BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

In the Matter of Northern States Power Company's, d/b/a Xcel Energy, 2020-2034 Upper Midwest Integrated Resource Plan	PUC Docket No. E-002/RP-19-368 **XLI REPLY COMMENT**

The Xcel Large Industrials ("XLI")[1] submit this reply comment in accordance with the most recent notice of comment period issued by the Minnesota Public Utilities Commission ("Commission") in PUC Docket No. E-002/RP-19-368 related to Xcel's 2020-2034 Upper Midwest Integrated Resource Plan ("IRP"),[2] and in response to initial comments filed by other stakeholders.[3] From the perspective of a large industrial customer, Scenario 15 supported by XLI could provide more than $3 million in savings during the years 2022 to 2026 compared to Xcel Energy's Preferred Plan, while still achieving:

- A 75% reduction in carbon emissions from 2005 levels by 2030, while at the same time preserving the option to accelerate that reduction to over 80% in the next IRP;
- Nearly 4,000 MW of new solar and wind resource capacity by 2034, for a total of more than 9,000 MW of total renewable resources on Xcel's system, which is roughly 80% of the Midcontinent Independent System Operator ("MISO") system peak demand during the planning period; and
- Flexibility to respond to transmission and other operational challenges as the region continues its decarbonization transition.

These achievements surpass many of the goals in Minn. Stat. § 216C.05, subd. 2. Unfortunately, one goal that they fail to achieve is that set forth in subdivision 2(4), which requires that rates be 5% below the national average. This problem will likely be exacerbated by Xcel Energy's cost

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1 XLI is an *ad hoc* consortium of large industrial customers of Northern States Power Company d/b/a Xcel Energy ("Xcel" or the "Company") consisting for purposes of this filing of Flint Hills Resources Pine Bend, LLC; Marathon Petroleum Corporation; and USG Interiors, Inc.

2 Notice of Extended Reply Comment Period (Mar. 30, 2021) (eDocket No. 20213-172370-01) (extending the reply comment deadline to June 25, 2021) (the "Notice"). XLI's initial comment was filed pursuant to the Fourth Notice of Extended Comment Period (Dec. 28, 2020) (eDocket No. 202012-169367-01) (extending the initial comment deadline to February 11, 2021).

3 Initial Comment with Exhibit A by XLI (Feb. 11, 2021) (eDocket No. 20212-170891-02) ("Initial Comment").

recovery filings over the next five years, which may surpass $1 billion – a more than 40% increase, excluding fuel costs. Therefore, XLI urges the Commission to be extremely cautious in approving any other scenarios or alternative plans that would add further cost burdens on ratepayers and respectfully requests that the Commission remain mindful and open to rate design options that could facilitate competitive rates and bills for large industrial customers.

I. INTRODUCTION

On July 1, 2019, Xcel submitted its IRP to the Commission. Following Xcel's initial filing, the Commission noticed a comment period seeking initial comments by November 8, 2019, with reply comments due on January 8, 2020.[4] After various procedural extensions, Xcel filed its supplemental IRP filing on June 30, 2020.[5] The need for the additional IRP Supplement was predicated upon the Commission's order denying Xcel's request to purchase the Mankato Energy Center ("MEC"), a 720 MW natural gas combined-cycle power plant located in Mankato, Minnesota.[6] Xcel's initial IRP included modeling assuming MEC as an owned asset; however, after the MEC Order, the Commission recognized the need for updated and accurate modeling reflecting MEC's continued status as a power-purchase-agreement resource.[7] The filing of the IRP Supplement was further delayed by the outbreak of the COVID-19 pandemic. The comment process on the IRP Supplement was inevitably delayed as well, and pursuant to the Commission's Fourth Notice of Extended Comment Period, XLI and other stakeholders filed initial comments on or around February 11, 2021.

