideration of Report

In the near-term, some of Xcel's expected filing content (inputs to the Initial AMI/FAN Cost Recovery Petition) may need to be adapted to, conform to, or respond to the Commission's decisions after considering the Department's report. Therefore, Commission consideration (including further stakeholder input) of the Department's recommendations prior to initiation of the cost recovery review would likely be beneficial.²⁷ This could occur prior to an Initial AMI/FAN Cost Recovery Petition, or at a completeness review/scoping stage of any cost recovery proceeding (if that step is authorized). Additionally, consideration of the metrics that will be proposed by Xcel in its cost recovery Initial AMI/FAN Cost Recovery Petition (as required by the Commission) may need Commission input on how they are to align, or not, to the Department's proposal and how they are to be used in year 1 of the cost recovery review.²⁸

The recommendations made in this report may require modification based on information filed by Xcel in its Initial AMI/FAN Cost Recovery Petition and likely, iteratively as out-year AMI and FAN plans are defined and submitted for cost recovery.²⁹ Last, a check-point prior to initiation of a cost recovery proceeding (or in conjunction with a review of completeness) would allow for Commission input on other topics, discussed below, and provide a forum for the Commission to provide input or feedback on areas that need further development.

²⁷ 2019 AMI/FAN Certification Order, Order Point 9.

²⁸ 2019 AMI/FAN Certification Order, Order Point 8.

²⁹ 20-627 Xcel Comments, pg. 3

(Recommendation – General Recommendation 1) Prior to initiation of a cost recovery proceeding (or at a completeness review of the a cost recovery filing)³⁰ the Commission should approve, reject, or modify the Department’s recommendations for methods to evaluate performance, and establish metrics and customer protections or, at a minimum, establish baseline considerations to be evaluated in the cost recovery petition.

B. Consumer Protection - Investment Scope

As the Department has noted in previous comments, a foundational requirement when establishing consumer protections and performance metrics, is to clearly identify the investment scope. Xcel must articulate its final project scope for the AMI and FAN projects, including its final cost-benefit analysis of the investments, as soon as possible, but in no circumstance, later than its Initial AMI/FAN Cost Recovery Petition.

Xcel has provided considerable detail in previous filings, but has cautioned that the information is preliminary and is subject to change. The Department’s comments in Docket No. E002/M-20-680 outline that since certification, several components of the project scope have changed, including the meter deployment timeline and a change in the FAN project from the use of WiMAX to some other to-be-determined solution (using Verizon cellular service as an interim solution).^{31,32}

The project scope of the AMI and FAN investments should be clear, concise, and accountable to the benefits claimed in the certification request, the benefits assumed in Xcel’s cost-benefit ratio, and the benefits Xcel will use to substantiate prudence of its investments. In arguments supporting use of traditional cost recovery methods, CUB provided input on why establishment of costs and their cost categories is imperative for assessment of cost recovery, particularly over multiple years. The Department and other stakeholders have all relayed similar concerns to those of CUB:³³

Another important issue raised by the use of TCR rider recovery for AGIS Initiative investments is one of clear accountability for tracking the costs and benefits associated with the AGIS Initiative. An approach that handles cost recovery through the TCR rider and outside of base rates enhances the risk that certain costs associated with the AGIS Initiative will be double recovered - once through the TCR rider and again through base

³⁰ See Department Comments, Docket E002/M-20-680. Dated October 16, 2020. Doc ID: [202010-167412-01](#)

³¹ See 20-680 Xcel Comments, pg. 1

³² This change is a useful example of why a scope should be approved by the Commission; there is currently insufficient detail in the existing records to track and determine what changes the FAN to LTE/Verizon will cause, what the costs of the interim solution are in relation to the previous FAN plans, nor the costs incurred from the already installed FAN equipment. Additionally, Xcel’s response to Department IR No.6, pg. 2, IR 7, and IR 13 (see Appendix D), outlines additional analysis that would need to be conducted on Xcel’s future communication capabilities if it was to be used for DER connected on Xcel’s system (versus the requirements for the DER to utilize a third party communication pathway) or for Xcel gas meters. See Xcel’s response to Department IR 31 – 33 regarding a discussion about enterprise-wide plans, and considerations or requirements in Minnesota that may raise costs from a to-be-determined baseline.

³³ CUB Comments, pg. 2-3

rates. Due to the separate venues for cost recovery, there are likely to be overlapping or difficult-to-distinguish costs related to distribution investments. It will not always be clear which costs should be attributed to AGIS investments, recovered through a rider, and which costs should be classified as other distribution investments, recovered through a general rate case. Given this opportunity for confusion, there is a risk that certain costs will be double counted. By having to review distribution system investments across multiple filings, it makes it far more challenging to ensure accountability and avoid this potential double recovery issue.

CUB also recommended that Xcel be held to the benefits claimed in the certification request. The Department discusses methods to achieve that result, below, in the section, Performance Evaluations. Last, the baseline assessment of investment scope, functionality, and intended use is foundational to setting performance evaluations and metrics. As noted by Xcel (post-certification of AMI and FAN):

Metrics that are designed to track the progress of the project implementation should be established in conjunction with the cost recovery request where those plans are detailed and [al]so where the Company would define the technology, scope, and timing – all of which are essential to assessment of progress.

As we have responded throughout, it is necessary to evaluate the performance of AMI and FAN relevant to the specific technology, scope, and timeline approved by the Commission.^[34]

The Commission could review the investment scope as part of the Initial AMI/FAN Cost Recovery Petition for cost recovery, however, Xcel noted that it will not file the TCR Rider Petition as planned on November 6, 2020, citing concern over to stakeholder workload.³⁵ It is unknown at the time of the finalization of this report when Xcel will file its next TCR Petition. Additionally, it is expected that some level of stakeholder outreach and involvement will be required to finalize the scope of the AMI and FAN and to reach a sufficient level of detail to support a request for cost recovery. The Department recommends that Xcel work with stakeholders and Commission staff to ensure the level of clarity and detail in their AMI and FAN scope is sufficient for stakeholders to evaluate any future cost recovery request.

The Department recommends that the Commission make this requirement explicit. In response to a Department IR, Xcel explained that they intended to file:³⁶

³⁴ See Commission Docket E999/DI-20-627, Xcel Comment, September 25, 2020, pg. 2. Doc. ID: [20209-166859-02](#) (20-627 Xcel Comments)

³⁵ See Commission Docket E002/M-20-680, Xcel Reply, October 30, 2020. Pg. 3 Doc. ID: [202010-167866-03](#) (20-680 Xcel Reply Comments)

³⁶ See Xcel response to Department IR 43 (Appendix D)

similar information with our cost recovery request compared to what we submitted with our request for certification. Specifically, with respect to the technical capabilities, we intend to submit the same level of information, which is the best information we have at this time.

