

May 2, 2022

PUBLIC DOCUMENT

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

RE: **PUBLIC Reply Comments of the Minnesota Department of Commerce, Division of Energy Resources**
Docket No. E002/M-21-814 and E002/M-20-680

Dear Mr. Seuffert:

Attached are the **PUBLIC** reply comments of the Minnesota Department of Commerce, Division of Energy Resources (Department) in the following matter:

In the Matter of Northern States Power Company d/b/a Xcel Energy's Petition for Approval of the Transmission Cost Recovery Rider Revenue Requirements for 2021 and 2022, Tracker True-up and Revised Adjustment Factors

The Petition was filed on November 24, 2021 by:

Holly Hinman
Regulatory Manager
Xcel Energy
414 Nicollet Mall, 401 – 7th Floor
Minneapolis, MN 55401

The Department recommends that the Minnesota Public Utilities Commission (Commission) adopt the agreement that the Department and Xcel Energy have reached regarding the procedural review of Xcel Energy's 2021-2022 Transmission Cost Recovery Rider petition. The Department is available to answer any questions the Commission may have.

Sincerely,

/s/ Matthew Landi
Rates Analyst

/s/ Nancy Campbell
Financial Analyst, CPA

ML/NC/ja
Attachment



Before the Minnesota Public Utilities Commission

PUBLIC Reply Comments of the Minnesota Department of Commerce Division of Energy Resources

Docket No. E002/M-21-814 and E002/M-20-680

I. BACKGROUND

On November 24, 2021, Xcel Energy (Xcel, or the Company) filed its 2021-2022 Transmission Cost Recovery (TCR) Rider petition in which the Company seeks approval of its 2021-2022 TCR Rider revenue requirements and resulting rate classes' adjustment factors (Xcel's 2021-2022 TCR Rider petition).

Xcel's 2021-2022 TCR Rider petition proposed a 2022 TCR Rider revenue requirement of approximately \$104.5 million, an increase of approximately \$22.6 million over 2020 revenue requirements of approximately \$81.9 million.¹ Xcel's proposed revenue requirements and the resulting adjustment factors were calculated with an assumed implementation date of June 1, 2022, and the Company is proposing to recalculate the adjustment factors for implementation in compliance based on the timing of a Commission decision.

Through Xcel's 2021-2022 TCR Rider, the Company is proposing to recover the following:²

- Costs associated with distribution-grid modernization projects previously certified by the Commission and eligible for TCR cost recovery, as follows:
 - o The ADMS Project;
 - o The AMI Project;
 - o The FAN Project;
 - o The TOU Rider Pilot; and
 - o The APT/LoadSEER project.
- Costs associated with transmission projects previously approved for TCR Rider recovery, including:³
 - o CapX2020 Fargo – Twin Cities;
 - o CapX2020 La Crosse;
 - o CapX2020 Brookings – Twin Cities;

¹ *In the Matter of the Petition of Northern States Power Company for Approval of the Transmission Cost Recovery Rider Revenue Requirements for 2021 and 2022, Tracker True-up, and Revised Adjustment Factors*, Xcel's Transmission Cost Recovery Rider Petition (Xcel's 2021-2022 TCR Rider Petition), Docket No. E002/M-21-814, November 24, 2021. Accessed at (PUBLIC):

<https://efiling.web.commerce.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={D031537D-0000-C911-9323-7302B00603AD}&documentTitle=202111-180141-01.>

² Xcel's 2021-2022 TCR Rider Petition, at 1-2.

³ Xcel's 2021-2022 TCR Rider Petition, Attachment 1.

- La Crosse – Madison (also referred to as Badger – Coulee);
- Big Stone-Brookings 345 kV Line; and
- Huntley-Wilmarth 345 kV Transmission Line.

On February 7, 2022, the Commission issued a Notice of Comment Period for Xcel's 2021-2022 TCR Rider Petition (TCR Rider Notice) and the related Procedural Paths Proceeding.

On February 9, 2022, the Department submitted a letter in the instant proceeding (Department's Letter), as well as several other related distribution system planning and grid modernization proceedings.⁴ The Department's Letter explains that the Department retained Synapse Energy Economics, Inc. (Synapse) in response to the Commission's September 27, 2019 Order in Docket No. E002/M-17-797 requesting that the Department secure specialized technical professional investigative services to investigate the potential costs and benefits of grid modernization investments proposed by Xcel in its next rate case or Transmission Cost Recovery filing and to assist the Department in providing recommendations to the Commission regarding any such investments.⁵

Through this engagement and in service of the Commission's request, Synapse developed a document, attached to the Department's Letter, titled *Review and Assessment of Grid Modernization Plans: Guidance for Regulators, Utilities, and Other Stakeholders* (Guidance Document). The Guidance Document was developed to support the analysis of grid modernization investments in Minnesota.

The Commission's TCR Rider Notice contains two separate comment periods, one for the *AGIS Related Scoping & Procedures*, and the other for the *Transmission Cost Recovery (TCR) Petition*. After comment period extensions, initial comments for the *AGIS Related Scoping & Procedures* comment period were submitted on March 30, 2022 by the following parties: (1) the Citizens Utility Board of Minnesota (CUB); (2) the Department; and (3) Xcel.

The Department recommended that the Commission bifurcate Xcel's 2021-2022 TCR Rider petition into the AGIS-related costs and non-AGIS costs and refer the AGIS-related costs of Xcel's 2021-2022 TCR Rider Petition to the Office of Administrative Hearings (OAH) for a contested case proceeding pursuant to Minn. R. 7829.1000. CUB also recommended that the Commission bifurcate the costs of Xcel's 2021-2022 TCR Rider petition and refer the AGIS-related costs to the OAH, citing the complexity and significance of Xcel's AGIS investments. Xcel recommended that the Commission rely on the

⁴ Department's Letter. Docket No. E002/M-21-814. February 9, 2022. Accessed at: <https://efiling.web.commerce.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={D09BE07E-0000-C153-AEF1-6251101796D1}&documentTitle=20222-182633-03>.

⁵ *In the Matter of the Petition of Northern States Power Company for Approval of the Transmission Cost Recovery Rider Revenue Requirements for 2017 and 2018, and Revised Adjustment Factor*, Docket No. E002/M-17-797, ORDER AUTHORIZING RIDER RECOVERY, SETTING RETURN ON EQUITY, AND SETTING FILING REQUIREMENTS (September 27, 2019) (2017-2018 TCR Rider Order). Order Point No. 10. Accessed at: <https://efiling.web.commerce.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={90C2736D-0000-C01D-9089-5F9E7FB89DA6}&documentTitle=20199-156134-01>.

miscellaneous filing procedures to evaluate the merits of Xcel's 2021-2022 TCR Rider Petition, arguing that a bifurcation is not warranted.

Separately, on March 24, 2022, the Department requested that the Commission suspend the Transmission Cost Recovery (TCR) Comment periods of April 5 and 15 until after the Commission receives comments and reply comments in response to the AGIS Related Scoping & Procedures comment period and determines the procedural path for the review of the AGIS-related costs of Xcel's 2021-2022 TCR Rider Petition. On April 4, 2022, the Commission suspended the Transmission Cost Recovery (TCR) Comment periods.

On April 8, 2022, the Department requested an extension of the AGIS Related Scoping & Procedures reply comment period of April 11 to May 2. The Department's extension request letter explained that preliminary discussions between the Department and Xcel were ongoing regarding an alternative approach to the procedural review of Xcel's 2021-2022 TCR Rider Petition, and that further time was needed to determine whether the Department and Xcel could come to an agreement.

In the intervening time, both the Department and Xcel engaged in good-faith and constructive dialogue regarding the procedural review of the Xcel's 2021-2022 TCR Rider Petition. The Department and Xcel have agreed to an alternative approach relying on the Commission's comment and reply comment process in conjunction with ongoing dialogue regarding the Department's Letter, technical workshops for stakeholders, and a supplemental filing that is intended to provide additional information necessary to understand and evaluate the Company's investments.

It is the Department's hope and expectation that the agreement reached with Xcel provides a clear pathway for stakeholder involvement in the proceeding, balances the informational asymmetry between Xcel and stakeholders, and facilitates an evaluation of Xcel's 2021-2022 TCR Rider Petition that will result in ratepayer protections and the Company being held accountable to the estimated costs and benefits of the Company's investments.

Separately, Department Attachment 1 provides the Company's responses to Department and Synapse information requests.

II. DEPARTMENT RECOMMENDATION

The Department provides the text of the agreement reached between Xcel and the Department below. The Department's recommendation supersedes the recommendations contained in the Department's March 30, 2022 comments.

The Department recommends that the Commission adopt the following agreement and establish the proposed procedural review process detailed therein.

Northern States Power Company, doing business as Xcel Energy, submits to the Minnesota Public Utilities Commission this letter informing the Commission that the Minnesota Department of Commerce and Xcel Energy have agreed on a recommended procedural path for review of the Company's grid modernization costs included in our 2021 Transmission Cost Recovery Rider Petition.

The Department and the Company are in agreement that consideration of the merits of all components of the Company's TCR Petition should continue in the present docket using the Commission's existing, robust miscellaneous filing procedures, subject to the following:

- Xcel Energy will supplement the record with additional information that comprehensively summarizes the Company's AMI and FAN plans and correlates the Company's filed information to the Synapse Completeness Review reflective of the recommended initial filing requirements from the Guidance Document attached to the Department's March 30, 2022 Comments in this proceeding.
 - Xcel Energy and the Department agree to continue to work collaboratively toward a mutual understanding of the Synapse Completeness Review that stemmed from the Department's Guidance Document, including its recommended initial filing requirements.
 - Xcel Energy will make its best effort to meet the spirit of the Completeness Review, to the extent practicable. In doing so, Xcel Energy is not accepting the Department's Guidance Document as explained in its prior comments in this proceeding.
- Xcel Energy's position regarding the Department's Guidance Document notwithstanding, the Company is committed to providing all information the Synapse Completeness Review indicates is required in order to evaluate Xcel's grid modernization costs, to the extent practicable. To the extent that information cannot be provided, the Company will explain why.
- The Department withholds a determination of merit on the Company's proposal until it has reviewed the supplemental filing in the context of the full record.
- Xcel Energy will hold public technical workshops regarding its AMI and FAN projects similar to the workshops it proposed in its August 28, 2020 Procedural Paths Compliance Filing in Docket No. E002/M-20-680.⁶ Those topics are generally:
 - AMI and FAN Technologies
 - Advanced Grid Customer Strategy and Roadmap

⁶ See Xcel Energy Compliance Filing at pages 3-7 at:

<https://efiling.web.commerce.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId=%7bD0F33674-0000-CA1C-BF4E-78D8FD2371B2%7d&documentTitle=20208-166259-01>

- AMI and FAN Financials, Cost-Benefit Analysis, and Estimated Customer Cost Impacts, and Proposed Reporting
- Xcel Energy will additionally clarify or supplement the record for its Advanced Distribution Management System (ADMS) with information about how the ADMS implementation is going, how the Company is using ADMS, the benefits or efficiencies being realized, and the synergies ADMS has with other current or planned grid modernization investments, particularly AMI and FAN. To the extent any benefits cannot be practicably quantified, the Company will explain why.
- If Xcel Energy and the Department cannot come to a mutual understanding or agreement regarding the quality and type of information the Company provides in the supplemental filing, Xcel Energy will include the information it believes meets the Commission's requirements in its Supplement and explain its reasoning. The Department will consider that information in its evaluation of the merits of the Company's TCR Petition and respond accordingly in its Comments.

Proposed Procedural Timeline

- **Commission determination on procedural path** – the Department and Xcel Energy request a determination as soon as practicable.
- **Xcel Energy Supplement** – submitted within 90 days after a Commission determination on the procedural path.
- **Xcel Energy Technical Workshops** – complete within 30 days after its Supplement is submitted.
- **Party Comments on the merits of the Company's TCR Petition (in its entirety)** – 60 days after the Company's Supplement is filed.
- **Xcel Energy Reply Comments** – 30 days.

2020 and 2021 AMI and FAN Revenue Requirements

To the extent the entirety of the Company's TCR Petition will not be considered by the Commission before December 31, 2022, as previously included in both the Department's and the Company's Comments in this proceeding, we jointly request the Commission to affirmatively approve the Company's recovery of its 2020 and 2021 AMI and FAN revenue requirements by the end of December 2022, subject to true-up in conjunction with the Commission's overall determination of revenue requirements on the Company's 2021 TCR Petition.

The Department and Synapse are available for any questions that the Commission may have.

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Xcel Energy Information Request No. 1
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Status of Certified Projects

Reference(s): Xcel Energy 2019 Integrated Distribution Plan, Xcel Energy September 25th 2020

Response to Department Notice Stakeholder Process Information Report

Request:

1. Based on the September 25th, 2020 Response to Department Notice Stakeholder Process Information Report and XCEL Energy 2019 Integrated Distribution Plan” Xcel Energy outlined an update to their plans around Field Area Network (“FAN”). In reference to this response, please respond to the following:
 - a. Please outline the scope and functionality changes made to FAN since the release of the 2019 Integrated Distribution Plan
 - b. Please provide a breakout of costs for FAN as originally planned in accordance with the 2019 Integrated Distribution Plan (IDP).
 - c. Please provide a planned breakout of investments for FAN based on the update submitted on September 25th, 2020 as referenced.
 - d. Please provide a breakout of investments that have been made in FAN to date. Please identify which of these investments was related specifically to WiMax.
 - e. Please indicate whether each of the investments that has been incurred to date in subpart d. is compatible with the interim solution in public cellular technology as outlined on September 25, 2020 on Page 2. If not, please explain why.
 - f. Please indicate whether each of the investments that has been incurred to date in subpart d. is compatible with the future LTE implementation as outlined on September 25, 2020 on Page 2. If not, please explain why.
 - g. Please indicate which of the investments that has been incurred to date in subpart d. is related to replacement of WiMax supported technology with public cellular technology.

Response:

- a. The scope and function of the FAN have not changed since our 2019 IDP filing. The FAN continues to have two primary components that gather and provide data to the Company's backbone Layer-3 networks (routers, switches, and circuits) that deliver data to and from the Company's systems: (1) *WiSUN* based wireless mesh communications between field access points and devices, and (2) *backhaul*, which is comprised of varying wireless and wireline communications technologies (LTE wireless, cellular wireless, copper and/or fiber), which facilitates communications between field access points and the backbone. Our WiSUN plans remain exactly the same as described in our 2019 IDP. Although our original plan for the backbone component initially involved WiMAX technology, we always contemplated eventually transitioning to other private, public, or other means to deliver the data. As we explained in the 2019 IDP, we specifically anticipated a migration from WiMAX to LTE over time as technology advanced. The change to FCC rules related to the frequency spectrum utilized by WiMAX caused us to change the mix of our backhaul methods more abruptly than we expected, and necessitated that we increase our reliance on the public LTE method at least in the near-term. We are continuing to review the potential use of both fiber (OPGW and Dark Fiber) as well as private LTE for a portion of our AGIS FAN needs beyond 2022.

More broadly, as with any technology, we need to be flexible and adapt in order to continue to meet system needs and expected functionalities.

- b. The FAN costs we presented in our 2019 IDP include both WiSUN and backhaul amounts. We provide a summary and breakout of these components in Tables 1 and 2 below.

Table 1: Field Area Network Capital Expenditures Budget – NSPM Electric (Millions)

	MYRP Case Period			5-Year Period	10-Year Period
Component	2020	2021	2022	2023-2024	2025-2029 ¹
FAN Total²	\$14.7	\$37.3	\$36.8	\$3.8	-
WiSUN	\$3.2	\$6.2	\$0.0	\$0.0	-
Backhaul	\$11.5	\$31.1	\$36.8	\$3.8	-

¹ Period may include additional assumptions, including inflation and labor cost increases that are not part of the capital budget in periods 2020-2024.

² Includes the TOU Pilot.

Table 2: Field Area Network O&M Expenditures Budget – NSPM Electric (Millions)

Component	MYRP Case Period			5-Year Period	10-Year Period
	2020	2021	2022	2023-2024	2025-2029 ³
FAN Total⁴	\$0.1	\$2.3	\$1.5	\$0.5	\$8.6
WiSUN	\$0.1	\$0.2	\$0.4	\$0.3	\$0.4
Backhaul	\$0.0	\$2.1	\$1.1	\$0.2	\$8.2

- c. We outline our updated expected costs of the FAN plan through 2022 below, which is the period we intend to primarily rely on public LTE for our AGIS backhaul communication needs.

Table 3: Field Area Network Actual and Budgeted Capital Expenditures (pre-2020-2022) NSPM Electric (Millions)

Component	Actual		Budgeted	
	Pre-2020	2020	2021	2022
FAN Total⁵	\$1.7	\$0.5	\$7.3	\$53.8
WiSUN	\$0.0	\$0.0	\$6.9	\$7.2
Backhaul	\$1.7	\$0.5	\$0.4	\$46.6

Table 4: Field Area Network Actual and Budgeted O&M Expenditures (2020-2022) NSPM Electric (Millions)

Component	Actual		Budgeted	
	Pre-2020	2020	2021	2022
FAN Total⁶	\$0.1	\$0.1	\$1.2	\$1.2
WiSUN	\$0.0	\$0.0	\$0.9	\$0.9
Backhaul	\$0.1	\$0.1	\$0.3	\$0.3

We note that the above amounts include approximately \$500,000 to support the technical aspects of our ongoing backhaul analysis and converting those sites to private LTE for that analysis. In addition to these amounts, we incurred

³ Period may include additional assumptions, including inflation and labor cost increases that are not part of the capital budget in periods 2020-2024.

⁴ Includes the TOU Pilot.

⁵ Includes the TOU Pilot.