XLI remains an active participant in this docket, filing its Initial Comment on February 11, 2021, issuing discovery, and filing a petition to intervene on August 13, 2019.[8] In addition to its active role in this docket, XLI also retained J. Kennedy and Associates, Inc. ("J. Kennedy") to provide expert analysis on the IRP. In that capacity, J. Kennedy prepared an expert report attached to the Initial Comment as Exhibit A.[9] In addition to the Initial Comment and expert analysis, XLI

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4 Notice of Comment Period (July 3, 2019) (eDocket No. 20197-154179-01).

5 Supplement (June 30, 2020) (eDocket No. 20206-164371-01) ("IRP Supplement").

6 *In the Matter of a Petition by Northern States Power Company, d/b/a Xcel Energy, for Approval of the Acquisition of the Mankato Energy Center*, PUC Docket No. E-002/M-18-702, Order Denying Petition and Requiring Supplement Modeling (December 18, 2019) ("MEC Order").

7 *Id.* at 6-10.

8 XLI Petition to Intervene (Aug. 13, 2019) (eDocket No. 20198-155171-02).

9 Expert Report by J. Kennedy (Feb. 11, 2021) (the "Report").

also submits this reply comment[10] – with an additional expert report attached hereto as Exhibit B[11] – to underscore its support for Xcel's Scenario 15 and to emphasize specific policy objectives it urges the Commission to consider when evaluating Xcel's IRP.

II. ANALYSIS

For decades, the Commission's rules have contemplated a balance of a variety of impacts, including those on the ratepayer (rates and bills), utility, community, environment, and reliability. Minn. R. 7843.0500, subp. 3. The legislature has also directed the Commission to consider similar factors, recently adding direction on ratepayer impacts via the addition of a state energy policy goal that rates for each customer class be at least 5% below the national average. Minn. Stat. § 216C.05, subd. 2(4). XLI appreciates this thoughtful and important policy goal crafted by the legislature, and this reply comment reinforces what XLI submitted in its Initial Comment. Namely, that Scenario 15 in Xcel's IRP best balances the Commission's regulations and state policy goals. Xcel's Preferred Plan, and those proposed by other stakeholders, place too much emphasis on one or two goals, which detrimentally impact costs and could diminish reliability.

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[10] Pursuant to the Notice, this reply comment will be filed nearly two years after Xcel's initial filing. While grateful for the robust record created by Xcel and other stakeholders in this docket and with the understanding that Xcel submitted the IRP Supplement on June 30, 2020, XLI is concerned about the resources required for ratepayers and other parties to participate in what are becoming increasingly complex proceedings. These concerns are only exacerbated by the increasing regularity of large rate-impact and resource-mix determinations occurring outside of the traditional regulatory process. XLI suggests that these various miscellaneous proceedings necessarily undermine the underlying assumptions of the IRP process, leaving ratepayers, and indeed the Commission, with an obscured view of the size, type, and timing decisions called for in resource planning and without a full understanding of a utility's rates and bills. This is especially troubling given that, over the next five years, XLI expects Xcel will seek recovery of investments with potential to surpass $1 billion, a more than 40% increase over Xcel's annual revenue requirement, excluding the cost of fuel. *See, e.g.*, *In the Matter of the Petition of Northern States Power Company d/b/a Xcel Energy for Approval of 2021 True-up Mechanisms*, PUC Docket No. E002/M-20-743; *In the Matter of an Inquiry into Utility Investments that May Assist in Minnesota's Economic Recovery from the COVID-19 Pandemic*, PUC Docket No. E,G999/CI-20-492; *In the Matter of a Proposal by Xcel Energy for Authorization to Recover Costs for Investments that May Assist in Minnesota's Economic Recovery from the COVID-19 Pandemic*, PUC Docket E,G002/M-20-716. Indeed, XLI's concerns continue to grow as it receives information from other stakeholders that Xcel may submit yet another set of modeling assumptions in its reply comment. Importantly, XLI understands that Xcel may propose an alternative plan that no longer includes the Sherco CC unit, which is a drastic departure from the existing IRP filings. Xcel appears content to delay informing the Commission and stakeholders of this development, depriving stakeholders the opportunity to provide any feedback on this proposal in reply comments by refusing to answer discovery, while simultaneously maintaining the benefit of that knowledge for itself. *See* Xcel Response to XLI Information Request Nos. 146-147.