Additional detail is warranted; at recent stakeholder meetings on Xcel's demand response proposal, it was noted by Xcel staff that there were functionalities of the AMI-DI meters and communication network that would be used as part of some of the demand response product offerings (functionalities that are listed as potential or unknown in AMI-DI filings). It appears that Xcel is moving forward with plans to use certain aspects of AMI-DI and associated infrastructure (and potentially, applications) that it has not yet articulated in its AMI-DI filings.

(Recommendation – Consumer Protection 1) Require Xcel file as part of its Initial AMI and FAN Cost Recovery Petition its project scope of the AMI and FAN projects, including a complete, clear and concise description of the equipment, functionalities, capabilities, goals, timelines, and costs. The project and cost recovery proceeding scope should be defined by the Commission prior to or during a completeness review of the initial cost recovery proceeding.

C. Consumer Protection - Foundational Protections and Considerations

The Department believes there are several foundational consumer protections that should be established at the outset for the FAN and AMI investments regarding pass-through of related revenues and cost caps.

1. AMI- and FAN-Related Revenues and Savings

The investments and technologies that Xcel is deploying are novel (AMI-DI) and the specific technologies and capabilities of the meters and applications selected by Xcel (Itron Riva Gen 4.2) have not been deployed on an operation scale by Xcel or any other utility. As noted above, the full breadth of applications and functions that may be possible are not yet known. As noted by Xcel:³⁷

Some parties also indicated the desire for us to articulate all possible capabilities of the advanced meters at the outset, or all possible ways the advanced meters might be leveraged to create customer value in order to assess prudence. And similarly, that we should provide a definitive timeline for all possible customer programs, services, or achievement of all Company operational efficiencies. Given that we essentially will be deploying computers with each of our meters, knowing the full extent of their capabilities at the outset is impossible.

³⁷ 20-680 Xcel Reply Comments, pg. 3.

The Department agrees with Xcel's assessment above, that knowing the future is impossible – however, articulating and committing to known plans and explaining and targeting future goals, is not.

Additionally, in light of these technological investments, and their function as a platform, these investments have the ability to not only provide future unknown *capabilities*, but also, the potential to produce future revenue. The revenue streams created in the near term, or the ones created by the investment in the platform, will be made possible by investments paid for by Xcel's customers. Further, the investment risks inherent in these cutting-edge investments (notably illustrated by a cost benefit ratio less than one) are real, and should not be minimized given the likelihood that the costs will be recovered through a rate rider.

At this time, the customer should not bear all the risk of the cost of the asset (costs of an unknown amount at this time) and the risk of performance (that is entirely in the control of Xcel), particularly given that any future revenue stream, or share of the revenue, is unknown. Further, not requiring that all revenues from the AMI and FAN default to the ratepayer creates no incentives for Xcel to revenue share, pass-back savings, nor disclose new revenue streams. Customer risks, compounded with the fact that these investments are being considered for rider inclusion, make tracking costs and revenues even more important, and also more difficult.³⁸ In terms of customer protection the Department is guided by Minn. Stat. § 216B.03, which requires that, "Any doubt as to reasonableness should be resolved in favor of the consumer."

In order to ensure that customers get a benefit from these investments, it is imperative that we assume all associated revenues or savings will be passed through to the ratepayer *until otherwise determined by the Commission*. It is important to stress that revenue sharing is expected and that there will be a future revenue sharing framework. The Department is open to evaluating proposals. However, stakeholders and the Department are hamstrung by an asymmetry of expertise in these systems (something Xcel holds) and currently there is no incentive for Xcel to put the first revenue-sharing proposal forward, as there has been no determination that all revenues are, by default, ratepayer revenues. Declaring them as such will provide Xcel a strong incentive to figure out creative revenue sharing approaches for consideration.³⁹ Once there are firm and committed plans from Xcel, the Department would welcome discussions and collaboration on this topic.

Last, the Department expects that significant value, and revenue, will be derived from use of and access to the customer data, both private and aggregated. Without customer protections (including

³⁸ See Commission Docket E999/DI-20-627, CUB Comment, October 16, 2020, pg. 2-3. Doc. ID: [202010-167403-01](#) (20-627 CUB Comments)

³⁹ Fresh Energy provided examples of other utilities revenue sharing arrangements in their comments that should be considered in any cost recovery proceeding for FAN and AMI. See Fresh Energy's Comments, Docket E999/DI-20-627, pg. 2-3. Doc. ID: [20209-166863-01](#)

a requirement that all revenue from AMI and FAN, including the value of customer data, will go the ratepayer until otherwise authorized), the Department is concerned that customer and grid data (which have value and ultimately provides revenue) could be used by Xcel and third-party-partnered companies to develop and improve utility systems and programs without sharing the value of that data and those improvements with customers. While this likely a longstanding, and mutually beneficial, practice, there are two considerations that are changing this dynamic. First, aggregated customer data is becoming increasingly granular and useful, and second, it is now possible to sole-source monopoly-controlled data to a third-party entity (potentially moving into a grey-area regarding what is electricity “service”). In turn, those third-party programs could derive value from AMI and FAN and other advanced grid-related investments, creating revenue from that information, leaving the customer uncompensated by the system, operations, and personnel it funded.

We are in a situation where Xcel has launched a grid modernization investment path involving the use of specialized technologies to develop innovative service and products (via innovative utility services, or via app development and sales through the Itron app store⁴⁰) – without fully considering how Minnesota ratepayers will receive the revenue from the use of their investments and data.

Further exacerbating this concern, is the financial interest Xcel has in Energy Impact Partners (EIP). EIP is a venture capital firm investing in advanced utility grid products.⁴¹ The companies listed on EIP’s website all offer utility-specific products and services similar to programs and offerings being pursued by Xcel or are currently in use by Xcel (i.e. Ecobee and others).⁴² The Department is concerned that while there is significant value in the use and analysis of aggregated utility and customer data and in the development of advanced grid services, which third-party companies contracting with Xcel are using to develop products and offerings, there is no associated revenue provided to customers for the use of the data or return of the value in the development of those advanced grid solutions.⁴³ Historically, many of those advancements and system-improving technologies would have remained in-house at the utility (assuming both the risk and the benefit). At a minimum, Xcel does not appear to be monetizing the value in the data and creation of new services in a way to benefit customers. Xcel may be receiving and providing value from its customers’ aggregated data, in an unregulated context, by holding ownership percentages in these

⁴⁰ See Xcel’s response to Department IR 14-17 (Appendix D).

⁴¹ EIP is a private equity fund that invests in emerging technologies, products, services and business models across the full electricity supply chain from generation to consumption. EIP recently announced investments in AutoGrid Systems, which provides big data analytics and cloud computing solutions for the energy industry, and in Sense Labs, a leading home energy intelligence and management platform. <https://www.energyimpactpartners.com/>

⁴² See Xcel’s response to Department IR 45.