⁶ Includes the TOU Pilot.

approximately \$1.2 million for three WiMAX sites to support the Time of Use Pilot. We recovered these amounts through base rates.⁷

Once we complete our analysis, we will be in a position to update our 5-year budget amounts, which will include the updated 2022-2026 period. For now, we note that the dollar amounts for 2022 in Tables 3 and 4 are only placeholders.

- d. See our response to part c above.
- e. As noted in our response to part c, we incurred approximately \$500,000 to convert the three WiMAX sites to be able to use public LTE. Otherwise, everything else we are doing currently with respect to the FAN will carry-forward for the long-term and will work with either public or private LTE.
- f. See our response to part e above.
- g. See our response to part e above.

Preparer:	Wendall Reimer
Title:	Director – OT Networks
Department:	Business Systems
Telephone:	651.639.4448
Date:	March 19, 2021

⁷ See DOC-4 in Docket No. E002/M-17-775 (January 19, 2018).

Xcel Energy	Information Request No.	2
Docket No.:	E002/M-20-680	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi; Divita Bhandari	
Date Received:	March 8, 2021	

Response to Department Notice Stakeholder Process Information Report

Request:

2. Based on the September 25th, 2020 Response to Department Notice Stakeholder Process Information Report and XCEL Energy 2019 Integrated Distribution Plan” Xcel Energy outlined an update to their plans around Field Area Network (“FAN”), on Page 2, Xcel Energy indicates the updates “will ensure Xcel Energy meets its commitments to our customers as well as position the Company to potentially convert to private LTE in the future”
- a. Please outline any ongoing plans made by Xcel Energy to pursue LTE implementation.
 - b. Please identify if private LTE implementation has been considered? Please provide details of any evaluation conducted to date in this regard.
 - c. Please identify if hybrid LTE has been considered? Please provide details of any evaluation conducted to date in this regard.
 - d. If planned, please provide the breakout of costs that have been incurred for LTE implementation to date.
 - e. If planned, please provide the planned breakout of costs for LTE implementation going forward.
 - f. If planned, please provide the timeline of implementation of LTE.
 - g. If planned, what functionality will LTE provide beyond what was outlined in the 2019 Integrated Distribution Plan in comparison with the proposed Field Area Network (FAN)? At minimum,
 - h. Please address functionality in the context of the following: AMI border routers/access points (Wi-SUN), DER, IVVO, FLISR and ADMS.

- i. Please address the interoperability of existing system equipment with planned LTE including any required replacements of existing infrastructure.
- j. Please indicate what alternatives to LTE implementation have been reviewed? Provide the results of any analysis conducted to date looking at the alternatives to LTE implementation.

Response:

- a. We are evaluating FAN backhaul communication method alternatives, including private LTE. The current use of cellular utilized the LTE technology over public carriers' equipment and services. We are currently in the evaluation and testing phases – analyzing both technical and cost assumptions associated with a primary private LTE solution or a hybrid approach that includes private LTE to support AMI and other use cases. The primary considerations for private LTE are costs for spectrum, security, resilience of the network, mean-time-to-resolve and operational costs. All of these aspects of the private LTE option are being reviewed along with additional use cases for other business communication needs now, and into the future along with alignment with other Xcel Energy-owned and planned network assets such as fiber and microwave. As part of our analysis, we have built and established two private LTE base stations in the Minneapolis area with required infrastructure to support initial testing and use cases for AMI, other AGIS use cases as well as use cases for other business purposes.
- b. Please see our response to part a above.
- c. Our FAN plans have always contemplated a hybrid solution for backhaul communications needs. A core part of what Xcel Energy considers “Hybrid LTE” is where you place the take-out points for the LTE communication and use other infrastructure to connect to data centers and other locations. In that manner you are utilizing the full capabilities of the network assets available to provide fast, reliable and security communications as well as utilizing the latest technology to support SDN (Software Defined Networks) and monitoring capabilities. That said, hybrid LTE is currently one of the options under consideration and evaluation – including reaching out to potential partners for Hybrid LTE to determine the coverage and reliability in Xcel Energy service territory within Minnesota.
- d. To date, we have spent \$508,810 against a budget of \$550,549 for a limited LTE deployment to support the technical aspect of our evaluation.
- e. As we noted in our response to DOC-1, we have not yet completed our analysis, so we do not have AGIS FAN cost projections for the years 2023 and beyond.

- f. We are committed to near-term use of public LTE through at least 2022, which keeps our AMI deployment on track while we evaluate alternatives for the long-term.
- g. Our FAN plans have always contemplated a mix of communication methods. As for the private LTE we are currently evaluating, it would continue to support AMI Backhaul (Access points), and the addition of field devices associated with advanced applications such as IVVO and FLISR. Beyond that, private LTE could also support the Company's Land Mobile Radio (LMR-LTE) push to talk interoperability, SCADA communications, workforce mobility, substation video and drone communications, and more.
- h. The functionality of private LTE or our current planned cellular LTE are the same with respect to the examples noted in the question. Both solutions provide the same technical capabilities to support those functions, devices, and use cases.
- i. We are currently testing the interoperability of private LTE with existing systems.
- j. So far, we have reviewed commercial cellular and CBRS GAA, and both were determined inadequate for mission critical grid control and mission critical communications. Additional solutions that we are considering include satellite communications, microwave and leased circuits. We note that we are also a participating member in EEI, UTC and UBBA (utility broadband alliance), and have regular meetings and detailed discussions with other energy partners on solutions that are being reviewed across the industry and with related vendors.

Preparer: Wendall Reimer
Title: Director OT Networks
Department: Business Systems
Telephone: 651.639.4448
Date: March 19, 2021

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Xcel Energy Information Request No. 3
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Status of Certified Projects

Reference(s): Xcel Energy 2019 Integrated Distribution Plan, Xcel Energy September 25th 2020 Reply Comments - Response to Department Notice Stakeholder Process Information Report and XCEL Energy 2019 Integrated Distribution Plan”, DOCKET NOS. E999/DI-20-627 AND E002/M-19-666

Request:

1. Based on the September 25th, 2020 Response to Department Notice Stakeholder Process Information Report and XCEL Energy 2019 Integrated Distribution Plan” Xcel Energy outlined an update to their plans around Field Area Network (“FAN”), Xcel Energy indicates that they “replaced all WiMAX supported technology with public cellular data technology to support continued connectivity to the WiSUN mesh network to support the AMI meters that have been deployed to-date. This is a reasonable interim solution because it is a proven technology in use by other utilities with similar needs”
 - a. What are the requirements for Wi-SUN interoperability and compatibility for meters/end nodes? Please also address whether there will be multi-vendor support for meters/end nodes.
 - b. What are the requirements for Wi-SUN interoperability and compatibility for relays/routers? Please also address whether there will be multi-vendor support for relays/routers.
 - c. What are the requirements for Wi-SUN interoperability and compatibility for access points/border routers? Please address whether there will be multi-vendor support for access points/border routers.
 - d. What is the estimated percentage coverage of utility territory for AMI meters using Wi-SUN.
 - e. What is the estimated percentage of utility customers with AMI meters using Wi-SUN?

Response:

- a-c. Please see our Request for Proposal for the FAN, provided as Attachment N3 to our 2019 IDP, for the requirements.
- d. We expect that all of our Minnesota customers will have an AMI meter with WiSUN, when our deployment is complete – so the percentage would be 100 percent.
- e. See our response to part d.

Preparer: Wendall Reimer
Title: Director OT Networks
Department: Business Systems
Telephone: 651.639.4448
Date: March 19, 2021

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Xcel Energy Information Request No. 4
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Status of Certified Projects
Reference(s): Xcel Energy 2019 Integrated Distribution Plan, Xcel Energy September 25th 2020 Response to Department Notice Stakeholder Process Information Report and XCEL Energy 2019 Integrated Distribution Plan”, DOCKET NOS. E999/DI-20-627 AND E002/M-19-666

Request:

1. Based on the September 25th, 2020 Response to Department Notice Stakeholder Process Information Report and XCEL Energy 2019 Integrated Distribution Plan” Xcel Energy outlined an update to their plans around Field Area Network (“FAN”) on Page 2, Xcel Energy indicated replacement of all WiMAX supported technology with public cellular data technology to support continued connectivity to the WiSUN mesh network to support the AMI meters that have been deployed to-date. In reference to the decision to use a public cellular network, please outline the following:
 - a. Please outline any specific pricing metrics that were considered (e.g \$/bandwidth etc) for evaluation of the different alternatives.
 - b. Please describe the pricing model for lease of a public network in the context of each of the metrics outlined in subpart a.
 - c. Please provide pricing options for private LTE ownership in the context of each of the metrics outlined in subpart a.
 - d. Please provide the pricing model for other alternatives considered in the context of each of the metrics outlined in subpart a.
 - e. Please describe how the different alternatives were evaluated in terms of the pricing options that lead to the decision of leasing a public network.

Response:

- a. In terms of capital, we evaluated the per AP connection (i.e. Hardware and installation labor). For operating (run-state) costs, we evaluated the annual costs

to support the AP connection in terms of data rates versus internal support (of an owned solution).

- b. The pricing model is based on directly negotiated contracts for data usage with the cellular providers, such as Verizon, with external benchmarking where appropriate. The overall data rates and devices connected are driven thru the contracts we have with those vendors.
 - c. As we have noted elsewhere, no decision has been made with respect to a major deployment of private LTE and our evaluation of its capabilities and costs is ongoing. Part of that evaluation is the costs, which we consider non-negotiated and preliminary. The cost categories and considerations are similar to WiMAX and include the following:
 - *Equipment.* Pricing is per-device, like it was for WiMAX. We expect these costs to be relatively similar to WiMAX on a per device and installation basis, so do not anticipate any significant changes to the overall network equipment category of costs.
 - *Network Design.* Because the spectrum we are considering (900MHz) can cover a larger area than the shared frequency that was being considered for WiMAX, we believe we will need for fewer towers/base stations that would have been required for WiMAX.
 - *Ongoing Costs.* We expect run-state support costs for Private LTE would be similar to what we had estimated for WiMax.
 - d. Costs associated with other alternatives are currently being developed as part of our ongoing analysis.
 - e. Our evaluation is ongoing. Some of our considerations to-date are as follows:
 - *Continuing with WiMAX, and the CBRs spectrum and implementing Spectrum as a Service (SAAS).* Pricing involved very high cost estimates for O&M to support the SAS and internal support.
 - *Purchasing spectrum in the CBRs spectrum thru auctions.* Pricing involved very high costs for spectrum purchase and no assurance we could achieve desired spectrum in all desired operating counties.
 - *Private LTE utilizing 900MHz spectrum.* Currently the primary option being detailed out in the limited deployment.
 - *Public cellular.* Currently best solution to ensure we meet critical deployment milestones and includes a higher than expected longer-term O&M costs for data rates.
 - *Private LTE utilizing other spectrum options.* Options were not far enough along in terms of maturing or viability at this time.
-

Preparer: Wendall Reimer
Title: Director OT Networks
Department: Business Systems
Telephone: 651.639.4448
Date: March 19, 2021

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Xcel Energy Information Request No. 5
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Status of Certified Projects
Reference(s): Xcel Energy 2019 Integrated Distribution Plan, Department of Commerce Stakeholder Workshop, Xcel Energy's AMI and FAN presented October 23rd 2020.

Request:

1. Based on the stakeholder workshop presentation on October 23rd 2020 in reference to AMI meters on Slide 8, Xcel Energy indicate the use of Itron's Gen 5 RIVA meter with Distributed Intelligence platform. In reference, please provide the following:
 - a. If different from the above mentioned Itron meters, please identify the model of AMI meters proposed in the 2019 IDP.
 - b. If different, please provide any revisions to the capability and functionality of the meters to be deployed compared to those proposed in the 2019 IDP.
 - c. If different, please provide any revisions to the costs of the meters to be deployed compared to those proposed in the 2019 IDP.
 - d. Please provide information regarding any jurisdictions where AMI-DI are currently being used including any analysis on benefits and costs from any pilot projects in other jurisdictions.
 - e. Please outline the additional benefits that have been realized through the use of AMI-DI that are not realized through traditional AMI meters.
 - f. Please provide details on how the AMI-DI platform will translate to measurable benefits.

Response:

- a. The meters proposed in the 2019 Integrated Distribution Plan¹ are the Itron RIVA 4.2 meters and the same as represented in the October 23, 2020 presentation.

¹ See Docket No. E002/M-19-666, INTEGRATED DISTRIBUTION PLAN, Attachment M2 – Direct Testimony of Company witness Ms. Kelly Bloch, P. 40, November 1, 2019.

- b. Please see part a above.
- c. Please see part a above
- d. Please see Attachment A to this response for a public presentation we received from Itron that outlines what Tampa Electric is doing with their DI capabilities. It is our understanding that additional utilities are either using the DI capabilities or intending to use them; however, Itron is not at liberty to release the details about them.
- e. The primary benefits that may be realized through AMI-DI that are additional to traditional AMI meters involve use cases requiring real-time communications, as well as those requiring more granular energy usage data than typical AMI reading intervals. Categories for benefits include the following:
 - a. *Energy Insights and Audits*: providing customers more accurate, personalized, and timely information to help inform energy consumption decisions. Benefits primarily arise in the form of energy efficiency and peak demand savings, which can be measured directly via comparison of energy consumption patterns of participants vs. non-participants.
 - b. *Smart Controls*: Ability to optimize facility and equipment operation based on the real-time conditions of the grid. Benefits primarily arise in the form of peak demand savings, which can also be measured directly via comparison of energy consumption patterns of participants vs. non-participants.
 - c. *Safety and Protection*: the ability to monitor and provide timely communication around potential safety issues. Benefits primarily arise in the form of societal cost savings, which can be measured indirectly via utilization of these capabilities.
 - d. *Smart Transactions*: Benefits in the form of customer bill savings, cost to serve, reduction of bad debt, and more efficient control of load.
 - e. *Reliability*: Benefits in the form of reduced outages and outage durations.
 - f. *Grid optimization*: Benefits in the form of reduced spending on distribution management systems, lowering cost to serve.
- f. Please see part e above.

Preparer: Paul Davis
Title: Director – Meter Reading
Department: AGIS & Metering
Telephone: 715.737.5603
Date: March 19, 2021



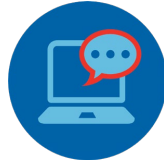
INTELLIGENCE THAT EMPOWERS: Quantifying the Value & Benefits of Distributed Intelligence

DAVID M. LUKCIC, TECO

@ dmlukcic@tecoenergy.com



TRACY TINSLEY
*AMI Project Director,
Duke Energy*



CONTENT

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Speaker Bio



DAVID LUKCIC

*Director of AMI Strategic Solutions,
Tampa Electric Company*

- » 22 years at TECO
- » 24 years in the utility industry
- » Electrical Engineering, University of South Florida
- » Just finished reconstructive shoulder surgery due to an indoor surfing incident

- » Distributing analysis, decision-making and action to the edge...
moving the solution closer to the problem
- » Ability to provide highly intelligent computational devices at the
edge of a utility's distribution system
- » Using intelligent connectivity to enable meters, IoT devices, and
non-intelligent devices via the IoT Edge Router

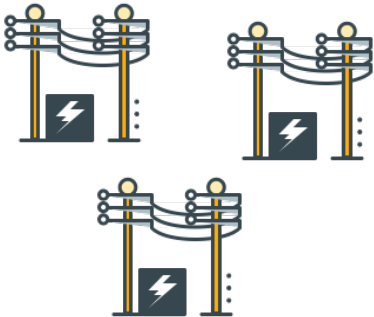
2,000-square-mile
service area



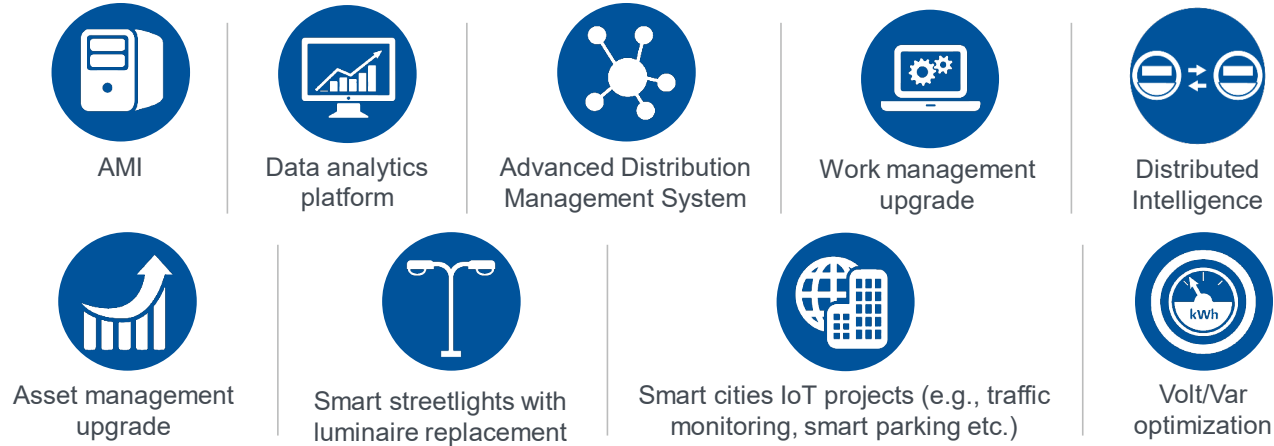
More than 750,000
customers







Three electric generating
stations - 4,668 MW



TECO is making a transformational investment in new customer experience and operational programs. Supporting projects underway:



 AMI Solution	 Supporting Solutions	 Solutions that Leverage AMI Data	 Smart Cities Solutions
<ul style="list-style-type: none">• Meter deployment• AMI headend system• Network deployment• Network headend system (IPv6 SNI + FND)• DI Platform	<ul style="list-style-type: none">• IEE MDM• Data warehouse• SAP CRB (existing)	<ul style="list-style-type: none">• Asset management system (TESCO)• Web portal• Volt/var optimization• Capacitor banks	<ul style="list-style-type: none">• Streetlight head end system• Smart cities IoT (traffic monitoring, smart parking, gunshot location, etc.)• Smart cities initiatives

- » Industry leader
- » Long track record of reliable performance
- » Expandable platform
- » Future-proof
- » True partnership

- » Long-standing relationship
- » Striving for an open network
- » Significant memory in the meters at a competitive price point
- » GenX had a growing ecosystem of products anchored by Smart LEDs
- » DI applications and paths for owner app development

- » Provides power and control to edge devices
- » Resolves issues quicker
- » Manages transactions and power flows in real-time
- » Predicts and manages energy needs across entire network
- » Delivers consumer-based insights for to improve safety and address usage
- » Empowers an open and vibrant ecosystem of solution providers

- » Explore innovation in industry
- » Determine which option:
 - Delivers maximum value while considering costs
 - Finds conditions and opportunities in the field more effectively
 - Uncovers feasibility of deploying apps
- » Validate decision to implement DI applications
- » Provide a basis for other utilities to cite success and justify projects
- » Risk/reward
 - Investment in newer technology with greater upside potential

- » DI Apps perform their analysis of data at the edge of the grid (on the meter) and then transmit events based on what has been computed and derived at the meter
- » Cloud Analytics follows traditional back-office analytics taking the data files of what is transmitted over the air by the meters and performing analysis in the cloud to derive results
 - Machine learning is part of this and requires algorithms to be trained on identifying conditions

- » By moving analytics to the meter with access to one-second data and peer-to-peer communications, utilities will realize the following benefits:
- ~Two times the accuracy of finding conditions – resulting in higher yield, less inference and wasted resources.
 - Faster decisions based on more valuable information – assuming the value of data degrades with latency.
 - Significant drop in Total Cost of Ownership (TCO) to acquire actionable information – less backhauled, stored, and analyzed data in the back-office.