[11] Reply Expert Report by J. Kennedy (June 25, 2021) (the "Reply Report").

A. Scenario 15 Appropriately Balances the Important Transition to Renewable Energy with Ratepayer Considerations

XLI urges the Commission to reject Xcel's Preferred Plan in favor of Scenario 15, because Scenario 15 presents a more reliable and affordable transition to renewables. As outlined in the Initial Comment and Report, Xcel's IRP Supplement develops results for 15 baseload scenarios that were compared and contrasted. All 15 of the baseload plans significantly exceed Minnesota's existing goal of a 30% emissions reduction by 2025 and 80% reduction by 2050,[12] and all 15 plans achieve reductions of at least 70% by 2030.[13] Xcel selected one of the two plans that meet its internal corporate goal (80% by 2030) and one of the most capital-intensive plans, Scenario 9, as its Preferred Plan.[14] The characteristics of the Preferred Plan are as follows: (1) retire all coal units by 2030 with seasonal operation prior to retirement; (2) extend operation of Monticello to 2040, with no decision on whether to extend operation of Prairie Island; (3) add around 6,000 MW of new renewable energy over the planning period; (4) add 400 MW of demand response by 2023, and average annual energy efficiency savings of over 780 gigawatt hours; (5) construct a new Sherco CC unit;[15] and (6) add firm peaking resources in the latter years of the plan.[16] Importantly, the Preferred Plan is more expensive than other scenarios, commits Xcel to extensive new capital investments in the face of declining sales and increasing rates for consumers, and forgoes the extension of existing zero-emissions resources. While XLI appreciates Xcel's and the Commission's desire to rapidly reduce carbon emissions, XLI is concerned that Xcel's desired approach will create significant rate increases while simultaneously undermining reliability. XLI suggests that Scenario 15, which extends operation of both the Prairie Island and Monticello nuclear plants by 10 years and maintains (for now) the current retirement dates for Xcel's two

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12 *See* Minn. Stat. § 216H.02.

13 Report at 12.

14 *Id.*

15 XLI generally agrees with the Minnesota Department of Commerce, Division of Energy Resources' ("Department") position that the Commission will determine cost recovery of expenses related to the Sherco CC Unit at a later date; however, in its initial comment, Northern Natural Gas already raises questions related to the cost effectiveness of Sherco CC Unit, questioning Xcel's modeled supply pipeline compared to the use of existing infrastructure owned by Northern Natural Gas. While XLI does not wish to litigate this matter in this docket, XLI notes that, if true, Northern Natural Gas' position supports what appears to be a common theme with Xcel's IRP: implementation of capital-intensive projects that force ratepayers to incur additional expense. *See* Initial Comment by the Department at 43 (Feb. 11, 2021) (eDocket No. 20212-170853-02); Initial Comment by Northern Natural Gas at 2 (Feb. 8, 2021) (eDocket No. 20212-170778-01); *see also* Reply Report at 12 n.27. To be sure, in the event that Xcel no longer seeks to build a Sherco CC, XLI reserves the right to comment on that proposal without committing to a position in this Reply Comment.

16 Report at 12.

remaining coal units, strikes a better balance of cost, reliability, and flexibility considerations while still surpassing the state's carbon emission reductions goals and integrating a significant amount of renewable generation.[17]

XLI accepts that the energy landscape is in the midst of a transition away from carbon-emitting generation to renewable energy, and Scenario 15 does not stray from this goal. As depicted in the Reply Report, Scenario 15 does not materially depart from the Preferred Plan's renewable additions, providing 9,000 MWs of total renewables, which is 82% of the renewable generation contemplated by the Preferred Plan.[18] But, unlike the Company's Preferred Plan, Scenario 15 is the least-cost plan and provides increased flexibility to mitigate potential reliability concerns associated with the transition to renewables.