⁴³ But beyond the money, EIP has “hired people whose sole job is to help the partner utilities work with their portfolio companies,” he said. “That means we share sales pipelines with them, they help us with introductions to utilities, and it’s driven real tangible results.” See: <https://www.greentechmedia.com/articles/read/energy-impact-partners-681m-fundraising-by-the-numbers>

third-party companies; permitting those companies to extract value and revenue from this data and access, data and access that (only) Xcel has the ability to provide.⁴⁴

(Recommendation – Consumer Protection 2) The Commission should require all revenues and savings from AMI and FAN investments, including through accruing through the use of customer or grid data, or revenue or savings created from access to customer or grid data, belong to ratepayers unless otherwise approved by the Commission. Xcel should identify any and all instances in which its third-party contractors and/or private equity funds, derive value, benefit, or compensation from access to or use of customer and grid data, compensation for which does not accrue to Xcel’s customers.

2. Data Portability and Access Policies

a. Customer Data Access

Xcel’s investments in AMI will provide value to both the customer and the utility, both from new products and services offered or implemented and system efficiencies; this new value is largely attributable to the access and use of customer and grid data. The access to, or the restriction on, the release of this data will determine how the value is allocated.⁴⁵ CUB argued:⁴⁶

... [F]ull realization of consumer benefits from efficiency or time-shifting of usage will not occur unless consumer have convenient access to their own energy data made available by advanced meters. ...[S]hould the Commission be inclined to grant certification of the Company’s AGIS Initiative, such approval be conditioned on ensuring that consumers receive their share of the benefits of AMI – specifically, access to the energy data generated by their advanced meters, along with accompanying cost information.

As noted by the Department of Energy (DOE) Report on AMI:⁴⁷

... AMI’s capability to deliver more granular data to the consumer in a meaningful way becomes a central consideration. AMI data is not only valuable for the utility and its

⁴⁴ “[Teresa] Mogensen touted Xcel Energy’s association with an investment firm called Energy Impact Partners, a collaboration of utilities and companies designed to help shape the energy landscape of the future. [The partnership] helps the company stay aware of opportunities for strategic investments, and it serves as our eyes and ears on innovations that can help us improve,” she said. “While the companies EIP invests in are not household names, and might never be, what they have in common is the focus on using technology to transform our business.” See: <https://www.bicmagazine.com/industry/renewable-biofuel/wind-power-evs-help-xcel-energy-%E2%80%98own-the-future%E2%80%99/>. October 19, 2020.

⁴⁵ See Xcel’s response to Department IR 25 and 26 on data available to the company and data available to the customer on Day 1 and on-going.

⁴⁶ 20-627 CUB Comments, pg. 8.

⁴⁷ See Department of Energy Report, Informing the Conversation. Pg. 42-43.
https://www.smartgrid.gov/files/documents/AMI_Report_7_8_20_final_compressed.pdf

operations, but also offers value through new programs or services provided by either the utility or a third-party vendor. This adds an unusual element to a regulatory review. It is expanding the commission's and advocates' views of value. Regulators want to understand not only the value beyond that which can be achieved through utility programs, but also how access to value can be achieved more broadly. Regulators and advocates are assessing how an investment will best serve customers at large and what option might be most cost-effective for consumers, whether that is a utility solution or a third-party product or service.

AMI data can be valuable for customers, but often the level of value can depend on a customer's or third party's ability to access that information. To evaluate the value customers will realize from an investment in AMI both from utility and third-party offerings, regulators and advocates are increasingly interested in specific utility plans to provide customers access to their usage information in an easily accessible, standardized format. They want to understand what the process will be, in what format, and how customers can provide consent to third parties in order to access the customer's data?

In Xcel's November 20, 2020 Stakeholder Presentation, Xcel outlined its Data Access Policies generally, and its October 23, 2020 Presentation provided an overview of customer data access:⁴⁸

Xcel Energy Customer Data Access Practices

- Policies are rooted in the principle of Customer Control and consistent with the Minnesota Commission's framework for treatment of personally identifiable information and energy usage data
- Provides all customers direct access to their information
- Allows all customers to share their usage information multiple ways
 - With written consent
 - Download in spreadsheet format
 - Download in Greenbutton Download My Data format
 - With AMI – share with Greenbutton Share My Data
 - With AMI – via an optional Home Area Network (HAN) service
- Expecting the Commission to examine and possibly make changes to framework for energy usage data
 - Will adapt policies and practices accordingly

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⁴⁸ See Xcel's November 20, 2020 and October 23, 2020 Presentations. Doc. ID: [202011-168485-02](#) and Doc. ID: [202010-167832-01](#)

Day 1 Customer Data Availability and Access

Data Type	Latency	Access Path
15 min Historical Interval Usage Data	Updated every four hours	Customer Portal
	Updated overnight	Green Button Connect
<1min usage data (kW and kWh)	Near real time	HAN via Company Mobile App



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CUB outlined Xcel's previous commitments to customer access to Green Button Connect My Data (CMD), customer HAN data access, bring-your-own-device HAN options, and Xcel's commitment to making data available in machine readable formats. CUB recommended that Xcel materialize on these investments by 2022 as a condition of cost recovery.⁴⁹ Further, CUB recommended that Xcel be required to:⁵⁰

- Provide consumers easy access to the best available information about their energy usage through two interfaces, including both the Company's FAN and a customer's home area network;
- Provide customers and authorized third parties with access to historic billing information in a machine-readable, automated manner;
- Provide consumers and authorized third parties with rate information in standardized, machine readable formats; and
- Provide a customer authorization process that is easy for consumers to use and requires the least number of steps.

b. Open Access Data Standards

Fresh Energy summarized the use and need for Open Data Access Standards (ODAS) and noted oversight questions that stem from the use of the Itron app store.⁵¹

⁴⁹ 20-627 CUB Comments, pg. 9

⁵⁰ *Id.*

<https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={C0ABE675-0000-C518-9013-32F401963281}&documentTitle=202011-168476-01>

⁵¹ 20-627 Fresh Energy Comments, pg. 11

Enabling customers to share data with third-party service providers and enabling third party providers to use AMI data to provide real-time energy management programs will help spur innovation, expand the market for conservation and demand management programs, and may reduce program costs. The installation of AMI with distributed intelligence and the potential for an “App Store-like” platform for customer engagement raises some novel oversight questions that will be important for the Company, Commission, and stakeholders to consider.

For example, will third party energy management companies have access to real-time AMI data through an API? Will third-party programs/apps be available via Xcel/Itron’s centralized platform? How is the quality and safety of third-party programs vetted? What fees will Xcel/Itron charge third parties? How will that revenue be allocated? Fresh Energy recommends that Xcel address these questions in their request for cost recovery and invite questions and feedback from stakeholders on these issues.

As stated by CUB, the goal of adopting ODAS is to provide energy use data in ways that are useful for third parties, while not unduly burdening utilities and associations, and in ways that protect the privacy of individual customers.