- » Itron's Lab in Raleigh was utilized for the first phase of analysis to evaluate the benefits of DI Apps and Cloud Analytics
- » There were three DI Apps deployed to Itron's lab meters:
 - Meter Bypass Theft Detection
 - Residential Neutral Fault Detection
 - High Impedance Detection
- » The Data Collection Period for the study was one month
- » The Cloud Analytics Tool was through Grid4C

High-Level Results of the Study

ITEM	DI APPS	CLOUD ANALYTICS
Meter Bypass-Theft	Identified all (10) use cases created on lab meters	Identified all 10 use cases created on lab meters. Produced 7 false positives
Note: As the cloud analytics machine-learning algorithms have not yet been trained. The algorithm with one month of data produced 7 false positives which should be lower with field trials once the algorithms are tuned. A moderate (30-40%) false positive rate is typical for cloud theft algorithms		
Broken Neutral	Identified all (6) use cases created on lab meters	Identified Zero Use Cases. Attributes required to identify broken neutrals are not present in the data available at the back office/cloud
Note: There is no voltage to ground on a 2S meter, only line-to-line voltage. 2S is the most common meter form in North America. The required data frequency to discriminate and compute broken neutral conditions from available meter measurements cannot be transmitted to the cloud. The cloud vendor tried to produce results based on the search criteria provided but without the voltage to ground information the results were incorrect. This use case will not be tracked from the cloud when moved to field trials.		
High Impedance	Identified all (5) use cases created on lab meters	Identified Zero Use Cases. Attributes required to identify high impedance are not present in the data available at the back office/cloud.
Note: When values are averaged over 5 or 15 minutes, the signature that identifies the use case is lost and therefore the analytics tool cannot identify the occurrence. This use case will not be tracked from the cloud when moved to field trials.		

PHASE I: LAB RESULTS

- » Predictions are correct.
- » Access to real-time data gives actionable information
- » Ability to tackle problems from an entirely different perspective
- » Discover events using DI that are otherwise undetectable by back-office analytics
- » Not all use cases are a fit for DI, but when they are applicable, the value far exceeds back-office results.
- » Safety and customer impact issues would've gone undetected and there would've been costs associated with investigating false positives

PHASE II: FIELD TESTING

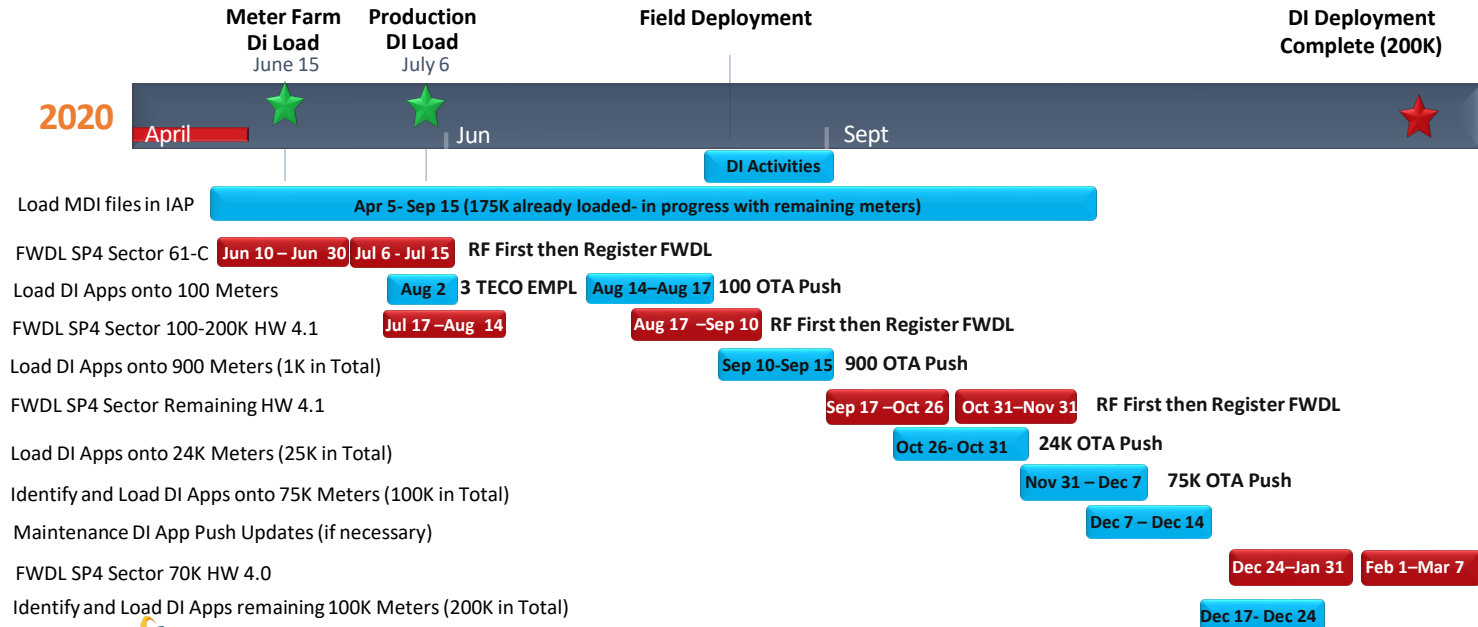
- » Field trial is in progress with deployment of Apps to the meter farm 3 house holds then 100 houses waiting for 200k household deployments in Sept/Oct
- » Preparation of the business case / value proposition is in progress to be utilized in the evaluation of the field trial

Early Field Trial Observations



Application	Total Active Alarms	Itron Investigation - Not Started	Itron Validation - In Progress	TECO Investigation – Not Started	TECO – Investigation – In Progress	Comments
Impedance Core	0	0	0	0	0	This is based on the 99 meters, the additional 864 are in progress
High Impedance Detection	1	0	1	0	0	Same as above
Residential Neutral Fault Detection	0	0	0	0	0	Same as above
Theft Detection	4	0	4	0	0	Same as above

DI Field Rollout Plan (Current Plan)





Thank You

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Xcel Energy Information Request No. 6
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Status of Certified Projects
Reference(s): Xcel Energy 2019 Integrated Distribution Plan, Department of Commerce Stakeholder Workshop, Xcel Energy's AMI and FAN presented October 23rd 2020.

Request:

1. Based on the stakeholder workshop presentation on October 23rd 2020 in reference to AMI meters on Slide 8, Xcel Energy indicate the use of Itron's Gen 5 RIVA meter with Distributed Intelligence platform. In reference, please provide the following:
 - a. Please provide the contract that has been signed with Itron and Xcel Energy in relation to AMI-DI.
 - b. In relation to the contract with Itron relating to AMI-DI, please describe the terms and conditions related to third party access to the data.
 - c. In relation to AMI-DI, please outline the customer access related policies including the extent of availability of utility data to customers.

Response:

- a. The not public Distributed Intelligence (DI) Platform Agreement between Xcel Energy and Itron, dated September 1, 2019 and the related not public Amended & Restated Agreement with Itron, dated September 1, 2019, for the scope of meter supply, installation, network, head-end system, and project management services is were both provided in response to DOC IRs 1-4 in Docket No. E999/DI-20-627.
- b. The DI Platform Agreement does not specify terms and conditions for third-party access to the data. However, please see the following sections and terms regarding data ownership, access, and other third-party provisions.
 - See Section 13 of the DI Platform Agreement.
 - The DI Platform Agreement includes terms for Third Party DI Apps.

- See Section 3.9 of the DI Platform Agreement.
 - See Section 9.7 of the DI Platform Agreement.
- c. Our customer data access policies will not change. All customers will continue to have access to their own information. In terms of the extent of data availability, with implementation of AMI, customers will gain access to more granular, interval-level usage data through an online portal, and Green Button Connect My Data. Customers will also have access to the Home Area Network (HAN) capabilities of the AMI meters, which will provide them with near real-time energy consumption information.
-

Preparer: Mark Raak
Title: Manager, Commercial Services
Department: Supply Chain
Telephone: 612-735-4753
Date: March 19, 2021

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Xcel Energy	Information Request No.	7
Docket No.:	E002/M-20-680	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi; Divita Bhandari	
Date Received:	March 8, 2021	

Question:

Topic: Status of Certified Projects

Reference(s): Xcel Energy 2019 Integrated Distribution Plan, Xcel Energy September 25th 2020 Response to Department Notice Stakeholder Process Information Report and XCEL Energy 2019 Integrated Distribution Plan”, DOCKET NOS. E999/DI-20-627 AND E002/M-19-666

Request:

1. Xcel Energy states that the FCC decision “has limited the effectiveness of WiMAX technology and driven U.S. vendors to abandon support of the product – forcing Xcel Energy to look for alternatives.” (pages 1-2 of 9-25-2020 comments). Describe how Xcel Energy is managing the FCC decision in other service areas employing WiMAX technology for AMI, such as in Colorado, if applicable.
2. Xcel Energy states that the FCC decision “has limited the effectiveness of WiMAX technology and driven U.S. vendors to abandon support of the product – forcing Xcel Energy to look for alternatives.” (pages 1-2 of 9-25-2020 comments). Please describe any research in relation to other jurisdictions facing similar issues and any alternatives deployed by such jurisdictions.

Response:

1. Public cellular has been deployed to replace the WiMAX connectivity at AP’s (Access Points). The primary infrastructure deployed to support WiMAX is still being used for other communication requirements and plans including towers, fiber/cabling, power, etc. There are no other installed uses of WiMAX at Xcel than those described in the context of AGIS.
2. The solutions being planned for deployment in Minnesota are consistent with the plans for deployment in other jurisdictions including cellular, private LTE and use of existing Xcel assets such as fiber.

With regard to discussions in the broader industry, Xcel participates with several industry/utility organizations that are faced with very similar challenges around the use of WiMAX and cellular versus private LTE solutions. Xcel's approach is consistent with the approaches and plans other utilities similar to Xcel Energy are proposing and/or moving forward with. These include:

- Partnering with other utilities as a member of the UTC (Utility Technology Council) involved in working with utilities and lobbying the FCC on critical issues surrounding use of frequencies and related technology.
- Partnering with other utilities as a member of UBBA (Utility BroadBand Alliance) involved in sharing knowledge and plans around resolving issues related to wireless communications for utilities.
- Engaged with EEI (Edison Electric Institute) on research they are doing regarding wireless communications.
- Member of EPRI (Edison Electric Institute) reviewing approaches and plans with other utilities around broadband use.

Xcel is also continuing its research with principal cellular providers such as AT&T and Verizon to understand their offerings and roadmaps in the area of communications and backhaul capabilities for this type of communication.

Preparer: Wendall Reimer
Title: Director OT Networks
Department: Business Systems
Telephone: 651.639.4448
Date: March 19, 2021

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Xcel Energy	Information Request No.	8
Docket No.:	E002/M-20-680	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi; Divita Bhandari	
Date Received:	March 8, 2021	

Question:

Topic: Benefit Cost Analysis

Reference(s): Xcel Energy 2019 Integrated Distribution Plan

Request:

1. In regard to the 2019 IDP:

- a. Please provide the underlying data for attachments O1, O2, O3, and O4 in Microsoft Excel format, with all formulas intact and visible for review, and no hidden or protected cells.
- b. Separately, please provide updated versions of the same attachments – O1, O2, O3, and O4 to the 2019 IDP – that reflect any changes to costs or benefit figures that have been made since the 2019 IDP was filed. In a separate document to be provided alongside the updated attachments, note all updates that have been made with clear references to the modified cells, and indicate the reason for each change including citations to relevant filings or other supportive documentation.

Response:

- a. Please see the Trade Secret workpapers we submitted with our initial IDP filing in Docket No. E002/M-19-666 on November 1, 2019.
 - b. As we have explained, our evaluation of a long-term FAN backhaul plan is ongoing. A thoughtful update to the cost-benefit analysis is resource intense. Updating the cost-benefit analysis at this time would not accurately reflect the Company's long-term plans and therefore would misrepresent the costs and benefits. For these reasons, and as explained in a discussion with Department of Commerce staff regarding this set of Information Requests, we are not planning to update the cost-benefit analysis until after we have made our determinations regarding the long-term FAN plan.
-

Preparer: Nick Paidosh
Title: Principal Analyst
Department: Regulatory Affairs
Telephone: 612-342-9034
Date: March 19, 2021

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Xcel Energy Information Request No. 9
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Benefit Cost Analysis
Reference(s): Xcel Energy 2019 Integrated Distribution Plan, Direct Testimony and Schedules Michael C. Gersack

Request:

In reference to the benefits reported for each of the components of the AGIS in the 2019 IDP (Direct Testimony and Schedules Michael C. Gersack, pages 161-162), for each component (AMI, FLISR, IVVO), separately indicate the share of benefits that would arise if the given component were to be implemented in isolation and the share that arises due to the interaction of this component with the other components in the AGIS. (Provide estimated benefit values in millions of dollars.) To the extent that a portion of the reported benefits for a given component would not materialize but for the interaction of the given component with other components of the AGIS, specify each interdependency and the value of benefits arising due to the interaction between components, and explain why the other component is necessary in order for the benefit to materialize

Response:

The benefits portrayed for AMI are not dependent upon the implementation of FLISR and IVVO. On the other hand, the benefits for FLISR and IVVO are heavily dependent upon the initial deployment of the AMI meters and the accompanying broad FAN deployment. The FAN overall, and the WiSUN/mesh communication aspects of the meters provide important data capabilities needed for advanced applications such as IVVO and FLISR to perform optimally; additionally, data from the meters is needed for IVVO. Therefore, in the 2019 IDP and initial certification request, we noted our intention to deploy IVVO and FLISR after reaching a necessary critical mass of active AMI meters.

Preparer: Nick Paidosh
Title: Principal Analyst
Department: Regulatory Affairs
Telephone: 612-342-9034
Date: March 19, 2021

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Xcel Energy Information Request No. 10
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Benefit Cost Analysis

Reference(s): Xcel Energy 2019 Integrated Distribution Plan

Request:

In reference to the inclusion of FAN costs in the reported cost totals for the other AGIS components in the 2019 IDP (Direct Testimony and Schedules Michael C. Gersack, pages 150-151), indicate how much of the total expected costs for FAN were allocated to each of the other components, and the basis for each allocation.

Response:

In the 2019 IDP, we assigned 80 percent of the FAN costs to AMI, 15 percent to FLISR, and five percent to IVVO. This allocation was based on estimates of the WiMax bandwidth each component would use. However, since the Commission did not certify IVVO and FLISR for implementation at this time, 100 percent of the AGIS FAN costs will be attributable and thus allocated to AMI.

Preparer: Nick Paidosh
Title: Principal Analyst
Department: Regulatory Affairs
Telephone: 612-342-9034
Date: March 19, 2021

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Xcel Energy Information Request No. 11
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Benefit Cost Analysis

Reference(s): Xcel Energy 2019 Integrated Distribution Plan

Request:

Aside from the uncertainty about the value of the benefits associated with CVR, has the Company quantified the uncertainty associated with any of the other benefits streams that are monetized in the benefit cost analysis for the AGIS provided with the 2019 IDP? Has this uncertainty quantification been reflected in the total benefit estimation? Please provide a detailed response addressing which elements of uncertainty were quantified, how uncertainty was quantified, and how this quantification of uncertainty has impacted the final estimate of AGIS benefits.

Response:

The Company did not quantify or make a specific adjustment for uncertainty associated with any of the benefits. The benefits are based on both values identified by Company subject-matter-experts and the actual experiences of other utilities that previously implemented AMI. Through this process, as we identified benefit ranges, we used the lowest benefit level in an effort to be conservative. As such, the benefits reflected in the cost benefit analysis are a conservative expected outcome that is at least partially based on the actual experience of other utilities.

Preparer:	Pablo Martinez	Steve Rohlwing
Title:	Sr Prin Risk Analyst	Manager Asset Risk
Department:	Risk Strategy	Risk Strategy
Telephone:	303-571-7639	303-571-7392
Date:	March 19, 2021	

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Xcel Energy Information Request No. 12
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Benefit Cost Analysis

Reference(s): Xcel Energy 2019 Integrated Distribution Plan

Request:

Does the contingency that is included with the cost estimates in the benefit cost analysis for the AGIS provided with the 2019 IDP include the risk of early obsolescence – that is, the risk that AGIS components will have to be replaced prior to the expected date?