While the Preferred Plan would prematurely commit Xcel to retirements that could result in severe reliability and cost impacts, Scenario 15 facilitates the transition to renewables by maintaining affordable, reliable, and, in the case of the nuclear units, zero-emissions generation. As noted in the Renewable Integration Impact Assessment ("RIIA") prepared by MISO, incorporating large quantities of renewable generation comes with significant challenges. The RIIA notes that managing MISO at greater than 30% renewable generation requires "transformative thinking" and poses "significant challenges."[19] As high load factor customers, reliability is crucial to XLI members, and the findings of the RIIA demonstrate continued reliability concerns with a high penetration of renewable generation on the system.[20] XLI asserts that Scenario 15 better mitigates these concerns by maintaining reliable and affordable dispatchable resources on Xcel's system.

Rapid implementation of renewable generation will also create both cost and operational challenges that the Commission should consider. As noted in the Reply Report, the MISO

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[17] XLI also notes that selection of Scenario 15 does not preclude Xcel from reaching its internal goal of 80% emissions free by 2030: it simply provides stakeholders and the Commission the opportunity to delay that decision until the next IRP, when XLI fully expects additional technological advancements that may save ratepayers from significant bridge investments in the interim. *See* Reply Report at 12-14. Additionally, maintaining flexibility with respect to the retirement dates for the coal units could allow for additional planning and potential development of battery storage or other resources at those sites to take advantage of existing interconnection and transmission capacity. *See* Reply Report at 12.

[18] Reply Report at 3-4.

[19] RIIA at 4 (Feb. 2021), https://cdn.misoenergy.org/RIIA%20Summary%20Report520051.pdf. *See also* Reply Report at 6-9 for a more in-depth discussion of the reliability considerations of added renewable penetration.

[20] RIIA at 2.

transmission queue remains congested, and the integration of additional renewable generation requires additional transmission upgrades.[21] XLI remains concerned that these costs are not fully accounted for in the modeled interconnection expenses, based on Xcel's confirmation that the modeled interconnection costs do not account for any large regional or inter-regional transmission expansion projects.[22] Further, the time required to construct transmission upgrades on the scale necessary to support a transition to a renewable-heavy generation portfolio has not been considered in the Company's timeline for retiring its existing generation (or is only addressed through the Company's investment of additional capital in new carbon-emitting resources). These cost and reliability concerns are exacerbated by the additional operational challenges that accompany renewable generation in the region, as discussed in the Reply Report.[23] As such, XLI maintains that Scenario 15 is the most prudent plan at this time, because it: (1) is the lowest cost to ratepayers and avoids significant additional capital investments (particularly important in light of declining sales); (2) maintains important dispatchable generation in the face of growing reliability concerns (though this dispatchable generation can now be operated at reduced capacities);[24] (3) does not foreclose Xcel's corporate goal of 80% emissions free by 2030 (and still reaches 70% as is); and (4) promotes operational and regulatory flexibility as the energy sector moves toward a low carbon future. Therefore, XLI requests that the Commission adopt Scenario 15 rather than Xcel's Preferred Plan.

B. Because Xcel's Rates Do Not Comply with Minnesota Energy Policy, Scenario 15 Is the Best Path Forward

When evaluating resource plans, the Commission must consider the resource plan's ability to "keep the customers' bills and the utility's rates as low as practicable, given regulatory and other constraints."[25] Minn. Stat. § 216C.05, subd. 2(4) also makes it "the energy policy of the state of Minnesota that: … retail electricity rates for each customer class be at least five percent below the national average." As outlined in XLI's Initial Comment, the average delivered cost of energy for Xcel's industrial customers was $.0802/kWh in 2019.[26] This rate was roughly 17.8% higher than