CUB recommended that Xcel should be required to provide a set of open data access standards that would create the ability for third parties to access sets of customer energy use data, either aggregated or anonymized. However, as such standards are currently under consideration in Docket No. E,G999/M-19-505, CUB made no additional recommendation as to their application relative to Xcel’s AGIS cost recovery.⁵²

The Department recognizes these on-going questions and concerns. Customer data access and interface are integral aspects of AMI-DI implementation, and should be continually evaluated as the uses and functionalities of the technologies are developed. The Department expects that these issues will continue to be explored, given the interplay between Docket No. E,G999/M-19-505 (Privacy and Customer Data Proceeding) and customer data access/interface issues surrounding AMI-DI/HAN. The Department commits to further exploring these issues with stakeholders in the Privacy and Customer Data Proceeding, including evaluating and establishing conditions that will guide the interaction between the use of, and access to, the AMI-DI data, together with the associated customer protections. The Department believes that a consumer protection framework should be established that requires Xcel to develop and participate in the Privacy and Customer Data Proceeding.

(Recommendation – Consumer Protection 3) The Commission should require, as a consumer protection requirement and as a measure to advance the Privacy and Customer Data docket, Xcel to provide a comprehensive framework in E,G999/M-19-505 for assessing:

⁵² 20-627 CUB Comments, pg. 9

1. HAN, AMI and AMI-DI specifications and related customer data access policies,
2. bring-your-own device HAN requirements and terms,
3. potential terms and conditions for third-party data access to AMI, AMI-DI or HAN
4. methods to provide customers equal access to the level of data available to the utility, and
5. a summary of industry customer data access standards.

3. Cost Caps and Recovery Methodology

This discussion of cost caps is provided in the context of rider recovery. There are two considerations that should be made regarding cost caps, first, what should the amount of the cap be, and second, how should costs that ultimately are above or below the cost cap be treated.

As the Department has argued previously, the ability to set cost caps (soft or hard caps) is an outcome of an alternatives analysis and the scoping process. The Department continues to support the establishment of a cap, for both fixed and variable costs, and with the cap value to be determined during, and based on, the record development of the Initial AMI/FAN Cost Recovery Proceeding. It is expected that significant information and analysis will be conducted in that record, and the Department has received responses for industry expert assistance in that evaluation.

According to comments filed by Xcel in the TCR Procedure Comment Period, Xcel does not believe that cost caps are reasonable, arguing that grid modernization investment are unique due to the type, scope and nascent nature of the investments.⁵³ Additionally, Xcel disagrees with the Department's comparison of AMI and FAN to other rider-eligible investments, like a high-voltage transmission line or power plant – however, the Department concludes that cost caps are reasonable *especially* and even more importantly, for the reasons Xcel argues. The Office of the Attorney General – Residential Utilities Division (OAG) argued that a cap for a traditional TCR project applies with equal force to AMI and FAN because of the large cost involved; further, the Commission “should cap rider recovery at Xcel’s initial estimates [in the certification proceeding] to encourage fiscal discipline and align the Company’s incentives with ratepayer interests.”⁵⁴

Cost caps are not meant to preclude cost recovery of amounts over the cap, they are simply removing a favorable rate treatment when Xcel goes over the cost estimate used at the time of project approval. Regardless, the Department believes that the magnitude of these investments, the associated risks, the potential for significant cost overruns, and concern that cost overages could be

⁵³ 20-680 Xcel Reply, pg. 12; also see Xcel’s response to Department IR 42 which argues that AMI and FAN investments and cost recovery “is no different than any other investment the Company would make, such as a power plant or a transmission line. In general, the cost recovery is based on the timing of the investments, the assets being used and useful, and a determination that the costs are prudent.”

⁵⁴ See OAG Comments, Docket E999/DI-20-627, October 16, 2020, pg. 15-16. DEPARTMENTID: [202010-167697-01](#) (20-627 OAG Comments)

less than transparent due to the overlapping functionalities of the projects, argues for increased oversight, not less, of the investments.⁵⁵

CUB provided proposed approaches to cost recovery, both for fixed and variable costs in their comments. While the Department continues to support the cost cap concept as established for rider investments in a 2009 Commission Order, it expects there will be further discussion of this issue in the Initial AMI/FAN Cost Recovery Proceeding.⁵⁶ The OAG indicated that the Commission should not establish an incentive mechanism (rewards or penalties) without having established baseline performance data and trends.⁵⁷

(Recommendation – Consumer Protection 4) The Commission should establish cost caps based on the information that will be provided in Xcel’s Initial AMI/FAN Cost Recovery Proceeding, including consideration of the required alternatives analysis. In the Initial AMI/FAN Cost Recovery Proceeding, the Commission should require parties to consider the proposed costs for the investments that were projected by Xcel at the time of certification.

4. Home Area Network

Xcel’s AMI and FAN proposals provide some level of detail regarding the proposed Home Area Network (HAN) and related integration with a customer’s home or business, however, several details remain to be determined. In a Colorado proceeding related to AMI-DI and FAN investments, parties agreed, through a settlement agreement, to an additional proceeding to evaluate whether Xcel’s HAN connection provisions (and related issues) were prudent.⁵⁸ Ultimately, the Colorado Commission determined that Xcel’s plans in activating the HAN were consistent with industry standards and best practices (as of early 2018), appropriately addressed cost and cybersecurity risks, and simplified customer engagement sufficient to demonstrate that the Company is striving to provide easy data access to the extent prudent. The findings footnote that Xcel will allow customers to active up to 16 of their own ZigBee SEP 1.1 communications protocol devices for connection to the AMI meter. The Department notes that this protocol has now changed to the Wifi based SEP 2 protocol which has not received the same level of vetting in Colorado.⁵⁹

As noted by the Department of Energy (DOE) in their report on AMI:⁶⁰

⁵⁵ 20-627 CUB Comments, pg. 4 - Ascribing functionalities to cost caps is necessary to ensure performance of articulated benefits (if overruns are encountered, functionalities may be removed to stay on budget).

⁵⁶ See Order point 4, *Order Approving 2010 TCR Project Eligibility and Rider, 2009 TCR Tracker Report, and TCR Rate Factors*, Docket E002/M-09-1048.

⁵⁷ 20-627 OAG comments, pg. 14.

⁵⁸ See Colorado Public Service Commission, Docket 18A-0194E.

⁵⁹ See Xcel’s response to Department IR 26 and 35.

⁶⁰ See Department of Energy Report, *Informing the Conversation*. Pg. 43.

https://www.smartgrid.gov/files/documents/AMI_Report_7_8_20_final_compressed.pdf

In this context, many regulators raised concerns about the ability of the consumer to utilize the Home Area Network (HAN) capabilities of the AMI system. The ability of the meter to communicate in realtime with the consumer devices through a HAN system is a benefit where customers can see value most directly because it allows an instantaneous feed of usage information and event notification (such as for demand response) directly to the customer's devices. Regulators saw this is an opportunity to give the customer greater control of their usage and to enable additional product offerings to customers.

At this time the Department does not propose an independent investigation for these topics, but believes that the detail that will be provided in the cost recovery proposal will determine whether additional proceedings are needed.⁶¹ Data access issues are discussed above.