Response:

The contingency amounts included in the cost benefit analysis and budgets do not include considerations for early obsolescence. Please refer to pages 154-160 of the Direct Testimony of Company witness Mr. Michael C. Gersack – provided as Attachment M1 to the Company's November 1, 2019 Integrated Distribution Plan (Docket No. E002/M-19-666) for a comprehensive description of our contingency practices. If the Company anticipated a risk of early obsolescence, this would be reflected in an adjustment to the assets' useful life or salvage amounts rather than project contingency. Please see our response to DOC IR No. 15 for information regarding the AMI meter life.

Preparer: Nick Paidosh
Title: Principal Analyst
Department: Regulatory Affairs
Telephone: 612-342-9034
Date: March 19, 2021

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Xcel Energy Information Request No. 13
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Benefit Cost Analysis

Reference(s): Xcel Energy 2019 Integrated Distribution Plan

Request:

For each of the qualitative benefits that have been reported in the benefit cost analysis for the AGIS provided with the 2019 IDP (power quality, safety, etc.), please justify the decision to report this benefit on a qualitative basis – i.e., explain how the Company determined that this benefit is not monetizable.

Response:

The Company looked to leading guidance in developing its cost benefit analysis, and also relied on actual savings other utilities experienced as part of their AMI implementations. In estimating the benefits, we relied on quantification methods with existing Commission guidance or precedence, or those with widespread industry use. For example, the Company utilized Commission Orders to calculate values associated with the avoidance of peak transmission, distribution, and generation investments as well as the societal costs of carbon dioxide emissions. As another example, the Company utilized the widely accepted Lawrence Berkley National Lab ICE methodology to calculate the outage savings associated with FLISR.

Preparer: Nick Paidosh
Title: Principal Analyst
Department: Regulatory Affairs
Telephone: 612-342-9034
Date: March 19, 2021

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Xcel Energy Information Request No. 14
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Benefit Cost Analysis

Reference(s): Xcel Energy 2019 Integrated Distribution Plan

Request:

Beyond the guidance provided by DOE, please indicate any other best practice guidance that the Company referenced in formulating its benefit cost analysis for the AGIS provided with the 2019 IDP.

Response:

In addition to the “Advanced Grid Research” guide provided by the Office of Electricity of the Department of Energy (DOE), the Company consulted the “Estimating the Costs and Benefits of Smart Grid” guide provided by the Electric Power Research Institute (EPRI), and the “Costs and Benefits of Smart Meters for Residential Customers” guide provided by the Institute for Electric Efficiency (IEE), which is part of the Edison Foundation. We provide links to these below:

- [Methodological Approach for Estimating the Benefits and Costs of Smart Grid Demonstration Projects \(epri.com\)](https://www.epri.com/~/media/Files/Smart%20Grid/Methodological%20Approach%20for%20Estimating%20the%20Benefits%20and%20Costs%20of%20Smart%20Grid%20Demonstration%20Projects.pdf)
- [IEE BenefitsofSmartMeters Final.ashx \(edisonfoundation.net\)](https://www.edisonfoundation.net/~/media/Files/Smart%20Meters/IEE%20BenefitsofSmartMeters%20Final.ashx)
- https://www.smartgrid.gov/files/documents/AMI_Report_7_8_20_final_compressed.pdf

Preparer: Pablo Martinez
Title: Sr Risk Management Analyst
Department: Risk Management
Telephone: 303-571-7639
Date: March 19, 2021

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Xcel Energy Information Request No. 15
Docket No.: E002/M-20-680
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi; Divita Bhandari
Date Received: March 8, 2021

Question:

Topic: Benefit Cost Analysis

Reference(s): Xcel Energy 2019 Integrated Distribution Plan

Request:

In reference to the depreciation schedule for IVVO and FLISR in the 2019 IDP (Direct Testimony and Schedules Michael C. Gersack, page 163), does the Company expect that these components will be used and useful for 20 years? If so, please explain why their lifespan is longer than the lifespan of the AMI investment

Response:

The Commission did not certify the Company's proposed FLISR and IVVO projects as part of our 2019 IDP, and we are not actively pursuing those technologies at this time. The 15-year life the Company used for cost-benefit analysis purposes for the AMI investment is consistent with the established life of our current automated meter reading meters, and we believe provided a conservative view of the expected life. That being said, in our July 31, 2020 Annual Review of Remaining Lives Petition in Docket No. E,G002/D-2-0635, we requested the AMI meter life be 20 years, consistent with the guidelines from the manufacturer of the AMI meters that its assets will survive 20 years. The Commission voted to approve the Company's request of a 20-year life for AMI meters at the March 18, 2021 Agenda Meeting.

Preparer: Nick Paidosh
Title: Principal Analyst
Department: Regulatory Affairs
Telephone: 612-342-9034
Date: March 19, 2021

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Xcel Energy Information Request No. 1
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Please refer to Attachment 2, page 19, and answer the following related to the \$8.2 million in capital additions related to the IT component of the ADMS software and GIS Network Model Build improvement.

1. Did Xcel already begin to recover any of the \$8.2 million? If yes, please provide the amount recovered by year.
2. Is Xcel proposing to shift the full \$8.2 million to this TCR Rider?
3. Please explain why these costs were included in base rates rather than recovered through the TCR Rider.
4. Please explain why Xcel is proposing to collect these costs through the TCR Rider instead of its multi-year rate plan (MYRP).

Response:

1. Yes, these ADMS costs were included in base rates as approved in Docket No. E002/GR-15-826. These costs have now been included in the TCR Rider revenue requirements beginning with 2022 as shown on Attachment 8. Attachments 8A and 8B show the details of the \$8.2 million which were removed from the rider through 2021. Below is a summary of the annual amounts related to the IT components of the ADMS software and GIS Network Model Build and the amounts collected in base rates and the TCR rider:

Summary of ADMS Revenue Requirements (000's)				Proposed			
	2017	2018	2019	2020	2021	2022	2023
ADMS in Base Rates							
ADMS - GIS Model Improvements Base Rates Removal	25	40	1,136	1,136	1,136	-	-
ADMS - Software Base Rates Removal	452	661	801	801	801	-	-
Total ADMS in Base Rates	\$ 477	\$ 701	\$ 1,937	\$ 1,937	\$ 1,937	\$ -	\$ -
ADMS in TCR Rider							
ADMS - TCR Rider		1,172	1,980	2,799	5,185	5,895	5,941
less base removal	-	(701)	(1,937)	(1,937)	(1,937)	-	-
Total ADMS in TCR Rider	\$ -	\$ 470	\$ 43	\$ 862	\$ 3,248	\$ 5,895	\$ 5,941
Total ADMS	\$ 477	\$ 1,172	\$ 1,980	\$ 2,799	\$ 5,185	\$ 5,895	\$ 5,941

As discussed on pages 17-18 of Attachment 2 of our TCR Petition, costs relating to ADMS network equipment continues to be recovered through base rates due to the allocation process between Operating Companies. These costs are not included in the table above.

2. Yes, as part of the 2022 TCR filing, the Company is proposing that all previously approved ADMS capital costs (excluding labor) be collected in the TCR rider. The exception is ADMS network costs as noted in response to 1, above.
3. ADMS costs were not approved to be collected in the TCR Rider until after the approval of the 2016-2019 Multi-Year Rate Plan (MYRP), Docket No. E002/GR-15-826.
4. There are two reasons the Company is proposing to collect these costs through the TCR Rider rather than its MYRP: (1) to ensure there is no double recovery of any ADMS costs, and (2) having the recovery in one place will simplify reporting.

Preparer: Christopher Franks
Title: Principal Rate Analyst
Department: Revenue Requirements North
Telephone: 612-337-2007
Date: February 7, 2022

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Xcel Energy	Information Request No.	2
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the list of ADMS benefits described in Attachment 2, pages 3-7, which of these benefits can ADMS provide on its own, without other grid modernization components.

Response:

The benefits we articulated for ADMS are specific to our implementation initiative, which is nearly complete. However, both the Company and our customers may, in the future, need additional tools that further leverage the ADMS foundation in terms of DER enablement and management and reliability, for example. As DER penetrations increase, we move toward a future with non-wires alternatives helping to defer traditional infrastructure projects, and we need increased visibility and control capabilities for policy directives such as FERC Order 2222 – we will likely need to supplement our tools. But those tools will build on the foundational ADMS and other foundational advanced grid tools to expand our capabilities.

There is a similar case with reliability. We are already realizing the benefits we outlined in terms of ADMS enabling faster operator decisions during outage restoration, for example. But we are now also beginning to implement Fault Location Isolation and Service Restoration (FLISR), which is an advanced application that runs on the ADMS foundation. FLISR improves reliability through grid sensors and control devices that will provide further reliability efficiencies for our operations and service enhancements for customers in the form of reducing the number and duration of unplanned outages. However, we are only able to realize those benefits because the ADMS foundation is already in place.

So, while ADMS provides all of the listed benefits, we will continue to build on the ADMS foundation with additional technologies to further achieve and realize the listed benefits for our operations and for our customers as the grid changes, as our customers' expectations and needs change, as public policies evolve, and as we otherwise determine is necessary.

Preparer: Chad Nickell
Title: AGIS Delivery Lead
Department: System Planning and Strategy South
Telephone: 303-571-3502
Date: February 14, 2022

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Xcel Energy Information Request No. 3
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the list of ADMS benefits described in Attachment 2, pages 3-7, for each benefit that can only be achieved by ADMS in conjunction with other grid modernization components, specify the additional component(s) that will interact with ADMS to achieve this benefit.

Response:

Please see our response to DOC Information Request No. 2.

Preparer: Chad Nickell
Title: AGIS Delivery Lead
Department: System Planning and Strategy South
Telephone: 303-571-3502
Date: February 14, 2022

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Xcel Energy Information Request No. 4
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019
Integrated Distribution Plan

Referring to Attachment 2, page 1, please clarify what is meant by the term “business case-type” information.

Response:

“Business case-type” information refers to descriptions of the Company's ADMS investments and business justifications for the investments, including qualitative benefits to customers.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 5
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

The Commission's September 27, 2019 Order in Docket No. E002/M-17-797 required Xcel to:

include in any future cost recovery filing for ADMS investments an ADMS business case and a comprehensive assessment of qualitative and quantitative benefits to customers.

Please provide Xcel's position on whether the "business case-type" information that it has provided with respect to ADMS amounts to compliance with the above reference Commission directive.

Response:

Yes, the Company believes the information we provided is compliant with the referenced Order. We note that the information provided in our most recent TCR Petition (Docket No. E002/M-21-814) builds on and is consistent in terms of scope and detail to the information we provided in our 2019 TCR Petition (Docket No. E002/M-19-721). The Commission's December 10, 2021 ORDER AUTHORIZING RIDER RECOVERY, SETTING RETURN ON EQUITY, AND SETTING FILING REQUIREMENTS in our 2019 TCR proceeding notes at page 4, the Company's inclusion of a business case that argues the benefits of the ADMS will exceed its cost – and that the Department concluded it met the prior Order's requirements.¹ At page 5 of the Order, the Commission specifically found the business case information we

¹ See Order at page 4 (December 10, 2021) at:

<https://efiling.web.commerce.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={3092A57D-0000-CC11-9CCC-621D818F8CBB}&documentTitle=202112-180572-01>

provided “appropriately demonstrates the anticipated costs and benefits of the ADMS program. Accordingly, Xcel has fulfilled the requirements of Ordering Paragraph 6 of the prior TCR Rider order.”²

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

² *Id*

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Xcel Energy Information Request No. 6
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 2, pages 3-7, for each of the benefits listed, please indicate whether Xcel has a concrete plan for achieving this benefit, specifically addressing the timeline in which the benefit will be achieved and any other incremental investments required to achieve this benefit.

Response:

As explained in our response to DOC Information Request No. 2, no incremental investments are required to achieve the benefits we outlined for ADMS. We describe our implementation plan and its status on pages 9-12. ADMS is currently deployed to all three of our Minnesota Distribution Control Centers and our operators are beginning to utilize ADMS and realize its capabilities and functionalities. We describe how AMI will be integrated with ADMS and will further enhance the capabilities of ADMS on page 12. Finally, we outlined our plan to implement FLISR as part of our multi-year rate plan submitted October 25, 2021 in Docket No. E002/GR-21-630 to support further reliability enhancements for our customers.

Preparer: Chad Nickell
Title: AGIS Delivery Lead
Department: System Planning and Strategy South
Telephone: 303-571-3502
Date: February 14, 2022

Xcel Energy	Information Request No.	7
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Quantifying and/or monetizing these benefits would require speculation and subjective assumptions. Therefore, we categorize these benefits as qualitative.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 8
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 2, pages 3-7, for each of the benefits listed, please cite to any metrics that have been included in this application, including those proposed for other technologies, that will capture this benefit. If no such metrics were provided, please provide them in reply to this question.

Response:

As discussed in the pages referenced, all of the benefits we have identified for ADMS are qualitative, and as such, do not lend themselves to metrics.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-330-5601
Date: February 7, 2022

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Xcel Energy Information Request No. 9
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 2, page 5, please clarify what is meant by the phrase “multiple corporate objectives operating in the same area,” indicating whether these objectives are grid modernization components, traditional grid infrastructure, or something else entirely.

Response:

In this context, we mean that ADMS is serving multiple purposes. By having FLISR operate as an advanced application within the ADMS, we achieve the FLISR objectives, but do so in a more comprehensive way. For example, we explain that the ADMS-based FLISR ensures safety during FLISR operations, because ADMS has the requisite awareness of the impact FLISR device operations have on the grid as a whole; a standalone FLISR system would not have this. Another example is, when FLISR operates, ADMS considers generation from distributed energy resources when determining the switching, such that it does not impact the safety and reliability of the distribution grid; a standalone system may not be able to consider other interrelated and important factors.

Preparer: Chad Nickell
Title: AGIS Delivery Lead
Department: System Planning and Strategy South
Telephone: 303-571-3502
Date: February 14, 2022

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Xcel Energy Information Request No. 10
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 2, page 7-8, did Xcel measure the costs and benefits of any alternatives to ADMS? If yes, then please describe in detail. If no, then please explain why not.

Response:

As discussed in the pages referenced, there are no comparable alternatives to ADMS. At the time we initiated the ADMS project, it was the only comprehensive platform that could accomplish what is necessary to implement the Company's overall grid modernization initiative.

See also our Reply Comments (at page 12) in Docket No. E002/M-15-962, Biennial Distribution Grid Modernization Report – the proceeding where we sought, and the Commission granted, certification of ADMS for related discussion.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 11
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 2, page 7-8, did Xcel consider an alternative to ADMS that included both targeted improvements and autonomous systems? If not, then please explain why not.

Response:

An alternative to ADMS that includes both targeted improvements and autonomous systems would provide only the partial benefits from each approach, as discussed in the pages referenced, but this combination would still fall short of providing the broad range of capabilities provided by ADMS, which are necessary to implement the Company's overall grid modernization initiative.

See also our response to DOC Information Request No. 10 in this docket.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 12
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 8, would ADMS be cost effective if AMI, FLISR, and FAN were not to be installed? Please explain in detail.

Response:

As described in Attachment 2 of the Petition, as well as in our 2015 certification request in Docket No. E002/M-15-962, ADMS is a key foundational element for grid modernization. As such, ADMS is an enabling technology that provides direct benefits to our grid planning and operations today – and provides a necessary and important platform to build on for the future grid. The ADMS stood on its own as a foundational grid modernization investment in our request for certification, as certified by the Commission, and as it provides value to our operations every day. That said, each additional technology that further leverages the ADMS improves its value proposition.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 13
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: ADMS
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 2, page 3, please note any differences between the new grid capabilities and functionalities reported for ADMS in the instant filing, and those reported for ADMS in previous TCR filings.

Response:

The capabilities and functionalities for ADMS described in Attachment 2, Section III (pages 3-7) are substantively the same as those described in the Company's previous TCR Rider filings.

Preparer: Chad Nickell
Title: AGIS Delivery Lead
Department: System Planning and Strategy South
Telephone: 303-571-3502
Date: February 14, 2022

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Xcel Energy Information Request No. 14
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Please refer to Attachment 4, page 22, where Xcel states that “an advanced meter with DI would provide a pathway to expanded grid-facing and customer-facing benefits compared to first generation advanced meters” and answer the following:

1. Please list the expanded grid-facing and customer-facing benefits.
2. For each benefit listed in response (a) above, please explain whether the benefit is contingent on other grid modernization components besides AMI with DI and FAN.
3. For each benefit listed in response to (a) above, were these benefits quantified and included in Xcel's cost-benefit analysis (CBA)? If yes, please list each benefit and its resulting value. If no, please perform this analysis. If it is not feasible to do so, please explain why not.
4. Are the grid-facing and customer-facing benefits dependent on the implementation of new customer programs? If yes, please describe each program and the timeline for implementation.

Response:

1. Please see the Company's 2019 Integrated Distribution Plan in Docket No. E002/M-19-666, Appendix M1 Schedule 3 Advanced Grid Customer Strategy, the Company's 2021 Integrated Distribution Plan in Docket No. E002/M-21-694, Appendices B1 Grid Modernization and B2 Customer Strategy and Roadmap, and the Company's certification request for Distributed Intelligence, which is Appendix G of the Company's 2021 IDP. We also outline and provide requested details about the DI benefits in our responses to DOC Information Request Nos.

4, 9, 11, 12, 14, 17, 18, 19, 20, 26, 28, 40, 41, and 43 in Docket No. E002/M-21-694.