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21 Reply Report at 9.
22 *Id.*; *see also* Supplemental Filing by Xcel at 45 (June 30, 2020) (eDocket No. 20206-164371-01).
23 Reply Report at 9-12.
24 *See, e.g.*, *id.* at 7.
25 Minn. R. 7843.0500, subp. 3(B).
26 *See* U.S. Energy Info Admin., 2019 Utility Bundled Retail Sales – Industrial, https://www.eia.gov/electricity/sales_revenue_price/pdf/table8.pdf; *see also* Initial Comment at 2-6.

the national average in 2019 for industrial customers, which was $.0681/kWh.[27] In this proceeding, Xcel reported the data slightly differently, but the result is still that rates were above the national average by more than 11% as of 2019.[28] Regardless, all evidence in this proceeding is that Xcel is currently failing to comply with the policy goal set forth in Minn. Stat. § 216C.05, subd. 2(4). This problem will only be exacerbated by Xcel's Preferred Plan, which will raise electric costs by approximately $3 million for a hypothetical 50 MW customer with an 89% load factor, compared to Scenario 15.[29] On the other hand, all of Xcel's proposed scenarios meet Minnesota's existing regulatory goal of 30% emissions reductions by 2025.[30] On balance, because all of Xcel's proposed scenarios comply with the state's current emissions reductions goals and none appear to reach compliance with the state's energy policy with respect to rates, the Commission should favor a plan that brings Xcel closer to compliance with Minn. Stat. § 216C.05, subd. 2(4). XLI, therefore, urges the Commission to adopt Scenario 15.

Additionally, XLI continues to urge the Commission to require Xcel to conduct a robust analysis of Minn. Stat. § 216C.05, subd. 2(4) (and other regulatory considerations), including rates and bills for each customer class, in its next resource plan. As previously discussed,[31] Xcel is currently engaged in significant resource and cost decisions in other dockets, and, regardless of the outcome in this proceeding, Xcel's rates will likely not comply with the 5% below the national average requirement contained in Minn. Stat. § 216C.05. Due to the multitude of pending dockets and rate increases, XLI asserts that it is becoming increasingly difficult for stakeholders and the Commission to gain a full appreciation for Xcel's current rates.[32] As such, a robust analysis of rates and bills in the next resource plan will provide stakeholders much needed transparency at little burden to Xcel and in furtherance of the mandate contained in Minn. Stat. § 216B.03.

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27 *See* U.S. Energy Info. Admin., 2019 Average Monthly Bill – Industrial, https://www.eia.gov/electricity/sales_revenue_price/pdf/table5_c.pdf; *see also* Initial Comment at 2-6.

28 *Cf.* Xcel Responses to XLI IR 105 (Aug. 28, 2020) (eDocket Nos. 20208-166262-05 & 20208-166262-06); XLI IR 106 (Sept. 1, 2020) (eDocket No. 20208-166325-01); *see also* Initial Comment at 2-6.

29 Reply Report at 14.

30 *See* Minn. Stat. § 216H.02.

31 Initial Comment at 8-9.

32 *Supra* note 10.

III. CONCLUSION

XLI is grateful for the opportunity to submit this reply comment in response to the Notice. XLI understands that this IRP is crucial to Xcel's and Minnesota's energy transition; however, it is important that this process be viewed through a comprehensive lens that accounts for cost, reliability, and flexibility, particularly in light of Xcel's success in meeting current emissions reduction goals. As XLI demonstrates in this reply comment, its Initial Comment, Report, and Reply Report, Xcel's Preferred Plan fails to strike the appropriate balance among these considerations, favoring a capital-intensive plan that reduces flexibility, jeopardizes reliability, and increases rates. Therefore, XLI respectfully urges the Commission to adopt Scenario 15, which better balances the integration of renewable generation and ratepayer concerns. XLI also maintains its request that the Commission order Xcel to include a robust analysis of Minn. Stat. § 216C.05, subd. 2(4), including a rate and bill impact analysis for each customer class, in its next resource plan.