D. Customer Protections – Additional Filings

As noted in Xcel's 2019 IDP and in response to the Department's IR 9, Xcel proposes to file several additional AMI-related filings for Commission review: customer AMI opt-out provisions (pending before Commission); AMI billing , remote connect/disconnect; pre-pay options; and related service quality and metric filings. Xcel noted that it understands that more filings would likely be required by the Commission.^{62,63}

1. Products and Services Overview

Xcel provided an overview of over 20 potential programs in its 2019 IDP (Gesack Direct, Schedule 7). Xcel expects that each program and offering listed will have a benefit to the customer, utility, or both (grid or customer facing). The Department that, in its cost recovery proposal, Xcel provide more detail on each program, particularly on the Day 1 and near-term programs. It is anticipated that Xcel's cost recovery filing would include information on program cost estimates, anticipated savings or outcomes (or dependencies of those factors), discussion of Xcel's third-party contractors for each program, etc. Since these products and services are new, stakeholders will likely have questions or input on what additional information would be reasonable to be provided and Xcel may want to reach out to stakeholders for input.

Xcel conducted a two-hour stakeholder meeting on a myriad of topics on November 20, 2020 – with roughly 20 minutes spent on a product and services overview. The overview chart provides an illustration of the potential programs:⁶⁴

⁶¹ See Mission:Data Coalition Presentation, October 23, 2020, (Appendix C).

⁶² See Xcel's response to Department IR 10 for AMI-related plans Xcel considers needing Commission approval (outside of costs).

⁶³ See Docket E002/M-20-592 and Xcel's response to Department IR 11 (Appendix D) which notes that privacy related opt-outs are related to real time data collection. This is an active area of discussion in Docket M-20-592.

⁶⁴ Xcel's November 20, 2020 Presentation. Doc ID: [202011-168485-02](#)

Product and Service Roadmap

	DAY ONE (2022)	NEAR TERM (2022-2025)	FUTURE (2025+)
ENHANCE THE EXPERIENCE	<ul style="list-style-type: none"> • Energy Usage Dashboard • Enhanced Web and Mobile Apps • Enhanced Outage Notifications • Green Button Connect My Data 	<ul style="list-style-type: none"> • Emergency and Safety Notifications • Energy Usage Alerts and Notifications • Personalized Notifications • Power Quality Analysis 	<ul style="list-style-type: none"> • Artificial Intelligence Enabled Notifications • Smart Premise Restoration • Enhanced Microgrid Integration • Smart Safety Disconnect
KEEP BILLS LOW	<ul style="list-style-type: none"> • Virtual Energy Audits • Enhanced Communication Options with Behind the Meter Systems 	<ul style="list-style-type: none"> • Whole Facility Monitoring • Rate Advisor • Time Varying Rates 	<ul style="list-style-type: none"> • Smart Rates • Enhanced Automated Demand Response
CLEAN ENERGY		<ul style="list-style-type: none"> • Demand management optimization • Enhanced access to battery storage and electric vehicles • Green notifications and controls • Enhanced DER enablement 	

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No recommendation is made explicitly on this item, but the Department would like to see expanded detail on these offerings in any future cost recovery proposal (as articulated by other stakeholders in comments) and improved tracking of the product and services development – including stakeholder feedback, anticipated filing date with the Commission, if planned, and acknowledgement if not (see the On-Going Reporting section, below).

2. Other Programs

Fresh Energy suggested five areas that Xcel should explore in future filings and program offerings and a proposed chart for their implementation.⁶⁵

⁶⁵ 20-627 Fresh Energy Comments, pg. 11

Table 1: Preliminary Recommendations on Timing of Design, Proposal, and Implementation of AMI-enabled programs and services

Program/Service	Design	File for Approval	Implement
Remote connect/disconnect	Ongoing	With initial AMI cost recovery petition	Concurrently with AMI installation
Advanced TOU rates and flexible pricing pilots	Ongoing	Ongoing	Suite of new C&I and residential rates in place by/before completion of AMI installation
Other AMI-enabled conservation programs: - Real time feedback - Targeted marketing and technical assistance - M&V 2.0	2020	2021-23	By completion of AMI installation
Advanced demand management: - Grid-interactive efficient buildings - Pay for performance	2021-23	2021-23	TBD
Third party service and data sharing	Initial plans in request for cost recovery, refined with stakeholder feedback	One year before launch of app-store and/or behavior-based programs	Concurrently with launch of app-store and/or behavior-based programs
Improved forecasting	Ongoing	Not necessary	Concurrently with AMI installation
Improved geo-targeting for distribution capacity deferrals	2021-23	With any future NWA proposals	With any future NWA proposals

Some of these items are touched on in Xcel's programs and services overview, but some are not (pay for performance programs, grid-interactive buildings). Given the direct link between AMI and FAN functionalities, customer benefits, and cost, it would be useful to have an expanded discussion in the cost recovery proceeding about potential future filings and program offerings. Potentially, and a stand-alone investigation proceeding may be warranted (to be determined in the cost recovery proceeding), depending on the level of information provided by Xcel in its initial cost recovery filing.

- Near-real-time energy use feedback to customers (discussed in Section IV.C.2.)
- Grid-interactive efficient buildings
- Pay for performance programs
- Targeting program design, marketing, and technical assistance using AMI data
- Enhanced measurement and verification of energy efficiency and demand management programs (e.g. Lawrence Berkeley National Laboratory's M&V 2.0) to improve program design over time

E. Proposed Metrics

In development of this report, stakeholders provided feedback on what metrics should be used in relation to Xcel's AMI and FAN investments. Specifically, input was sought on the following topics:

1. What metrics should be established and what should be considered in development
2. What are specific, accountable metrics for AMI and FAN
3. What baseline data or targets should be considered
4. Whether any other utilities or states provided useful frameworks
5. When should metrics be established
6. Whether the metrics proposed by Xcel in the 2019 IDP were sufficient
7. How metrics should align with other Commission metric-related dockets

1. Establishment of Metrics

Thorough input was received from stakeholders on this issue. All stakeholders, except Xcel, conclude that the metrics provided in Xcel's 2019 IDP are a good start, but are insufficient. Xcel continues to believe that its previously proposed metrics remain sufficient and will provide the Commission and stakeholders "comprehensive information on deployment progress for monitoring purposes, and performance and achievement of customer and system benefits as we implement the advanced grid initiatives."⁶⁶

No stakeholder voiced opposition to the creation of metrics for AMI and FAN.