2. The benefits of DI rely on the Company's deployment of its selected AMI meters and the Field Area Network.
3. The Company's CBA for AMI is separate from its CBA for DI. Please see the executable CBA Model for DI, which we filed a Workpaper with our 2021 IDP filing on November 1, 2021 in Docket No. E002/M-21-694.
4. Please see our response to Part 1 above. We outlined the specific DI Use Cases we are proposing to implement at this time in Appendix G of our 2021 IDP. Appendix B2 of our 2021 IDP contains our Customer Strategy and Roadmap, which provides insights into the planned timing of various products and services associated with our advanced grid plans.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: Regulatory Affairs
Telephone: 612.330.5601
Date: February 14, 2022

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Xcel Energy Information Request No. 15
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 64, what is the failure rate of existing AMR and what is rate for AMI?

Response:

As documented and provided with the petition in MS Excel format "Att 4A - AMI_MN_Electric_CBA_Final_2021-V2 TRADE SECRET IN ENTIRETY.xlsx," in tab "BenefitsInputs" cells C7 and C8 respectively, the current average AMR failure rate is **[PROTECTED DATA BEGINS PROTECTED DATA ENDS]** while projected AMI failure rate is **[PROTECTED DATA BEGINS PROTECTED DATA ENDS]**.

Preparer: Pablo Martinez
Title: Risk Analyst
Department: Risk Management
Telephone: 303-571-7639
Date: February 14, 2022

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Xcel Energy Information Request No. 16
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 5, please explain how support for Xcel's existing meters will be provided through 2025 if meter replacement parts will no longer be available after 2022.

Response:

This year, we are making our final purchase of electric meters and natural gas modules compatible with our current automated meter reading service. We expect the quantities from this purchase and our existing stock to be sufficient for ongoing maintenance through 2025.

Preparer: Briston Jones
Title: Manager System Performance
Department: Meter Performance & Standards
Telephone: 303-294-2471
Date: February 14, 2022

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Xcel Energy Information Request No. 17
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 68, please explain why it is “difficult or impossible to quantify” the benefits associated with future-proofing the distribution grid.

Response:

Quantifying the benefits associated with future-proofing the distribution grid would require a great deal of speculation regarding a wide variety of intangible variables, including (but certainly not limited to) changes in weather and climate, technology advancements and adoption, changing laws and regulations, and customer behavior and preferences. As such, any attempt at analysis would consume significant resources and would not lead to a meaningful result.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 18
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 57, did Xcel consider replacement of AMI with AMR meters? Please explain why it did or did not.

Response:

As discussed in Section II of Attachment 4, our decision to transition to AMI as a replacement for our current AMR system reaching the end of its life is based on the value AMI technology will provide to our customers and our ability to operate the grid. AMR is a dated technology, and much of the industry has or is moving to AMI meters, as shown in Figure 1 of Attachment 4. AMI allows us the ability to expand the use of our meter system beyond basic billing functions for the benefit of our customers. It is also an important building block for our entire grid modernization strategy, which is driven by: (1) the Company's overall strategic priorities, (2) changing customer needs and preferences, (3) distribution system needs, and (4) Commission policy and stakeholder input. Also, as we discuss further in our response to DOC Information Request No. 19, AMR is not capable of achieving the future that we and our customers and stakeholders envision and expect.

Customers expect more from their energy providers than they have in the past, including greater choices and levels of service, greater control over their energy sources and their energy use, more optionality and increasing levels of service – and greater functionality and interaction in how those services are delivered. Our goal with our grid modernization strategy and plan, of which AMI and FAN are foundational components, is to use new technologies to transform the customer experience to meet the increasing customer demands for additional energy usage data,

as well as new products and services that will provide opportunities for customers to use that information to control usage.

We first discussed AMR compared to AMI and our thought process in choosing the AMI and FAN in our 2019 IDP in Docket No. E002/M-19-666. In addition to the narrative content in the body of our certification request in that proceeding, see Attachment M1 Direct Testimony of Michael C. Gersack for discussion of AMR and AMI in relation to customer, stakeholder, and policy expectations. Also, Attachment M2 Direct Testimony of Company Witness Kelly A. Bloch, Section V(D), provides a discussion of AMR as an alternative to AMI, as well as the value of AMI to our operations.

Preparer: Paul Davis
Title: Director Meter Reading
Department: AGIS and Metering
Telephone: 715-737-5603
Date: February 14, 2022

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Xcel Energy	Information Request No.	19
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 13, please confirm that all of the “additional capabilities” listed for AMI are only achievable through AMI and not through AMR or other meter alternatives.

Response:

First, we clarify that we did not assess, nor are we aware of, alternatives to AMR, AMI, or AMI with distributed intelligence capabilities. We also clarify that we are not aware that AMR meters can support distributed intelligence (DI) capabilities. That said, the primary differences between AMI and AMR are AMI's two-way communication capability, the ability to leverage DI, and AMI's superior timeliness and quality of data. For example, AMR meter communications are generally one-way – with the meter pushing information to the utility. AMI meters have two-way capabilities, which means that they can receive commands from the Company's systems. These include commands such as the Company's ability to remotely configure the meter to measure specific sets of energy parameters, perform meter firmware updates, or a command to open or close the internal service switch (remote connect and disconnect) and communicate its status. The AMI meters that we selected also have a second radio within the meter that is Wi-Fi compatible and can be configured to communicate with a customers' Home Area Network (HAN) and HAN devices, such as a customer's smart phone. We are not aware of AMR meters with HAN capabilities.

In terms of data, with AMI, customers will have access to 15-minute interval usage data that is updated approximately every four hours. With AMR, generally the data

available to customers is monthly usage that is updated once a month.¹ This timing is particularly detrimental to a customer who is on a time-of-use rate. Customers would not have access to information about when and how much energy they are using in a timely fashion, to be able to make informed and meaningful changes. The data also would not be in 15-minute increments; it would likely be in the time-of-use “blocks” of time. Again, the quality of the data is much less actionable, in that it does not afford the same level of granularity to inform customers about specific changes they can make to affect their usage and bill.

Another example is the automated outage reporting from AMI meters compared to AMR. Today, our Cellnet meters send a “last gasp,” but the AMR technology is less sophisticated, and in the case of a large-scale outage, very few of the last gasps actually make their way to the Company’s systems. This means the Company is reliant on customers to call or otherwise report a power outage. With AMI, we expect to receive a higher level of “last gasp” notifications and have the ability to query the meter with the two-way communications to confirm restoration.

While some AMR systems may provide a portion of these capabilities, they are not as comprehensive as AMI and generally not timely enough to realize full benefits from them.

Preparer: Paul Davis
Title: Director Meter Reading
Department: AGIS and Metering
Telephone: 715-737-5603
Date: February 14, 2022

¹ We clarify that with our current Cellnet AMR service, we are able to provide customers with approximated daily usage information, updated once per month.

Preparer: Paul Davis
Title: Director, Meter Reading
Department: AGIS and Metering
Telephone: 715-737-5603
Date: February 14, 2022

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Xcel Energy Information Request No. 21
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 66, please address whether there is any overlap between the CPP benefit and the TOU customer energy price savings benefit.

Response:

Typically, there is no overlap between a Critical Peak Pricing (CPP) and Time of Use (TOU) customer rate. As described on Attachment 4, page 66, the Company engaged The Brattle Group to model likely customer response TOU and CPP. The Brattle Group's study assumed TOU rates to be offered for a 5-hour period per day on **non-holiday weekdays** during the **entire year**. On the other hand, they assumed CPP to provide customers with a much higher discounted rate only 10 to 15 days per year, including **holidays** and **weekends**. Further, customers on a CPP rate are usually not also on a TOU rate. Finally, within The Brattle Group analysis, these customers were unique to each rate.

Preparer: Pablo Martinez
Title: Risk Analyst
Department: Risk Management
Telephone: 303-571-7639
Date: February 7, 2022

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Xcel Energy Information Request No. 22
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 67, for each of the qualitative benefits listed, please indicate why this benefit cannot be quantified and/or monetized.

Response:

Future opportunity and non-monetary benefits are inherently difficult to quantify because doing so would require speculation and subjective assumptions. Therefore, we categorize these benefits as qualitative.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 23
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 67, for each of the qualitative benefits listed, please indicate whether Xcel has a concrete plan for achieving this benefit, specifically addressing the timeline in which the benefit will be achieved and any other incremental investments required to achieve this benefit.

Response:

Benefit	Response
Improved customer choice and experience, leading to customer empowerment and satisfaction	Beginning with the receipt of the advanced meter, customers will immediately have access to their interval usage data via the customer web portal. Over the next several years, with the introduction of Distributed Intelligence, the insights available based upon this usage data will expand to include disaggregation by appliance, historical and neighbor comparisons, and energy saving tips. Within two years, services such as enhanced outage notifications and other personalized alerts and notifications will become available as AMI installations reach higher levels of penetration.
Enhanced DER integration	The timing of this benefit will be based on when AMI meters are deployed in different geographic areas and having the processes and tools in place to use AMI. The timeline for having the processes and tools in place is still in development.
Environmental benefits of enhanced energy efficiency	As the installed meter base reaches higher levels of penetration in 2023 and 2024, we will introduce both new CIP programs and enhancements to existing CIP programs to take advantage of the availability of AMI technology.

Improved safety to both customers and Company employees	This benefit will increase as meters are deployed and depends, in part, on the Company's proposal and Commission approval of remote disconnect/reconnect of meters for non-payment. The full benefits will be realized after all meters are deployed.
Improvements to power quality	The timing of this benefit will be based on when AMI meters are deployed in different geographic areas and having the processes and tools in place to use AMI. The timeline for having the processes and tools in place is still in development.

Preparer:	Andrew Quirk	Paul Davis
Title:	Manager Business Solutions and Results	Director Meter Reading
Department:	Advanced Grid Customer Solutions	AGIS and Metering
Telephone:	612-337-2024	715-737-5603
Date:	February 14, 2022	

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Xcel Energy Information Request No. 24
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 67, for each of the benefits listed, please indicate whether this benefit will be achieved through the operation of AMI alone or through the interaction of AMI with other grid modernization components. If the benefit is achieved interactive, specify which components will interact with AMI to achieve this benefit.

Response:

The referenced page outlines qualitative benefits associated with AMI and FAN. As we explain, each of these capabilities and resulting customer benefits are enhanced by our implementation. Specifically, AMI and FAN deliver more granular data that provides more visibility into the distribution systems and also enhances the accuracy of our field asset data used by ADMS, LoadSEER, and other tools. That said, other future technologies may be helpful or necessary to achieve some of the listed benefits. For example, while AMI and FAN will give us needed visibility into distributed energy resources (DER), enhancing our integration capabilities by providing more system awareness – at some point, we expect we will also need a Distributed Energy Resources Management System (DERMS) for more granular and sophisticated monitoring and potentially control of DER. There are likely other technologies that we may need in the future as our customer's needs and expectations change and evolve.

Preparer: Beth Chacon
Title: Director Grid Strategy & Emerging Technology
Department: Distribution Electric Engineering
Telephone: 303-571-3542
Date: February 14, 2022

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Xcel Energy	Information Request No.	25
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 69, please address whether there is any overlap between the power quality improvements benefit and the DER integration benefit.

Response:

AMI will monitor and provide power measurement and voltage data at customers' point of service within the distribution system, which we will use in load flow and other calculations to enable improvements in power quality. This will help monitor and verify voltage is within acceptable limits from the substation all the way to the customers' point of service. This type of monitoring of power quality information was previously not available and will help us respond to out-of-range voltages that may interfere with electronic devices in customers' homes or businesses. That said, these power quality improvements are an overall benefit for all customers, but that also includes power quality benefits for distributed energy resources.

The DER integration benefit results from the more timely and more granular data on the flow of energy to and from our customers. With this load flow information, and with voltage, current, and power quality data provided from AMI to ADMS, our system operators will be able to facilitate the integration of greater amounts of distributed generation onto the system. The bi-directional capabilities of the AMI meters also allow the ability to perform net metering for our DER customers without the need to change out the existing meter – we can effect this change remotely, saving the cost of a meter change. Additionally, the AMI system will capture voltage and usage data that can be compared with nameplate or operational limits of our equipment. Using this data, we will be able to identify problems such as solar causing high secondary voltage, or transformer overload due to either a strong presence of

EVs (load) or high reverse flows (such as solar generation). It is our intention to leverage AMI data for this purpose, which will allow us to enable DER while at the same time maintain reliability and power quality for each of our customers.

Finally, AMI will enable the development of more accurate load profiles, which are used by ADMS to build improved system models for planning and operational purposes. Initially, ADMS will be using relatively few profiles to represent typical customer loads. Once AMI is fully in place for a year, we will develop more refined profiles that will significantly improve our models. This data will then support planning and operational modeling, enabling us to more accurately identify problems (or the lack thereof) as more load or DER hosting is contemplated for the system.

Preparer: Chad Nickell
Title: AGIS Delivery Lead
Department: System Planning and Strategy South
Telephone: 303-571-3502
Date: February 14, 2022

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Xcel Energy Information Request No. 26
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 69, does Xcel view integration of DER as a benefit in its own right, as a means to achieving other benefits, or both? Please provide a detailed response.

Response:

We have significant distributed energy resources (DER) interconnected to our system, which we believe will continue to increase. We view DER as an important part of our clean energy transition – and we are taking actions at both the distribution and bulk system levels to enable and support DER integration, and to plan and operate our system differently to realize the benefits of DER as part of our clean energy transition.

As noted in our Reply Comments in our currently pending Integrated Resource Plan in Docket No. E002/RP-19-368, the Alternate Plan we proposed marks the end of an era. We no longer plan to rely on large central station power for resource additions and will continue our move toward a diverse resource mix that is distributed across the region. This move requires thoughtful planning to ensure reliability and maximize efficiencies while increasing the amount of variable generation on the grid.¹ We also noted that we are open to working with parties on future modeling efforts to examine appropriate methods and costs to use to model distributed solar as a selectable resource, rather than incorporating it at an assumed adoption level as we have in past plans.²

¹ See pages 32-33 (June 25, 2021).

² *Id* at page 98.

Similarly, in our 2021 Integrated Distribution Plan in Docket No. E002/M-21-694, we explain that for the distribution system, the clean and customer-driven energy revolution has necessitated a shift in our approach to planning and operations. Designing the system to achieve our ambitious vision and customers' increasing reliance on electric service, while maintaining the existing system and keeping costs low, creates challenges as well as opportunities. We must be able to reliably deliver a cleaner mix of utility scale energy, integrate increasing amounts of carbon-reducing distributed energy resources and, at the same time, meet and efficiently integrate new levels of energy demand from electric vehicles and other beneficial electrification.³ We go on to explain that as we look out over the next five years and our distribution budgets, we have three strategic priorities: (1) addressing our aging assets; (2) enabling the clean energy transition; and (3) modernizing the grid. We are planning investments to support each of these priorities including an increased focus on asset health and reliability investments, investments in electronic reclosers to support DER, and investments in new AMI meters and supporting infrastructure to modernize the grid.⁴ We discuss DER as part of our clean energy transition in more detail starting at page 11. We discuss our view of other aspects of DER and its integration into our system, planning, and operations throughout the IDP, including several Appendices, including our discussion of Integrated Distribution-Transmission-Resource Planning in Part IV of Appendix A1, and in Appendix F, where we outline a change we propose to make in how we value and assess DER as part of our non-wires alternatives (NWA) process beginning in 2022; it considers an expanded set of benefits, aligns the cost-benefit screening process with how we currently expect to structure potential NWA load reduction contracts in the future, and it has the effect of improving NWA project cost-benefit screening performance.

Preparer: Bria Shea
Title: Director Regulatory & Strategic Analysis
Department: NSPM Regulatory
Telephone: 612-330-6064
Date: February 14, 2022

³ See page 1 (November 1, 2021)

⁴ *Id* at page 2.

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Xcel Energy Information Request No. 27
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 69-70, please clarify whether one of the sections titled "Power Quality Improvements" has been mislabeled, and if so, please provide a correction.

Response:

In the pages referenced, we use "Power Quality Improvements" as a general term. Subsections 2 and 6 describe different benefits that broadly relate to power quality. In hindsight, we could have consolidated these into a single, longer subsection.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 14, 2022

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Xcel Energy Information Request No. 28
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 71, and the reference to “a future that includes greater DER, DI, and greater customer engagement,” please address whether Xcel believes that its future system will include greater DER, DI, and customer engagement independent of whether its proposed grid modernization investments are implemented, or only if its proposed grid modernization investments are implemented.

Response:

Over time, the levels of DER on the system have increased, and we have also begun to implement strategies and tactics to take advantage of DI technologies and achieve deeper customer engagement. We would expect these activities to generally increase, absent our proposed grid modernization investments. That said, our proposed investments accelerate these advancements, and without these investments, we do not expect to be able to achieve optimal levels of these outcomes for our customers.

Preparer: Andrew Quirk
Title: Manager Business Solutions and Results
Department: Advanced Grid Customer Solutions
Telephone: 612-337-2024
Date: February 7, 2022

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Xcel Energy Information Request No. 29
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 56, please provide the revised FAN capital cost forecast after removal of the \$60 million contingency placeholder.

Response:

Fully reflecting the changes to the Current Estimate that would result from removal of the \$60 million contingency placeholder in proper context also requires adjustments to O&M.

The revisions include removing approximately \$60 million of capital and approximately \$2 million of O&M from the Current Estimate, which correlate to a reduction of approximately \$52 million of capital from the 2019 Certification. For ease of reference, we provide both the original and a revised Table 4 below.