Dated: June 25, 2021

Respectfully submitted,
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ATTORNEYS FOR THE XCEL LARGE INDUSTRIALS

EXHIBIT B

Reply Comments for Xcel Energy's 2020-2034 Integrated Resource Plan Docket No. E002/RP-19-368

Xcel Large Industrials

June 25, 2021

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Introduction

The Xcel Large Industrials ("XLI")[1] submit this reply comment in response to the most recent Notice of Extended Reply Comment Period issued by the Minnesota Public Utilities Commission ("Commission") in PUC Docket No. E-002/RP-19-368 related to Xcel Energy's 2020-2034 Upper Midwest Integrated Resource Plan ("IRP").[2] Though XLI looks forward to the time when renewable energy can reliably and cost-effectively meet the needs of all Minnesotans, the transition to a highly renewable grid is not a simple process. To be successful, utilities, regulators, and stakeholders alike must remain flexible and adaptable in order to effectively respond to the ever-developing technological advances impacting the energy sector. With this need in mind, XLI continues to recommend that the Commission adopt Xcel Energy's Scenario 15 rather than the Company's preferred Scenario 9. XLI supports Scenario 15 because it will still significantly increase the level of renewable resources over what exists today, while also maintaining flexibility, reliability, and affordability.

XLI remains extremely concerned about affordability in light of (1) Xcel's persistent failure to meet the energy policy goal that rates be 5% below the national average contained within Minn. Stat. § 216C.05, subd. 2(4), and (2) declining energy sales, which have resulted and will continue to result in higher energy rates. Comparing Scenarios 9 and 15, our analysis shows that a large industrial customer would save a minimum of $2.9 million from 2022 to 2026 in electricity costs under XLI's preferred portfolio (Scenario 15), and correspondingly, there would be savings to residential and commercial customers, as well. Scenario 15 will provide the Company a better and more affordable platform to manage the transition to renewable resources without materially slowing the pace of carbon emission reductions. While Scenario 9 provides for somewhat more renewable resources, it does so in a manner that increases risk to Xcel Energy's customers, in the way of both reliability and costs. Scenario 15, on the other hand, will still provide for the addition of substantial amounts of renewable resources, while striking a better balance with cost and reliability considerations.

The following table demonstrates the differences in the expansion plans comparing Scenarios 9 and 15 over the 2020 – 2034 planning horizon. The rows shaded in green in Table 1 denote that the same resources are added under both scenarios. Note that Scenario 15 requires the addition of significantly less carbon-emitting fossil peaking resources than Scenario 9 and extends the life of the Prairie Island Nuclear plant, while still adding significant amounts of renewable resources.

[1] XLI is an *ad hoc* consortium of large industrial customers of Northern States Power Company d/b/a Xcel Energy ("Xcel Energy" or the "Company") consisting for purposes of this filing of Flint Hills Resources Pine Bend, LLC; Marathon Petroleum Corporation; and USG Interiors, Inc.