2. Considerations for Metrics

Stakeholders provided the following input on the creation of metrics:

- Metrics should be tailored to phases of the project implementation⁶⁷
- Metrics should be applied, as relevant, to multiple facets of the project, including: schedule, cost, installation/deployment success, investment performance, customer outreach and education, customer engagement, customer-sited asset effectiveness
- Metrics, baselines, and the timeline for achieving the targeted improvement should be established prior to cost recovery

⁶⁶ 20-627 Xcel Comments, pg. 4

⁶⁷ While not detailed here, the Department expects that Xcel will propose integration, interoperability, and DI-Platform performance metrics when it files its request for cost recovery. Xcel's 2019 IDP and Harkness Direct Testimony at pg. 54 discusses system integration needs. Xcel's response to the Department's IR 36 provides additional context on the risk of system failures to integrate the technology or systems. Some of the integration requirements are required of Itron, some are already being implemented through the Colorado service territory roll-out of AMI-DI and some will be integrated by Xcel personnel. Some level of metric for completion and success of integration of the required components will be useful to monitor in quarterly and annual reports. However, the Department is not in a position to provide an initial framework for what those may be and believes some metrics should be proposed in the cost recovery proceeding and reviewed by stakeholders.

- High priority metrics should be considered (metrics that tie to high-value customer benefit or track harder-to-achieve benefits where incentives may be useful)⁶⁸
- Metric incentives or penalties may be useful for some metrics⁶⁹
- Metric importance may depend on cost and contribution to the cost benefit analysis

Most stakeholders indicated that discrete phases of metrics would be required, generally categorizing metrics into pre- and post-AMI deployment metrics.

In addition to measurable metrics and discrete metrics proposed by stakeholders, the Department encourages the use of “soft” metrics regarding Xcel’s ability to effectively engage stakeholders in advance of, and throughout, complex proceedings. It has been thoroughly articulated through input received via this stakeholder report process and via the previous certification docket (and other on-going dockets) that Xcel’s decisions as to the timing of its petitions, the level of transparency involved in the development of its petitions, how collaborative it is with stakeholders, the clarity of its filings, and whether Xcel minimizes confusion (or simply does not seek to reduce it), are all factors that can impact the quality and level of support behind Xcel’s filings, and the speed at which programs and services are implemented. The success of many of the customer-facing benefits that are likely to stem from Xcel’s advanced grid investments are directly related to actions by Xcel, actions that are impacted by many of the factors listed above. Without significant effort by Xcel in these areas, there is concern about the ability of Xcel to fully implement programs upon which the Company has claimed benefits for these investments. Assessing soft metrics such as process clarity, filing transparency (both in the filing and advanced notice of the filing to stakeholders), level of stakeholder collaboration or opposition, and other factors that could streamline or stifle future offerings would provide Commissioners insight into whether metric- and rider-based authorizations for distribution grid investments are tenable for the future. Putting Xcel on notice of the importance of soft metrics would provide Xcel an incentive to find methods to reduce process ambiguity, reduce stakeholder/process confusion, enhance and establish stakeholder relationships, create innovative, customer-focused solutions, and last, would place the burden on Xcel (the entity in control of the majority of information in these proceedings) to foster a collaborative stakeholder atmosphere.

In light of the likelihood that review of these investments will occur through a favorable rate-treatment rider process, including these nearer term ‘soft’ metrics will assist the Department, stakeholders, and the Commission in assessing whether the costs of these investments are suitable for initial, or continued, inclusion in the rider.

(Recommendation – Metrics 1) The Commission should consider, in future cost recovery requests and rider use, whether Xcel has attempted, and successfully provided, process clarity, stakeholder input, and transparency in its plans, filings and programs.

⁶⁸ Fresh Energy Comments, pg. 7

⁶⁹ Id.

3. Alignment with Other Dockets and Evolution Over Time

The establishment of metrics is a topic that is active in at least two Commission proceedings, the Performance Based Metrics docket and the Safety, Reliability and Service Quality docket(s). There is broad stakeholder consensus that metrics for the AMI and FAN investments should be aligned with those proceedings and refined for use in the respective cost recovery proceedings. As noted by Fresh Energy, “[t]he expertise of parties in the AGIS proceedings is relevant for robust consideration of metrics and incentives. We also believe developing metrics and incentives in the related cost recovery dockets will result in more appropriate timelines and more robust record development.”⁷⁰ It is expected that through the process recommended in this report, that the Commission would consider in future years (post-deployment) alignment or integration with other metric-related dockets.

4. Proposed Metrics

Attached to this report, in Appendix E, is a summary of Xcel’s, CUB’s, and Fresh Energy’s proposed metrics. The Department found this collective list a reasonable list of metrics to use as a baseline for setting metrics at the time of the Initial AMI/FAN Cost Recovery Proceeding. As noted at the beginning of this report, it is expected that these metrics will need to either be refined or modified (or additional metrics created) upon review of Xcel’s Initial AMI/FAN Cost Recovery Proceeding.

Without further information on Xcel’s final scope and framework, it is not possible to establish or create finalized requirements or metrics.

Additionally, some level of Commission input or guidance as an initial baseline will be needed (in conjunction with a completeness and scope determination) at the onset of the Initial AMI/FAN Cost Recovery Petition; this baseline setting would provide stakeholders a directional and focused review. Additionally, preliminary guidance from the Commission would allow Xcel time to propose targets and begin collection of relevant baseline data.

(Recommendation - Metrics 2) At the completeness/scoping decision on Xcel’s Initial AMI/FAN Cost Recovery Petition, the Commission should require parties to use Appendix E – Metrics as the baseline for consideration in the cost recovery proceeding. Final metrics should be established upon the conclusion of the Initial AMI/FAN Cost Recovery Proceeding, with the understanding that the metrics are expected to change and adapt as the project seeks recovery of additional costs and project functionalities.

⁷⁰ Fresh Energy Comments, pg. 8

F. Methods to Evaluate Performance - On-Going Reporting Requirements

Generally, stakeholders are in alignment with Xcel's general framework to provide an annual report on its AMI and FAN progress; this report could be used as a process to review and evaluate performance on an ongoing basis. It is likely that this report (Advanced Grid Infrastructure Annual Report), depending on its final structure and requirements, would provide an over-arching view on progress on AMI-related programs, services, or required frameworks or plans.

The Advanced Grid Infrastructure Annual Report could be used as a data point in any adjunct cost recovery request to evaluate capital costs in early stages, capital and operations and maintenance costs mid-point, and to be considered jointly or potentially transition to the Performance Based Metrics proceeding in the long-term. Reporting should terminate when the Commission deems it reasonable.⁷¹

An annual report will be a critical tool for evaluation of the proposed programs or services, as well as to assess AMI-DI's ability to accommodate those programs and services. AMI-DI meters are like any device, and they have a limit to the number of programs that can be housed on the meter and run at one time. Xcel noted on its latest stakeholder webinar on November 20, 2020 that the Itron RIVA Gen 4.2 meters have limited processing and storage bandwidth (like any computer) in both random access memory (RAM) and read-only memory (ROM).⁷² As each program chosen from the Itron application development store will require a certain bandwidth on the AMI-DI, there may ultimately be an inherent tension between which programs (benefitting the customer, the utility, or both) will be used.⁷³ Additionally, these programs will be competing for space and cost to transmit data over the final communication network chosen. Therefore, on-going monitoring and reporting will be needed, as noted below.