**ORIGINAL Table 4: Variance Analysis – FAN Costs – Capital and O&M
2019 Certification Request Compared to Current Estimates
NSPM Electric (Millions)**

	Current Estimate	2019 Certification	Difference
Capital	\$98.1	\$92.6	\$5.5
O&M	\$6.4	\$8.1	(\$1.7)
TOTAL	\$104.5	\$100.7	\$3.8

**REQUESTED Table 4: Variance Analysis – FAN Costs – Capital and
 O&M 2019 Certification Request Compared to Current Estimate, with \$60
 million contingency placeholder removed
 NSPM Electric (Millions)**

	Current Estimate <i>(With the \$60 contingency placeholder removed)</i>	2019 Certification	Difference
Capital	\$41.1	\$92.6	(\$51.5)
O&M	\$4.9	\$8.1	(\$3.2)
TOTAL	\$46.0	\$100.7	(\$54.7)

Preparer: Catherine Ostazeski
 Title: Financial Forecasting Consultant
 Department: AGIS Finance
 Telephone: 612-215-4651
 Date: February 14, 2022

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Xcel Energy Information Request No. 30
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 7, please indicate what the basis is for the claim that “Today, customers expect that we know them and take a personalized approach to their relationship with us; they expect we keep them informed and use our expertise to advise them about what to do and then empower them to take those actions; and finally, that we deliver seamless experiences for them reducing the burden on them to take action.” In responding to this question, please cite to any research that has been conducted by Xcel or other entities that supports this assertion, and specifically note any quantitative results (e.g., from surveys) supporting this characterization of customer wants.

Response:

See Docket No. E002/M-19-666 2019 Integrated Distribution Plan, Attachment M1 Direct Testimony of Company Witness Michael A. Gersack. In Schedule 3 – Advanced Grid Customer Strategy, Section II discusses primary and secondary customer research that supports this claim. In Schedule 8 – Customer Communication and Education Plan, Section 3 discusses best practices and customer research results specific to customer communications.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy	Information Request No.	31
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: AMI
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 55, please confirm that the costs that are presented in Table 1 for AMI and in Table 2 for FAN reflect the partial assignment of some AMI and FAN costs to the TOU pilot. If confirmed, please provide an updated benefit-cost analysis results (i.e., benefit cost ratio) for AMI that reflects the full costs of these technologies without any partial assignment of costs to the TOU pilot.

Response:

Attachment 4, page 55, Table 1 for AMI and Table 2 for FAN do not include costs for the MN TOU Pilot, because we are distinguishing them separately for cost recovery purposes. The benefit-cost analysis for the AMI and FAN initiatives that is included in our Petition, however, includes AMI and FAN costs for the MN TOU Pilot. It is appropriate for the AMI and FAN costs associated with the TOU Pilot to be included in any CBA for AMI and FAN, because the 17,500 meters and associated FAN infrastructure are, in effect, an early portion of our overall AMI and FAN implementation in Minnesota.¹ As a result, removing that equipment from the CBA would not be fully representative of a full Minnesota AMI and FAN deployment. Additionally, because the TOU Pilot includes only a total of 17,500 customers out of the approximately 1.4 million AMI meters and associated FAN infrastructure we will deploy in Minnesota as part of our overall implementation of AMI, removing those

¹ TOU Pilot customers will receive an Itron Riva 4.2 meter as part of the Company's full AMI and FAN implementation to replace the earlier version of AMI meter that they received at the outset of the TOU Pilot, which was prior to the Company's selection of the Itron Riva 4.2 meter. See Section X of Attachment 4 for more information regarding our mass deployment and Footnote 20 on page 71 of Attachment 4 for information regarding the meter equipment for TOU Pilot participants.

costs would have a very minimal effect on the CBA – moving the ratio from 1.01 to 1.02.

Preparer:	Catherine Ostazeski	Pablo Martinez
Title:	Financial Forecasting Consultant	Principal Risk Management Analyst
Department:	AGIS Finance	Risk Analytics
Telephone:	612-215-4651	303.571.7639
Date:	February 14, 2022	February 14, 2022

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Xcel Energy Information Request No. 32
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Advanced Planning Tool
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the description of quantifiable benefits of LoadSEER on page 18 of Attachment 5, please answer the following:

1. Does Xcel plan to conduct a benefit-cost analysis to justify approval and cost-recovery of future non-wires alternatives (NWA), energy efficiency, or other DERs used to defer distribution system upgrades?
2. If the answer to (a) above is yes, please explain how the deferral value for that avoided feeder or other system upgrade will not be double counted with the benefit Xcel is claiming for LoadSEER?

Response:

1. We outline and discuss our current and proposed future approach to NWA analysis in Appendix F of our 2021 Integrated Distribution Plan in Docket No. E002/M-21-694. This analysis includes assessment of energy efficiency and various other DER.
 2. LoadSEER is a distribution system planning tool. Page 18 of Attachment 5 notes that LoadSEER may aid in deferring system upgrades due to its improved precision over our legacy planning tools. The distribution system deferrals that may arise from an NWA analysis are specific to a specific capacity risk circumstance that our annual planning process identifies. This is wholly separate and different than our estimated system-wide planning improvement we attributed to LoadSEER. As such, there is no cross-over or possibility of double-counting.
-

Preparer: Brian Monson
Title: Manager System Planning & Strategy
Department: System Planning & Strategy
Telephone: 763-493-1811
Date: February 7, 2022

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Xcel Energy Information Request No. 33
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Advanced Planning Tool
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Please provide the workbooks detailing the method, inputs, and Benefit-Cost Analysis described in Attachment 5, page 17, Table 4 in machine readable Excel format with formulae included.

Response:

We provided the Trade Secret Cost-Benefit Analysis model for the Advanced Planning Tool in native format as a Workpaper with our 2019 certification request in Docket No. E002/M-19-666. We provide it here in Microsoft Excel format as Trade Secret Attachment A.

The Advanced Planning Tool CBA model represents a Company work product. Xcel Energy maintains this information as a trade secret pursuant to Minn. Stat. §13.37 (1)(b) based on its economic value from not being generally known and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use.

Additionally, some data contained within the model is also maintained as trade secret based on its economic value from not being generally known and not being readily ascertainable by proper means by other persons who can obtain value from its disclosure or use, and/or contains proprietary customer and system data. This additional trade secret data includes negotiated and contractual pricing.

Please note the CBA is marked as "Non-Public" in its entirety. Pursuant to Minn. R. 7829.0500, subp. 3, we provide the following description of the excised material:

1. **Nature of the Material:** The Cost Benefit Analysis Model developed by the Company.
2. **Authors:** Risk Analytics and Regulatory and Distribution
3. **Importance:** The Company work product is proprietary to the Company.
4. **Date the Information was Prepared:** The CBA Model was created in the third quarter of 2019.

Preparer: Pablo Martinez
Title: Sr Principal Risk Analyst
Department: Risk Management
Telephone: 303-571-7639
Date: February 14, 2022

**PUBLIC DOCUMENT
NOT PUBLIC DATA HAS BEEN EXCISED**

The Advanced Planning Tool CBA model represents a Company work product. Xcel Energy maintains this information as a trade secret pursuant to Minn. Stat. §13.37 (1)(b) based on its economic value from not being generally known and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use.

Additionally, some data contained within the model is also maintained as trade secret based on its economic value from not being generally known and not being readily ascertainable by proper means by other persons who can obtain value from its disclosure or use, and/or contains proprietary customer and system data. This additional trade secret data includes negotiated and contractual pricing.

Please note the CBA is marked as “Non-Public” in its entirety. Pursuant to Minn. R. 7829.0500, subp. 3, we provide the following description of the excised material:

1. **Nature of the Material:** The Cost Benefit Analysis Model developed by the Company.
2. **Authors:** Risk Analytics and Regulatory and Distribution
3. **Importance:** The Company work product is proprietary to the Company.
4. **Date the Information was Prepared:** The CBA Model was created in the third quarter of 2019.

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Xcel Energy Information Request No. 34
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Regarding the summary of benefit-cost analysis results in Attachment 4, pages 59-61, please explain what the Company means in indicating that the AMI benefit-cost analysis has been conducted from the “customer perspective,” given that it includes capital and operational benefits to Xcel and carbon dioxide emissions reduction benefits. In responding to this question, please address how the perspective used in the Company's BCA relates to common cost tests, including the utility cost test, the societal cost test, and participant cost test.

Response:

The CBA we performed attempted to assess the overall costs and benefits of AMI and FAN to our overall customer base – comparing the estimated costs of the investments and quantifying expected benefits where we believe the benefits can be reasonably monetized. As explained in our response to DOC Information Request No. 35, most of the benefits in our assessment are expressed in terms of Company efficiencies and reductions in outage durations. (*See* also our response to DOC IR No. 42, which provides additional information on avoided economic losses to the customer due to reduced outage duration.) These efficiencies accrue to customers – not the Company – and will be realized by customers as either a reduction in future revenue requirements or increased efficiencies, which customers realize as our ability to perform more work with the same level of resources. That said, we also estimated the value of reduced carbon dioxide emissions related to load shifting from on-peak to off-peak hours. (Also see our response to DOC IR No. 43.) If in referring to “utility cost test, the societal cost test, and participant cost test,” the question is asking for an analysis of how the CBA we conducted for AMI and FAN compares to cost-

benefit evaluations commonly applied to conservation improvement programs (CIP), we have not performed such an assessment.

Preparer: Pablo Martinez
Title: Sr Principal Risk Analyst
Department: Risk Management
Telephone: 303-571-7639
Date: February 14, 2022

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Xcel Energy	Information Request No.	35
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Will any of the benefits listed in Tables 7, 8, and 9 in Attachment 4 result in lower rates to customers? If yes, did Xcel account for these savings in its rate and bill impact analysis? If no, please explain why not.

Response:

First, we note that the actual revenue requirements and TCR Adjustment Factors associated with our cost recovery request are detailed in Section VII of our TCR Rider Petition.

Second, yes, there are some benefits that will reduce costs to customers over time and are memorialized in business area budgets including: (1) the avoided O&M meter reading cost, which equates to the amounts the Company would have paid to Cellnet for meter reading services; (2) the benefit we expect from the AMI remote reconnect/disconnect capabilities, which falls under "Reduction in Field and Meter Services" in Table 8 on page 61 of Attachment 4;¹ and (3) the avoided cost of AMR meter purchases after AMI deployment is complete. We clarify, however, any savings from the reductions in these business area budgets would be reflected as part of a rate case outcome, not the TCR Rider. The TCR Rider captures and recovers approved project

¹ The savings associated with remote disconnect/reconnect capabilities are predicated on Commission approval of a future Company proposal that will fully utilize those capabilities. We expect to make that proposal in the first half of 2022.

costs, which in this case are specific 2021-2022 revenue requirements that include our mass deployment of AMI and FAN in Minnesota.²

Third, our cost-benefit analysis for AMI and FAN nets the budgeted AMI and FAN project expenditures and costs compared to identified benefits. Many of the benefits identified in the cost-benefit analysis are efficiencies that will not directly translate to lower customer bills. For example, outage management efficiencies that we also discuss in our response to DOC Information Request No. 39 are expected to reduce outage durations for customers because we will be able to locate and resolve unplanned outages more efficiently. These efficiencies are expected to allow our crews to focus on actual outages, which allows them to more quickly complete restoration after a storm, for example. The benefits to customers are a better experience and less economic impact on them due to shorter outage durations, which we discuss in our response to DOC IR No. 42. So, while we have estimated a quantifiable benefit due to this operational efficiency – and both the operational efficiency and the customer experience are important benefits – neither directly translates to a customer bill.

Fourth, there are some benefits listed under these tables, such as carbon emissions reductions with an environmental value and energy price shifting with a consumption savings value, that are not related to “lowering rates.”

The long-term bill impact estimate we developed as part of our certification request in our 2019 IDP (and included for illustrative purposes in our TCR Petition) is based on the 2020-2024 revenue requirements associated with our 2019 AGIS certification proposal. As we have explained, the Reference Case is an illustrative AMR Drive-By system, which we provided because taking no action to replace our meters is not an option. Because the cost aspect of this long-term bill impact estimate is AGIS project-based, it does not reflect the business area budgets where the avoided O&M meter reading cost and AMI remote reconnect/disconnect efficiency noted above are reflected. So, while that is not specific to the avoided costs associated with the sunset of our current AMR system, it is representative of what an AMR replacement system would have cost. As a result, we believe it is reasonably representative of the incremental cost of our 2019 AGIS proposal – of which, AMI and FAN comprise approximately 87 percent of the total, as outlined in our response to DOC IR No. 68.

² Minn. Stat. § 216B.16, subd. 7b allows for recovery, through an automatic adjustment mechanism of charges, the Minnesota jurisdictional costs of certain new transmission facilities, distribution facilities and planning investments that support grid modernization efforts, and five certain Midcontinent Independent Transmission System Operator (MISO) charges associated with regionally planned transmission projects.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-330-5601
Date: February 14, 2022

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Xcel Energy Information Request No. 36
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Regarding the discussion of AMI benefits on page 62 of Attachment 4, please answer the following:

1. At what point in time will customers be able to respond to price signals?
2. Is Xcel aware of other utilities that offer time-of-use or peak pricing without AMI meters? If yes, please list the utility and program.
3. Could Xcel offer an on-peak/off-peak pricing program without deployment of AMI meters? If no, please explain why not.
4. How will Xcel ensure that the benefits created through AMI coupled with FAN are not double counted with the benefits of demand response programs or other similar load shifting programs offered through its Conservation and Load Management Plans?

Response:

1. As a necessary first step in developing three-period Time of Use (TOU) rates, the Company is currently piloting a three-period residential TOU rate for about 10,000 residential customers, which the Commission certified in its August 7, 2018 Order in Docket No. E002/M-17-775. The residential pilot will conclude on October 31, 2022.

The Company also will pilot a three-period TOU rate for commercial and industrial customers. The Company's proposal for this pilot is pending in Docket No. E002/M-20-86. These three-period TOU service pilots will allow the

Company to test, calibrate, and bill these rates, as well as to provide customers more insight into their usage patterns.¹

The Company expects to roll out three-period TOU rates more broadly to customers after these pilots are fully complete and evaluated. The exact timing of that implementation has not yet been determined and depends in part on the pilot results and the ability to leverage pilot learnings into successor rate designs. The Company will work with customers and other stakeholders to share pilot learnings and plans for future-state TOU rates when pilot outcomes are available.²

We also note that we submitted a draft rate design roadmap in an October 1, 2020 Compliance Filing in Docket No. E002/M-19-666; this includes a high-level timeline for development and implementation of new rate designs.

2. The Company is not aware of what technology is in use at other utilities.
3. Billing customers on TOU rates requires the metering equipment at the customer premise to measure and track the customer usage attributes required by the rate. AMI meters are able to broadly measure and track customer usage in 15-minute intervals that the Company's backend systems then use to calculate their bills based on their assigned rates. Measurement and tracking of 15-minute usage intervals produce an enormous amount of data, and AMI meters broadly support that level of data. Additionally, the two-way communication capabilities of AMI meters allow utilities to program or reprogram the meters from our offices – without a field visit or meter replacement. Data support and two-way communication capabilities are extremely important factors when considering the implementation of required or broad-based TOU rates.

That said, some AMR meters can also be programmed to measure and track interval data, but it requires a special meter with that capability. Tracking interval data for on-peak/off-peak pricing also requires the meter to be physically programmed to measure the specific usage attributes needed to properly bill the customer's rate before it can be installed at the customer premise. Therefore, a customer changing to a different rate, or any changes in the requirements for the assigned rate, would require a field visit to exchange the existing meter for one that we have programmed as needed, so that it tracks the proper usage attributes going forward. We use our current AMR system for existing two-period rates. For the

¹ The Company currently offers optional two-period Time of Day rates for residential and commercial customers. In addition, General Time of Day Service is required for all non-residential customers that have a 15-minute measured demand equal to or greater than 1,000 kW.

² Our response to DOC Information Request No. 56 includes the metrics that will be included in our mid-point and final reports for the residential TOU pilot.

two-period rates, the meters are programmed to “sum” the usage in each of the specific time periods (e.g., it takes a meter reading at the start of the 9:00 a.m. on-peak period and another reading at the end of the on-peak at 9:00 p.m. and does the same overnight for the off-peak period). Any change to those timeframes requires us to reprogram the existing meter or replace it with a new meter that is programmed with the new parameters. The other complicating factor with AMR meters and TOU rates is the amount of data that broad-based TOU rates require. An AMR system is not generally built to support the gathering of interval-level data from a large number of customers or supplying the interval data to the customers in a timely manner to manage their energy use.

For these reasons, AMI meters are essentially necessary to bill three-period TOU and other complex rates widely across all customers.

4. AMI and FAN are enabling and foundational advanced grid investments that will help to facilitate programs such as those referenced in the question. For purposes of our cost recovery request in the TCR Rider Petition and as described in Attachment 4, page 62, the benefits such as reduction in theft, inactive meters, bad debt, and outage duration are distinct in nature and unrelated to the demand response benefits of CPP, TOU and Carbon Emissions included in our CBA for AMI and FAN. Therefore, with respect to the CBA, the benefits were not double counted.

That said, these are estimates and not tied to specific proposals. Going forward, each of these will be considered in their respective contexts. For example, a proposal for a specific demand response program or rate will be predicated on the existence of AMI; those program proposals will not include the cost of AMI. Similarly, any benefits will be those that are expected from the behavior change associated with customer program/rate participation in a specific rate or program. In a sense, this could be considered a “true-up” of an earlier benefit estimate.

At the outset of an investment such as this, we are working to identify a reasonable set of expected and estimated benefits that our operations and our customers should expect. But ultimately, we will not be proposing a TOU or demand response program in the context of AMI and FAN. It is not practicable to expect that all Company and customer-facing programs, services, or efficiencies that were enabled by or expected to benefit from AMI and FAN will always be measured through the lens of our AMI and FAN proposal. Demand response, TOU, and perhaps other advanced rates will be proposed, considered, and – if approved – monitored in the context of that specific program or rate proposal.

Preparer: Lisa Peterson
Title: Manager Regulatory Analysis
Department: Regulatory Affairs
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Date: February 14, 2022

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Xcel Energy	Information Request No.	37
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 63, please provide the basis for the estimate that AMI meters will provide a one percent reduction in capital and O&M expenditures for Asset Health and Reliability projects and Capacity projects.

Response:

This category of benefits is based on our belief that AMI will provide a wealth of information about the workings of the distribution system – and that this AMI data can be aggregated at varying levels of the distribution system including tap, transformer, and service lines amongst other distribution system equipment. We expect to use this data to prioritize distribution grid improvements and more efficiently plan and design the system. Through the aggregated AMI data, we will have greater insights into the nature of the load – specifically load profiles, which will help us evaluate risk. The voltage insights will help us prioritize areas for investments in tap, transformer, and secondary wire replacement. For instance, the AMI data can be aggregated at the transformer level to identify overloaded transformers as well as determine the optimal transformer for replacement transformers. We will also have tools to better understand system losses which will help us evaluate opportunities for investment to minimize these losses.

We believe we will realize these benefits with future Asset Health and Reliability projects and Capacity projects. We based our one percent estimated benefit on our examination of past projects in these two budget categories, and determined that it was a reasonable estimate of the capital expenditure reduction that will result from the data provided AMI meters. In addition, our one percent estimated benefit is

consistent with the percentage utilized in the CBA performed by Ameren Illinois when it sought approval for its AMI deployment.

To calculate this benefit, we used an average of the actual capital expenditures in the capital budget categories of Asset Health and Reliability and Capacity over a five-year period (2014 through 2018). This average capital expenditure was then multiplied by one percent to calculate the reduction in capital expenditures resulting from AMI.

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Department: Distribution Planning
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Date: February 14, 2022

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Xcel Energy Information Request No. 38
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 63, please explain why Xcel did not seek to quantify reduction in line losses.

Response:

As discussed in our Integrated Distribution Plan – most recently in our 2021 IDP filed November 1, 2021 in Docket No. E002/M-21-694 – line losses are estimated based on engineering calculations. We have no capability to measure actual line losses. Without the ability to directly measure them or some other non-subjective basis on which to base a quantification, we consider this benefit to be qualitative.

Preparer: Brian Monson
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Department: System Planning & Strategy
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Xcel Energy	Information Request No.	39
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 64, please explain the method used to quantify benefit of outage management efficiency.

Response:

This benefit is based on the expectation that AMI will enable increased outage management efficiencies by providing automated outage notification and restoration confirmation (power-on information) to the Company's Outage Management System (OMS). Power loss information is identified by an AMI meter's last gasp. Outage notification from the AMI meters will provide the Company with a timelier and more accurate scope of an outage. The automated outage information provided by the AMI meters will then assist the Company in restoring power more quickly. AMI will also enable more efficient outage restoration because the AMI will provide more detailed outage location information that will reduce the time and expense in locating the outage. Finally, we will have better information about single-customer outages to avoid dispatching field personnel to customers whose power has already been restored or whose power is out because of a tripped circuit breaker or some other issue on the customer side of the meter. Overall, because of these increased outage management efficiencies, AMI enables quicker response and restoration to customer outages to minimize inconveniences or economic losses that could be experienced by the customer.

To calculate our estimated ten percent reduction in storm-related capital costs due to the efficiencies gained from the information provided by the AMI meters, we examined historic storm-related capital expenditures. In light of the improved outage

information, we determined that a ten percent reduction was a reasonable estimate of the expected efficiency that will result from the data provided by AMI meters.

For the specific amount used in the CBA, we utilized an average of our storm-related capital expenditures for the five-year period between 2014 and 2018. This average storm-related capital expenditure was then multiplied by ten percent to calculate the benefit resulting from AMI deployment.

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Department: Distribution Control Centers
Telephone: 612-330-7648
Date: February 14, 2022

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Xcel Energy Information Request No. 40
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 64, did Xcel calculate the reduction of time and expense in locating, scoping, and responding to an outage? If yes, please provide that value. If no, please explain why not.

Response:

Please see our response to DOC Information Request No. 39 for an explanation of outage management efficiency.

Preparer: Troy Browen
Title: Senior Director
Department: Distribution Control Centers
Telephone: 612-330-7648
Date: February 14, 2022

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☐ Public Document – Not Public Data Has Been Excised
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Xcel Energy Information Request No. 41
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 64, did Xcel quantify increases customer satisfaction through quicker response and restoration to customer outages? If yes, please provide that value. If no, please explain why not and what steps Xcel will take to quantify it in the future.

Response:

No, we did not. Overall customer satisfaction is influenced by a variety of factors, including perceived frequency, duration, communications, and the customer's overall experience with outages. It is difficult to disaggregate these factors, and as such we have not attempted to quantify this benefit at this time. With respect to the outage experience in particular, we currently survey customers who receive outage notifications regarding their satisfaction with those communications and expect those measures to improve as a result. We would be open to making the results of these surveys available as part of our Annual Service Quality Report or Performance-Based Ratemaking Annual Report.

Preparer: Andrew Quirk
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Date: February 14, 2022

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Xcel Energy	Information Request No.	42
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 64, did Xcel quantify avoided economic losses experience by the customer? If yes, please provide the method and resulting value. If no, please explain why not and what steps Xcel will take to quantify it in the future.

Response:

Yes, we estimated and included in our Cost Benefit Analysis (CBA) for AMI and FAN, avoided losses to the customer due to reduced outage duration.

For this benefit category, we estimated that AMI meters will help reduce outage length, resulting in direct benefits for customers through three improvement areas that impact Customer Minutes Out (CMO): (1) better identification of nested outages during storm events; (2) reduction in response time for single customer events; and (3) faster response to tap level events. For each activity, we determined the value of these CMO reductions based on the Interruption Cost Estimate (ICE) Calculator developed by Lawrence Berkeley National Laboratory (LBNL).¹

The ICE Calculator estimates the value of an interruption from a customer viewpoint. LBNL bases the value for commercial and industrial customers on their costs due to an outage, and for residential customers, the amount that they would be willing to spend to avoid an outage. It incorporates studies, analyses, and econometric models to determine these values and is widely used by utilities and government agencies across the country to estimate the costs of service interruptions and the value of reliability improvements.

¹ The ICE Calculator is available at: <https://icecalculator.com/home>.

We estimated the NPV avoided losses to the customer related to reduced outage duration at approximately \$14.3 million.

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Department: Risk Management
Telephone: 303-571-7639
Date: February 14, 2022

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Xcel Energy Information Request No. 43
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 66, does the time-of-use (TOU) emissions change reflect the changing composition of the electric grid over time? Please explain why or why not.

Response:

Yes, the referenced estimates account for changing composition of the electric grid over time. The Company's estimate associated with "avoided carbon emissions," related to system demand response from On-Peak to Off-Peak, were assumed in connection with PLEXOS' average emissions simulations.

Preparer: Pablo Martinez
Title: Sr Principal Risk Analyst
Department: Risk Management
Telephone: 303-571-7639
Date: February 7, 2022

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Xcel Energy Information Request No. 44
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 66, does the TOU emissions change account for reductions from energy efficiency measures and programs? Please explain why or why not.

Response:

As previously described in Information Request No. DOC-43, the Company estimated "avoided carbon emissions" related to system demand response from On-Peak to Off-Peak. The non-conventional DR savings estimated by The Brattle Group, such as TOU and CPP, are assumed to be incremental to our existing conventional DR portfolio that includes energy efficiency measures and other programs.

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Title: Sr. Principal Risk Management
Department: Risk Management
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Date: February 7, 2022

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Xcel Energy Information Request No. 45
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Benefit-Cost Analysis
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 66, do the TOU and Critical Peak Pricing (CPP) energy and demand reductions account for impact of Xcel's current and future Conservation and Load Management programs? Please explain why or why not.

Response:

Xcel Energy's current Conservation Improvement Program in Minnesota does not include TOU or CPP efforts. Additionally, the demand reductions estimated by The Brattle Group and utilized in the IDP assumes demand reductions incremental to our existing demand response portfolio as shown in our recent Demand Response Compliance filing submitted in Docket No. E002/M-20-421 on February 1, 2022. Also see our response to DOC Information Request No. 36, part 4, which discusses these types of programs.

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Department: Program Policy and Strategy
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Date: February 14, 2022

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Xcel Energy Information Request No. 46
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Cost Recovery
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to page 9 of the main application, please explain why TOU pilot costs were recovered through base rates rather than through the TCR rider mechanism?

Response:

A portion of the TOU Pilot was included in base rates because of timing. When the Company filed its Multi-Year Rate Plan (MYRP) in Docket No. E002/GR-15-826, the TOU Pilot had not yet been developed and thus no costs had been specifically assigned to the TOU Pilot. However, the Company budgeted costs related to FAN which were included in the 2016 test year MYRP. Those initial FAN costs included in the MYRP were later allocated between the TOU Pilot and FLISR at the time of the Company's grid modernization certification request filed in Docket No. E002/M-17-776. Both the TOU Pilot and FLISR will benefit from the FAN WiMAX infrastructure included in the 2016 test year MYRP.

To ensure there is no double-recovery of those FAN costs during the 2016 MYRP period, we have not included costs related to the TOU Pilot prior to 2022 in this TCR Rider revenue requirements because a portion of those costs were included in our MYRP filed in Docket No. E002/GR-15-826. We removed TOU Distribution and Business Systems costs from the recently filed MYRP in Docket No. E002/GR-21-630 consistent with the removal of the other Distribution-Grid Modernization projects, beginning with the 2022 test year.

Preparer: Rebecca Eilers
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Department: NSPM Regulatory
Telephone: 612-330-5570
Date: February 7, 2022

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Xcel Energy Information Request No. 47
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Cost Recovery
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Does Xcel anticipate that any costs associated with the AGIS initiative will be recovered through base rates in the future? Please provide a detailed response.

Response:

At this time, we have proposed discrete advanced grid initiatives. We have received certification for ADMS, AMI, FAN, and a time of use (TOU) pilot, and are largely seeking recovery of those costs through the TCR Rider. We are currently seeking certification of Distributed Intelligence and a Resilient Minneapolis Project, which, if granted, we expect we will seek cost recovery in a future TCR Rider. As we explain in our November 2021-2022 TCR Rider Petition and our response to DOC Information Request No.1, a portion of ADMS costs are being recovered through base rates. Also, as detailed in the Direct Testimony of Ms. Kelly A. Bloch in our pending multi-year electric rate case in Docket No. E002/GR-21-630, we are planning to implement Fault Location Isolation and Service Restoration (FLISR) in Minnesota – and we are seeking cost recovery of that initiative as part of our rate case request.

We do not have specific plans at this time regarding how we intend to pursue other specific advanced grid technologies. We would expect, however, we will continue to utilize a mix of base rates and rider recovery mechanisms, depending on the specifics of the proposal.

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Xcel Energy Information Request No. 48
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: FAN
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 25, what other utilities did Xcel benchmark communications solutions against?

Response:

The Company benchmarked communication solutions for the AGIS FAN with multiple other utilities through organizations such as the Electric Power Research Institute (EPRI) and the Utilities Technology Council. During significant meetings with EPRI's 161 Program, which focuses on communications and security for utilities, and that program's predecessor program, numerous utilities worked together to define requirements, test vendor solutions, and provide recommendations on approach and technology at the time. The Company also held separate review sessions with other utilities that had deployed field area networks or were researching them as the Company was.

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Title: Director OT Networks
Department: Business Systems
Telephone: (651) 639-4448
Date: February 7, 2022

Preparer: Wendall Reimer
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Date: February 14, 2022

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Xcel Energy Information Request No. 51
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: FAN
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 34, what is the difference in latency between the FAN and the cellular alternative?

Response:

Latency can vary greatly, depending on the specific location and circumstances including storms or other events where cellular usage increases drastically resulting in increased latency. Under normal conditions, the latency associated with a public carrier solution such as contemplated in DOC Information Request No. 50, will generally be acceptable given current requirements of the Company's meters and most Distributed Automation (DA) devices. However, in situations where the carrier's network is under stress, the latency can vary significantly whereas, in comparison, a private backhaul solution will remain steady and predictable. With the FAN, the Company's meters and DA devices have multiple Access Points (AP) they can connect to, improving their ability to consistently connect and communicate. Whereas with individual cellular connections to individual meters, the latency and reception for each meter could be different and, in some cases/geographical locations, it could be challenging to get consistent cellular connectivity.

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Xcel Energy Information Request No. 52
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: FAN
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, pages 34-35, what is the cost difference between FAN and the AMI communications network?

Response:

We understand this question to be asking for the cost difference between a converged, multi-purpose FAN, such as we are implementing, and a dedicated AMI network that would not serve the communications needs for other field equipment such as distributed controls and sensors/distribution automation equipment. Internal studies indicate that the total cost to support separate networks versus a converged FAN network would be approximately 60 percent more (i.e., the cost of capital and O&M to build and support two different networks was 1.6 times the cost of the FAN).

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Date: February 14, 2022

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Xcel Energy Information Request No. 53
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: FAN
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 34-35, at what point in time will the FAN be connected to the diverse list of devices (meters, capacitor banks, sensors, etc.)?

Response:

The installation of the FAN precedes AMI installation by about six months. Distribution automation devices, such as capacitor banks, sensors, and reclosers, currently communicate through public cellular on a general basis. However, as noted on page 27, the WiSUN endpoint devices may also include new distribution automation devices in the future.

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Date: February 14, 2022

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Xcel Energy Information Request No. 54
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: FAN
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Regarding shifting the budget for WiMAX to the outer years as described on page 56 of Attachment 4, please explain why Xcel is not removing the cost in this filing if it is known that it will not be used.

Response:

At the time the July 2021 budgets were finalized for use in the Company's multi-year rate plan (MYRP) filed October 25, 2021 in Docket No. E002/GR-21-630 and this Petition, the Company had not yet made the decision to remove the referenced WIMAX costs from those outer years. That decision was subsequently made, and will be reflected in future budget iterations.

Preparer: Cathy Ostazeski
Title: Financial Forecasting Consultant
Department: AGIS Finance
Telephone: 612-215-651
Date: February 14, 2022

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Xcel Energy Information Request No. 55
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: FAN
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the improvement in the 2019 CBA described on page 59 of Attachment 4, please explain each change that contributed to the improvement in the results.

Response:

As described in Attachment 4, page 59, there were adjustments made to both costs and benefits. Regarding costs, the refreshed version includes an increase in FAN costs due to 100 percent allocation to AMI, a refinement of capital and O&M estimates for business systems, and an adjustment of general O&M operational costs estimates. With respect to benefits, there is a substantial increase because of the extension of the useful life of the AMI, from the initial conservative 15 years to 20 years, resulting in the addition of benefits without further capital investment required.¹

Preparer: Pablo Martinez
Title: Sr Principal Risk Analyst
Department: Risk Management
Telephone: 303-571-7639
Date: February 7, 2022

¹ See Attachment 4 at pages 17-18, where we discuss the expected service life and accounting life of the AMI and FAN equipment. The 20-year average service life for the AMI meters was approved in the Commission's March 24, 2021 Order in Docket No. E,G002/D-20-635.

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Xcel Energy Information Request No. 56
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: General
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 4, please indicate what the basis is for the claim that "Customers want access to actionable information, more choice and greater control of their energy use – and they expect a smarter, simpler, and more seamless experience." In responding to this question, please cite to any research that has been conducted by Xcel or other entities that supports this assertion, and specifically note any quantitative results (e.g., from surveys) supporting this characterization of customer wants.

Response:

See our response to DOC Information Request No. 30. The customer research referenced in that response provides the basis for the referenced claim.

Preparer: Karin Haas
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-321-3116
Date: February 7, 2022

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Xcel Energy Information Request No. 57
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 87, please list the metrics that AMI and FAN may impact. Please describe the type of impact. How will Xcel quantify the contribution that AMI and FAN has on each metric?

Response:

All of the metrics that have a "Yes" in the "Provide/Frequency" column of Tables 11-19 are impacted by AMI and FAN. We note the method that we intend to use to calculate each of the line items in the "Calculation/Notes" column of Tables 11-19.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-330-5601
Date: February 7, 2022

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Xcel Energy Information Request No. 58
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 89, please explain why Xcel has not proposed metrics related to its TOU pilot. Please propose annual metrics related to the TOU pilot such that the performance of this pilot can be measured.

Response:

Metrics to measure the performance of the TOU Pilot were proposed, vetted, and approved by the Commission in Docket No. E002/M-17-775. The Commission's August 7, 2018 Order in that docket requires that the following metrics be included in a mid-point report (at approximately 15 months) and final report (at approximately 27 months):

- a. Participation metrics, including the number of customers who have opted out of the TOU rate;
- b. Customer bill impacts;
- c. Customer satisfaction indicators, including:
 - i. quantification of the relative impacts of the TOU rate on customers' bills compared to the current residential rate and
 - ii. identification of groups that are disproportionally impacted either positively or negatively.
- d. Total peak demand savings achieved by participating customers, and incremental load curve data at an hourly or sub-hourly level by:
 - i. assessing how various customer groups within the Residential class change their consumption behavior during peak times in response to the proposed rate structure; and

- ii. analyzing how certain household characteristics impact responsiveness to peak price signals.
- e. Track customers who self-identify as LIHEAP eligible separately from customers who are LIHEAP recipients, and preserve the data for analysis;
- f. Customer satisfaction engagement by:
 - i. measuring and tracking customer satisfaction, preferences, attitudes, acceptance, and comprehension; and
 - ii. understanding drivers for active customer participation.
- g. Energy usage changes by:
 - i. measuring how various customer groups within the Residential class change their overall consumption patterns in response to the proposed rate structure;
 - ii. and determine how consumption changes during off-peak (high renewable hours);
- h. Post-pilot takeaways must include:
 - i. evaluating new capabilities of advanced meter infrastructure meters; and
 - ii. assessing impacts of the TOU rate on the Company's revenue recovery.
- i. In the final report, Xcel must include recommendations for including net metered customers in TOU tariffs, including any necessary changes to the Company's net metering and/or cogeneration tariffs, based on engagement with and feedback from stakeholders.