The Department agrees with stakeholders' input and recommends that the Advanced Grid Infrastructure Annual Report should include, at a minimum, the following:

1. Update on the project scope and intended functionalities (including percentage of budget spent) and plan for upcoming year, including actual capital and operations and maintenance costs/savings incurred⁷⁴

⁷¹ Id, pg. 15

⁷² Xcel provided on the webinar that in its AMI-DI purchase agreement, it upgraded memory to 2.0 GB from Itron's standard offering of 1.0 GB to ensure sufficient capacity.

⁷³ See Xcel's response to Department IR 18, 19, 20, 21, and 23. (Appendix D)

⁷⁴ This reporting requirement was partially proposed by CUB. In CUB's proposed language it included 'deferred' costs incurred. However, since no costs have been approved for deferral related to these investments, the Department does not include the related language. See 20-627 CUB, pg. 10.

2. AMI and FAN implementation (installation and integration) progress compared to planned timeline (until full operation)
3. AMI-related product and services offering overview and listing, including any modifications to those offerings, a summary of implementation progress, and a three-year plan
4. AMI-related plans (required filings, related offerings or programs, etc.), and status
5. AMI metrics report: progress on current metrics, baseline data gathering progress, baseline data updates, and updates on metrics or targets

Additionally, Fresh Energy and CUB suggested requiring quarterly reports, which the Department supports. These quarterly reports would report on AMI and FAN metrics, including:

- Expectations of future reports (also see CUB page 8)
 - Dashboard update of programs and services enabled by AMI and FAN
 - Progress, issues, expectations, forthcoming filings, status
 - Timeline and expectations of customer and other programs

Last, due to the alignment of the information in the Advanced Data Management System (ADMS) annual report, and the Advanced Grid Infrastructure Annual Report, as well the need to align and be able to inform the Integrated Distribution Plan, Hosting Capacity Analysis Report, Demand Response Annual Report and Transmission Cost Recovery Riders (and potentially other dockets) – the Commission may wish to consider whether to align all of these report deadlines, consolidate these reports under the heading of the IDP or other type of collective, or use the Advanced Grid Infrastructure Annual Report to simply track all of Xcel’s advanced grid-related products, services, and related proceedings, as appropriate.⁷⁵

(Recommendation - Consumer Protection 5) Consumer Protection Recommendation: Require Xcel to file an Advanced Grid Infrastructure Annual Report including, at a minimum, items 1 – 5 listed above, and a quarterly report on metrics and baseline data.

⁷⁵ See 20-627 Fresh Energy Comments, pg. 16 and related dockets: E002/M-17-797, M-20-421, M-19-685, E002/M-18-251/19-666, et.al.

V. Recommendations

General Recommendation

1. Prior to initiation of a cost recovery proceeding (or at a completeness review of the a cost recovery filing) the Commission should approve, reject, or modify the Department's recommendations for methods to evaluate performance, and establish metrics and customer protections or, at a minimum, establish baseline considerations to be evaluated in the cost recovery petition.

Customer Protections

1. Require Xcel file as part of its Initial AMI and FAN Cost Recovery Petition its project scope of the AMI and FAN projects, including a complete, clear and concise description of the equipment, functionalities, capabilities, goals, timelines, and costs. The project and cost recovery proceeding scope should be defined by the Commission prior to or during a completeness review of the initial cost recovery proceeding.
2. The Commission should require all revenues and savings from AMI and FAN investments, including those accruing through the use of customer or grid data, or revenue or savings created from access to customer or grid data, belong to ratepayers unless otherwise approved by the Commission. Xcel should identify any and all instances in which its third-party contractors and/or private equity funds, derive value, benefit, or compensation from access to or use of customer and grid data, compensation for which does not accrue to Xcel's customers.
3. The Commission should require, as a consumer protection requirement and as a measure to advance the Privacy and Customer Data docket, Xcel must provide a comprehensive framework in E,G999/M-19-505 for assessing:
 1. HAN, AMI and AMI-DI specifications and related customer data access policies,
 2. bring-your-own device HAN requirements and terms,
 3. potential terms and conditions for third-party data access to AMI, AMI-DI or HAN
 4. methods to provide customers equal access to the level of data available to the utility, and
 5. a summary of industry customer data access standards.
4. The Commission should establish cost caps based on the information that will be provided in Xcel's Initial AMI/FAN Cost Recovery Proceeding, including consideration of the required alternatives analysis. In the Initial AMI/FAN Cost Recovery Proceeding, the

Commission should require parties to consider the proposed costs for the investments that were projected by Xcel at the time of certification.

5. The Commission should require Xcel to file an Advanced Grid Infrastructure Annual Report on including, at a minimum, items 1 – 5 listed in Section F above, and a quarterly report on metrics and baseline data.

Metrics

1. The Commission should consider, in future cost recovery requests and rider use, whether Xcel has attempted, and successfully provided, process clarity, stakeholder input, and transparency in its plans, filings and programs.
2. At the completeness/scoping decision on Xcel's Initial AMI/FAN Cost Recovery Petition, the Commission should require parties to use Appendix E – Metrics as the baseline for consideration in the cost recovery proceeding. Final metrics should be established upon the conclusion of the Initial AMI/FAN Cost Recovery Proceeding, with the understanding that the metrics are expected to change and adapt as the project seeks recovery of additional costs and project functionalities.

CERTIFICATE OF SERVICE

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

**Minnesota Department of Commerce
Report**

Docket No. E002/M-19-666 and E999/DI-20-627

Dated this 1st day of December 2020

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Jeffrey C	Paulson	jeff.jcplaw@comcast.net	Paulson Law Office, Ltd.	4445 W 77th Street Suite 224 Edina, MN 55435	Electronic Service	No	OFF_SL_19-666_Official

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Joyce	Peppin	joyce@mrea.org	Minnesota Rural Electric Association	11640 73rd Ave N Maple Grove, MN 55369	Electronic Service	No	OFF_SL_19-666_Official
Mary Beth	Peranteau	mperanteau@wheelerlaw.com	Wheeler Van Sickle & Anderson SC	44 E. Mifflin Street, 10th Floor Madison, WI 53703	Electronic Service	No	OFF_SL_19-666_Official
Jennifer	Peterson	jjpeterson@mnpower.com	Minnesota Power	30 West Superior Street Duluth, MN 55802	Electronic Service	No	OFF_SL_19-666_Official
Hannah	Polikov	hpolikov@aee.net	Advanced Energy Economy Institute	1000 Vermont Ave, Third Floor Washington, DC 20005	Electronic Service	No	OFF_SL_19-666_Official
David G.	Prazak	dprazak@otpc.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380496	Electronic Service	No	OFF_SL_19-666_Official
Gregory	Randa	granda@lakecountrypower.com	Lake Country Power	26039 Bear Ridge Drive Cohasset, MN 55721	Electronic Service	No	OFF_SL_19-666_Official
Mark	Rathbun	mrathbun@greenergy.com	Great River Energy	12300 Elm Creek Blvd Maple Grove, MN 55369	Electronic Service	No	OFF_SL_19-666_Official
Michael	Reinertson	michael.reinertson@avanteenergy.com	Avant Energy	220 S. Sixth St. Ste 1300 Minneapolis, Minnesota 55402	Electronic Service	No	OFF_SL_19-666_Official
John C.	Reinhardt	N/A	Laura A. Reinhardt	3552 26th Ave S Minneapolis, MN 55406	Paper Service	No	OFF_SL_19-666_Official

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	Yes	OFF_SL_19-666_Official
Kevin	Reuther	kreuther@mncenter.org	MN Center for Environmental Advocacy	26 E Exchange St, Ste 206 St. Paul, MN 551011667	Electronic Service	No	OFF_SL_19-666_Official
Isabel	Ricker	ricker@fresh-energy.org	Fresh Energy	408 Saint Peter Street Suite 220 Saint Paul, MN 55102	Electronic Service	No	OFF_SL_19-666_Official
Amanda	Rome	amanda.rome@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 5 Minneapolis, MN 55401	Electronic Service	No	OFF_SL_19-666_Official
Robert K.	Sahr	bsahr@eastriver.coop	East River Electric Power Cooperative	P.O. Box 227 Madison, SD 57042	Electronic Service	No	OFF_SL_19-666_Official
Richard	Savelkoul	rsavelkoul@martinsquires.com	Martin & Squires, P.A.	332 Minnesota Street Ste W2750 St. Paul, MN 55101	Electronic Service	No	OFF_SL_19-666_Official
Thomas	Scharff	thomas.scharff@versoco.com	Verso Corp	600 High Street Wisconsin Rapids, WI 54495	Electronic Service	No	OFF_SL_19-666_Official
Larry L.	Schedin	Larry@LLSResources.com	LLS Resources, LLC	332 Minnesota St, Ste W1390 St. Paul, MN 55101	Electronic Service	No	OFF_SL_19-666_Official
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Kay	Schraeder	kschraeder@minnkota.com	Minnkota Power	5301 32nd Ave S Grand Forks, ND 58201	Electronic Service	No	OFF_SL_19-666_Official
Dean	Sedgwick	Sedgwick@Itascapower.com	Itasca Power Company	PO Box 455 Spring Lake, MN 56680	Electronic Service	No	OFF_SL_19-666_Official
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Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th PI E Ste 350 Saint Paul, MN 55101	Electronic Service	No	OFF_SL_19-666_Official
Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix And Associates	7400 Lyndale Ave S Ste 190 Richfield, MN 55423	Electronic Service	Yes	OFF_SL_19-666_Official
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Doug	Shoemaker	dougs@charter.net	Minnesota Renewable Energy	2928 5th Ave S Minneapolis, MN 55408	Electronic Service	No	OFF_SL_19-666_Official
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Ken	Smith	ken.smith@ever-greenenergy.com	Ever Green Energy	305 Saint Peter St Saint Paul, MN 55102	Electronic Service	No	OFF_SL_19-666_Official
Trevor	Smith	trevor.smith@avantenergy.com	Avant Energy, Inc.	220 South Sixth Street Suite 1300 Minneapolis, Minnesota 55402	Electronic Service	No	OFF_SL_19-666_Official
Ken	Smith	ken.smith@districtenergy.com	District Energy St. Paul Inc.	76 W Kellogg Blvd St. Paul, MN 55102	Electronic Service	No	OFF_SL_19-666_Official
Beth H.	Soholt	bsoholt@windonthewires.org	Wind on the Wires	570 Asbury Street Suite 201 St. Paul, MN 55104	Electronic Service	No	OFF_SL_19-666_Official
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Pat	Treseler	pat.jcplaw@comcast.net	Paulson Law Office LTD	4445 W 77th Street Suite 224 Edina, MN 55435	Electronic Service	No	OFF_SL_19-666_Official
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Lisa	Veith	lisa.veith@ci.stpaul.mn.us	City of St. Paul	400 City Hall and Courthouse 15 West Kellogg Blvd. St. Paul, MN 55102	Electronic Service	No	OFF_SL_19-666_Official
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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LORI	CLOBES	lclobes@mienergy.coop	MiEnergy Cooperative	31110 COOPERATIVE WAY PO BOX 626 RUSHFORD, MN 55971	Electronic Service	No	OFF_SL_20-627_DI-20-627
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Ray	Choquette	rchoquette@agp.com	Ag Processing Inc.	12700 West Dodge Road PO Box 2047 Omaha, NE 68103-2047	Electronic Service	No	OFF_SL_20-627_DI-20-627
John	Coffman	john@johncoffman.net	AARP	871 Tuxedo Blvd. St. Louis, MO 63119-2044	Electronic Service	No	OFF_SL_20-627_DI-20-627
Kenneth A.	Colburn	kcolburn@symbioticstrategies.com	Symbiotic Strategies, LLC	26 Winton Road Meredith, NH 32535413	Electronic Service	No	OFF_SL_20-627_DI-20-627
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_20-627_DI-20-627
Riley	Conlin	riley.conlin@stoel.com	Stoel Rives LLP	33 S. 6th Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_20-627_DI-20-627

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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George	Crocker	gwillc@nawo.org	North American Water Office	PO Box 174 Lake Elmo, MN 55042	Electronic Service	No	OFF_SL_20-627_DI-20-627
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David	Dahlberg	davedahlberg@nweco.com	Northwestern Wisconsin Electric Company	P.O. Box 9 104 South Pine Street Grantsburg, WI 548400009	Electronic Service	No	OFF_SL_20-627_DI-20-627
James	Denniston	james.r.denniston@xcenergy.com	Xcel Energy Services, Inc.	414 Nicollet Mall, 401-8 Minneapolis, MN 55401	Electronic Service	No	OFF_SL_20-627_DI-20-627
Curt	Dieren	curt.dieren@dgr.com	L&O Power Cooperative	1302 S Union St Rock Rapids, IA 51246	Electronic Service	No	OFF_SL_20-627_DI-20-627
Carlton	Doyle Fontaine	carlton.doyle.fontaine@senate.mn	MN Senate	75 Rev Dr Martin Luther King Jr Blvd Room G-17 St Paul, MN 55155	Electronic Service	No	OFF_SL_20-627_DI-20-627
Brian	Draxten	bhdraxten@otpc.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380498	Electronic Service	No	OFF_SL_20-627_DI-20-627
Brian	Edstrom	briane@cubminnesota.org	Citizens Utility Board of Minnesota	332 Minnesota St Ste W1360 Saint Paul, MN 55101	Electronic Service	No	OFF_SL_20-627_DI-20-627
Kristen	Eide Tollefson	healingsystems69@gmail.com	R-CURE	28477 N Lake Ave Frontenac, MN 55026-1044	Electronic Service	No	OFF_SL_20-627_DI-20-627

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Todd	Headlee	theadlee@dvigridsolutions.com	Dominion Voltage, Inc.	701 E. Cary Street Richmond, VA 23219	Electronic Service	No	OFF_SL_20-627_DI-20-627
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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