We expect to file the midpoint report about March 1, 2022.

Preparer: Rebecca Eilers
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-330-5570
Date: February 7, 2022

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Xcel Energy Information Request No. 59
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 89, please explain why Xcel has not proposed metrics related to ADMS. Please propose annual metrics related to ADMS such that performance of this project can be measured.

Response:

The ADMS project was certified by the Commission in Docket No. E002/M-15-962 in 2016, is nearly fully in-service, and we have been recovering its project costs since our first cost recovery request in 2017 in Docket No. E002/M-17-797. As discussed in Attachment 2 of our TCR Petition, all of the benefits are qualitative, and as such, do not lend themselves to metrics. Attachment 2 also discusses our experience with the tool, now that it is being used in all three of our Minnesota Control Centers. We also discuss our implementation of ADMS in our Advanced Distribution Management System Annual Report compliance filings submitted January 24, 2020 in Docket Nos. E002/M-19-666 and E002/M-17-797; January 25, 2021 in Docket Nos. E002/M-19-666, E002/M-19-721, and E002/M-20-680; and January 25, 2022 in Docket Nos. E002/M-21-694 and E002/M-21-814.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: Regulatory Affairs
Telephone: 612.330.5601
Date: February 14, 2022

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Xcel Energy Information Request No. 60
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 89, please explain why Xcel has not proposed metrics related to APT-LoadSEER. Please propose annual metrics related to APT-LoadSEER such that performance of this project can be measured.

Response:

As discussed in Attachment 5, starting at page 17, the overwhelming majority of benefits we identified for LoadSEER are qualitative, and thus do not lend themselves to specific measurement. They are, however, important to the Commission's expectations and requirements for Integrated Distribution Plans, as we discuss in Attachment 5 and in Appendix A1 of our 2021 IDP.¹ That said, we believe the most practicable measurement for LoadSEER would be a comparison of our planned timeline to implement its advanced features compared to when we actually implement them. We outline these implementation milestones in Section VI of Attachment 5, and note that we would be open to reporting our progress in an ongoing manner. We believe any reporting on our implementation should be done in future Integrated Distribution Plan filing to ensure proper context.

Preparer: Brian Monson
Title: Manager System Planning & Strategy
Department: Distribution Planning
Telephone: 763-493-1811
Date: February 14, 2022

¹ See Xcel Energy 2021 Integrated Distribution Plan, Docket No. E002/M-21-694 (November 1, 2021).

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Xcel Energy Information Request No. 61
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Table 11 on page 90 of Attachment 4, what does "Reporting" indicate in the right column?

Response:

The "reporting" column of Table 11 is intended to specify the context of where each line item of information would be reported. As explained in the referenced dockets, we believe project-specific information, such as installation statistics, customers opting-out, or visits to the new web portal, are best provided in the context of the AGIS initiative. Where we note "AGIS / SQ," we believe the best place for reporting may be in an existing service quality report. For example, utilities already report customer complaints in their Annual Service Quality Reports under the Minnesota Rules – and in a specific Customer Complaints Annual Report; complaints regarding AMI could be a separate category of complaints in these existing service quality reports.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-330-5601
Date: February 7, 2022

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Xcel Energy	Information Request No.	62
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, pages 87-97, please explain why Xcel has not proposed targets and associated timelines for any proposed metric? Please propose goals and associated timelines for all proposed metrics.

Response:

As we discussed in Docket No. E999/CI-20-627 initiated by the Department to examine potential metrics, performance evaluation methods, and consumer protection conditions to be applied to our AMI and FAN projects the Commission certified, it is necessary to first gather and report data before finalizing any specific performance measures or thresholds. This has been the approach the Commission has taken with respect to our Quality of Service (QSP) tariff, and even more broadly in the Commission's inquiry into performance-based metrics (PBM) and incentives in Docket No. E002/CI-17-401.¹ In that case, the Commission adopted a performance incentive mechanism (PIM) process, and with that – a set of metric design principles, goals, and outcomes. The process and framework the Commission adopted also recognizes the importance of a period of data gathering and reporting, which we proposed be a period of three years to determine which of the metrics are the correct ones to track and whether they remain valid as time goes by.

In this case, we proposed a set of deployment-related reporting (Table 11 of Attachment 4). Other parties proposed other reporting associated with aspects of the deployment or benefits that we outlined. We have agreed to track and report nearly all of those recommended items, as we outlined in pages 87-97. However, as we have noted, a baseline period of time where the data is tracked and reported is needed

¹ See Xcel Energy Comments (September 25, 2020).

before targets or thresholds are identified. Aside from deployment-related items, this data gathering period needs to begin after we have fully completed deployment. This is essential and consistent with the recognition of the importance of sufficient, consistent, actual performance data to inform standards and metrics as the Commission has done, for example, in our QSP proceeding and the PBM proceeding. Further, we have agreed to report on more than 50 items. We agree these are important to keep the Commission apprised of our implementation progress and on other commitments we have made as part of the proposed initiative. However, all of these may not end-up being meaningful as time goes by. As such, as our implementation progresses, it will be important to establish meaningful goals and outcomes, so that the right set of metrics can be identified, and targets can be developed in the proper context. Also see our response to DOC IR No. 64.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: Regulatory Affairs
Telephone: 612.330.5601
Date: February 14, 2022

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Xcel Energy Information Request No. 63
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, pages 87-97, please explain why Xcel has not proposed targets related to each proposed metric. Please propose goals related to each proposed metric to the extent practicable.

Response:

Please see our response to DOC Information Request No. 62.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-330-5601
Date: February 7, 2022

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Xcel Energy Information Request No. 64
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, pages 87-97, please describe how Xcel will determine whether its AGIS investments have created the benefits cited in the TCRR if it does not have goals and targets related to the proposed metrics.

Response:

Please see the Company's response to DOC Information Request No. 62 with respect to the timing of any metric goals or targets. First, not all of the reporting items we have agreed to report are benefits. Second, some of the items have built-in goals. For example, in Table 13 – the percentage of meters deployed compared to the planned installation; there is also a similar item for the FAN. We will be reporting on various aspects of the budgets compared to actuals. Third, some do not lend themselves to a performance target. For example, the number of customers who opt-out of an AMI meter; that is purely a customer choice – as is the number of customers who set-up an account to view their energy usage. We will be monitoring these and may take action to affect customer behavior – but these are customer choices, and not necessarily reflective of the Company's performance. Finally, there are others that we will be monitoring, so we can take corrective action if needed – but a target or threshold would not be in order for those either. For example, we will be monitoring customer complaints and customer satisfaction. These do not require a target for the Company to learn from and adjust its processes or take other actions.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: NSPM Regulatory
Telephone: 612-330-5601
Date: February 7, 2022

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Xcel Energy Information Request No. 65
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 9, what is the basis for targeting reliability performance in the top third of U.S. utilities? In answering this question, please address how Xcel balances the sometimes-competing aims of minimizing costs and maximizing reliability.

Response:

Providing safe, reliable, and adequate electric service to our customers is not only part of our regulatory compact – it is a core area of focus. Assessing performance relative to other U.S. utilities is common in the industry, and we believe, an important benchmark. A better-than-average reliability performance of a utility compared to its peers suggests that the utility is attentive to providing its customers with excellent service. Balancing the relationship between the cost of service and reliability performance is a fundamental issue to utility operations and rates. There is no perfect measure or mechanism to do this – but comparing our performance relative to our peers is one way to ensure that we are not lagging the industry, and at the same time, that we are not pursuing unrealistic or excessive performance targets.

We recognize this, as does the Minnesota Public Utilities Commission. We report our Minnesota reliability performance to the Commission regularly, where it is monitored and compared to historic or other performance targets and industry benchmarks. Reliability targets for our Minnesota service territory are contained in our Annual Electric Service Quality Report, which sets the thresholds each year under the Minnesota Rules (most recently in Docket No. E002/CI-21-237). Our most recent Order in the Minnesota Rules report states in part:

The Commission hereby sets Xcel Energy's 2020 Minnesota service territory-wide Reliability Standard at the IEEE [Institute of Electrical and Electronics Engineers] benchmarking second quartile for large utilities.¹

Our August 20, 2021 Supplement in that proceeding provides the 2020 IEEE benchmarking data and shows that, on a Minnesota service territory-wide basis, the Company met the reliability thresholds for SAIFI, SAIDI, and CAIDI for 2020 at the IEEE benchmarking second quartile for large utilities.

Preparer: Michael Renman
Title: Principal Engineer
Department: Distribution System Performance
Telephone: 616-566-4918
Date: February 14, 2022

¹ See Order at Order Point No. 11 in Docket No. E002/M-20-406 (in the Commission's December 18, 2020).

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Xcel Energy Information Request No. 66
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Metrics and Targets
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to Attachment 4, page 9, does Xcel intend to maintain its goal of achieving reliability performance that is in the top third of U.S. utilities independent of any trends in overall utility reliability performance? In answering this question, please address whether Xcel believes that maintaining this relative ranking is important even if U.S. utility performance overall is improving?

Response:

Please see our response to DOC Information Request No. 65.

Preparer: Michael Renman
Title: Principal Engineer
Department: Distribution System Performance
Telephone: 616-566-4918
Date: February 14, 2022

Preparer: Martha Hoschmiller
Title: Case Specialist II
Department: NSPM Regulatory
Telephone: 612-330-5973
Date: February 7, 2022

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Xcel Energy	Information Request No.	68
Docket No.:	E002/M-21-814	
Response To:	Minnesota Department of Commerce	
Requestor:	Matthew Landi / Courtney Lane / Ben Havumaki	
Date Received:	January 28, 2022	

Question:

Topic: Rate Assessment
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the discussion of the Estimated Customer Rate Impact beginning on page 56 of Attachment 4, please confirm that the long-term rate impact analysis only includes the costs of AMI and FAN?

Response:

We clarify that Section VII of our Petition outlines the actual 2021-2022 revenue requirements and resulting TCR Rider Adjustment Factors for the TCR Rider projects and charges identified in the Petition, which include the advanced grid projects. These are the actual costs for which we are seeking cost recovery and the actual amounts that would be recovered from our customers.

With respect to the long-term rate impact estimate we included in our Petition, we realized as we were responding to this Information Request that a portion of the discussion and the summary Table in Section VIII of our TCR Rider Petition suggests the long-term rate impact analysis is comparing only the costs of AMI and FAN to a reference case for a drive-by AMR system. This is incorrect. As we explain on page 56, we took this analysis directly from our certification request in our 2019 Integrated Distribution Plan in Docket No. E002/M-19-666, because the costs had not significantly changed since that time and as a result, we believe it continues to be a reasonable approximation of the incremental cost of AMI and FAN. That analysis compared our overall AGIS proposal, which included AMI, FAN, FLISR and IVVO, in the 2019 IDP to a reference drive-by AMR case. The final paragraph at the bottom of page 57 should have read:

...We calculated the bill impact by using the revenue requirements for the AMR drive-by reference case compared to the ~~AMI and FAN~~ AGIS revenue requirement and calculated the estimated bill impact as described above...

Similarly, the first row of Table 5 should have been characterized as “AGIS,” as we provide below.

**REVISED Table 5: Illustrative Monthly Bill Impact –
 Typical Residential Customer using 675 kWh
 (2020-2024 Period)**

	Year 1	Year 2	Year 3	Year 4	Year 5
AMI and FAN <u>AGIS</u>	\$0.44	\$1.33	\$1.84	\$2.58	\$2.87
Reference Case	\$0.01	\$0.19	\$0.62	\$1.18	\$1.51
<i>Difference</i>	<i>\$0.43</i>	<i>\$1.14</i>	<i>\$1.22</i>	<i>\$1.40</i>	<i>\$1.36</i>

Finally, footnote 17 should have read:

¹⁷ The five-year budget period was 2020-2024. The costs include AMI, FAN, FLISR, IVVO, and the AMI and FAN costs associated with the certified Residential TOU pilot.

We apologize for our inadvertent error in being inconsistent in this section. That said, the overwhelming majority of the AGIS costs are for AMI and FAN, so we continue to believe the illustrative impact to a typical residential customer is reasonable and representative of our AMI and FAN implementation. We believe it is helpful to see the relative scale of these investments. So, we provide below a modified Table 2 from our 2019 IDP and certification request that shows the relative scale of each AGIS component to each other and the AGIS whole, with AMI and FAN being approximately 87 percent of the total.¹

¹ See original Table 2 at page 14 of the 2019 Xcel Energy IDP, Docket No. E002/M-19-666 (November 1, 2019).

Modified 19-666 Table 2: Grid Modernization Capital Expenditures Budget – NSPM Electric (Millions)

	MYRP Case Period			5-Year Period	Total (2020-2024)	Percent of 2020-2024 Total
Component	2020	2021	2022	2023-2024		
AMI ²	\$14.0	\$28.9	\$144.0	\$185.2	\$372.1	69.3%
FAN ³	\$14.7	\$37.3	\$36.8	\$3.8	\$92.6	17.2%
FLISR	\$3.5	\$8.6	\$6.6	\$18.8	\$37.5	7.0%
IVVO	\$0.1	\$6.5	\$9.8	\$18.6	\$35.0	6.5%
Total	\$32.3	\$81.3	\$197.2	\$226.4	\$537.2	

Modifications from the Original Table 2 are: (1) deleted the ADMS row, as it is not included in the bill impact analysis and made corresponding update to the Total row, (2) deleted 10-year Period column, because the long-term bill impact estimate was based on the 2020-2024 period, (3) added a 2020-2024 total for each AGIS Component, (4) added a Percent of 2020-2024 Total for each AGIS Component.

Preparer: Jody Londo
 Title: Regulatory Policy Specialist
 Department: Regulatory Affairs
 Telephone: 612.330.5601
 Date: February 14, 2022

² Includes the TOU Pilot.

³ Includes the TOU Pilot.

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Xcel Energy Information Request No. 69
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Rate Assessment
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the statement that the analysis illustrated “the incremental revenue requirement and estimated bill impact of AGIS implementation” on page 57 of Attachment 4, please list the AGIS technologies that were included in this analysis.

Response:

Please see our response to DOC Information Request No. 68.

Preparer: Jody Londo
Title: Regulatory Policy Specialist
Department: Regulatory Affairs
Telephone: 612.330.5601
Date: February 14, 2022

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Xcel Energy Information Request No. 70
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Rate Assessment
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the discussion of the Estimated Customer Rate Impact beginning on pages 56-58 of Attachment 4, does Xcel anticipate that all customer classes will experience the same rate and bill impacts as the residential sector? If yes, please explain why. If no, please explain why not.

Response:

No. In conducting an estimated or bill impact analysis such as this, the Company attempts to allocate the incremental costs to each customer class as they would be allocated in a general rate case. The costs that are outlined in a certification request in the context of an IDP, or the costs we outline in our narrative description of our planned initiatives in the TCR Rider Petition are assigned to FERC codes pertaining to the General and Common cost categories. In a rate case, all General and Common costs are allocated using the Production, Transmission and Distribution (PTD) allocator, which is based on the total Original Plant in Service for PTD plant that has been allocated to customer class using data generated outside the CCOSS model that best reflects why the costs were incurred. This external data includes class loads, energy, and number of customers. When conducting the rate impact analysis, the Company applied the PTD allocator that was used in its 2022 Class Cost of Service Study (CCOSS) that was included in its multi-year rate plan filed October 25, 2021 Docket No. E002/GR-21-630. The class PTD allocator used for that rate case is shown below.

<u>Allocator</u>	<u>Residential</u>	<u>Commercial Non-Demand</u>	<u>C&I Demand</u>	<u>Lighting</u>	<u>Total</u>
General & Common PTD Allocator	41.37%	3.16%	54.62%	0.84%	100.00%

As a result, the rate impact for each customer class will vary based on how the incremental revenue requirement is allocated to class (as noted with the PTD allocator shown above), divided by the forecast sales for each class. We shared the residential result of this analysis because it is representative of the overwhelming majority of our customer base and is a common point of reference for utility cost impacts.

See Section VII of our TCR Rider Petition for the actual revenue requirements and actual TCR Rider Adjustment Factors we are proposing for the investments and costs included in our request. Section VII, Part A specifically discusses differences in how we treat transmission and distribution costs and how they are allocated to classes.

Preparer: Michael Peppin
Title: Principal Pricing Analyst
Department: Regulatory Analysis
Telephone: 612-337-2317
Date: February 14, 2022

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Xcel Energy Information Request No. 71
Docket No.: E002/M-21-814
Response To: Minnesota Department of Commerce
Requestor: Matthew Landi / Courtney Lane / Ben Havumaki
Date Received: January 28, 2022

Question:

Topic: Rate Assessment
Reference(s): Xcel Energy's 2021-2022 TCRR Petition; Xcel Energy's 2019 Integrated Distribution Plan

Referring to the discussion of the Estimated Customer Rate Impact beginning on pages 56-58 of Attachment 4, does Xcel anticipate that customers receiving an AMI meter will experience bill savings from saving energy? Please explain why or why not.

Response:

The existence of an AMI meter will not cause customers to save energy or experience bill savings. Customers will need to change behaviors or take other actions, such as making efficiency improvements at their premises. Saving energy is what will result in bill savings. All customers will have the opportunity to experience bill savings from the AMI-enabled tools, services, and granular usage information we plan to offer. These will empower customers to take the actions necessary to realize measurable energy savings, and therefore bill savings.

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Telephone: 612-337-2024
Date: February 14, 2022

Preparer: Martha Hoschmiller
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Date: February 7, 2022

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
Public Reply Comments**

Docket No. E002/M-21-814 and E002/M-20-680

Dated this 2nd day of **May 2022**

/s/Sharon Ferguson

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Lise	Trudeau	lise.trudeau@state.mn.us	Department of Commerce	85 7th Place East Suite 500 Saint Paul, MN 55101	Electronic Service	No	OFF_SL_21-814_M-21-814
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