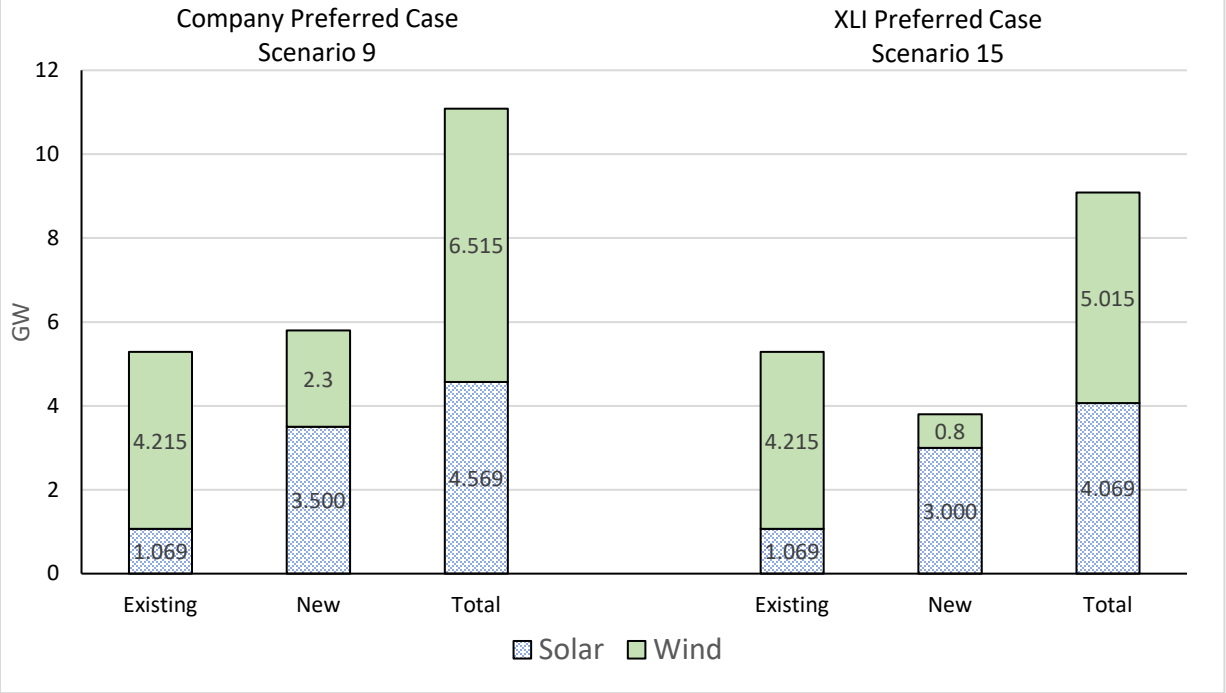
[2] Notice of Extended Reply Comment Period (Mar. 30, 2021) (eDocket No. 20213-172370-01) (extending the reply comment deadline to June 25, 2021).

Table 1

	Scenario 9 - Company Preferred	Scenario 15 - XLI Preferred
Monticello Nuclear	Extend for 10 years	Extend for 10 years
Distributed Solar	Add 0.6 GW	Add 0.6 GW
Energy Efficiency	Add 2 GW	Add 2 GW
Demand Reduction	Add 0.6 GW	Add 0.6 GW
Combined Cycle	Add 0.8 GW	Add 0.8 GW
Prairie Island Nuclear	Retire 2033-2034	Extend for 10 years
Coal Units	Retire by 2030	Retire by 2036
Wind	Add 2.3 GW	Add 0.8 GW
Solar	Add 3.5 GW	Add 3.0 GW
Firm Peaking	Add 2.6 GW	Add 0.7 GW

The following figure identifies the differences in the total amounts of renewable resources that would ultimately be added to Scenario 9 versus 15, over the 2020 – 2034 planning horizon.

Figure 1
Comparison of Renewable Resources
Scenario 9 vs Scenario 15



As discussed further in this report, there are significant transmission issues and intermittency-related operational challenges nearing for the MISO system as other states increase reliance on renewable generating resources. In light of these challenges, system planners and regulators must take a thoughtful approach to address issues such as how quickly to retire coal units, whether to support continued operation of nuclear units, and whether future reliability requirements will be satisfied by mainly adding intermittent resources. Even if significant additions of renewable resources prove capable of satisfying reliability requirements and providing important ancillary services, there are other risks that will have to be addressed, including the risk of exposure to spikes in hourly energy market prices. XLI is concerned that the rising penetration of intermittent resources across the MISO system will lead to what MISO itself notes are "significant challenges" that will require "transformative thinking" to overcome.[3] We believe that the reliability and monetary risks associated with these challenges are being underestimated and would be potentially exacerbated by adopting Xcel's preferred Scenario 9.

As Figure 1 above demonstrates, Scenario 15 still results in a significant amount of renewable resources (82% of the amount in Scenario 9) and would not substantially increase CO_2 emissions.[4] However, it would save already overburdened ratepayers money based on current federal and state environmental regulations. Scenario 15 includes, at a minimum, a 10-year extension of both the Monticello and the Prairie Island nuclear units, which produce a significant amount of carbon-free energy. Also, on top of the already significant amount of wind and solar resources existing on Xcel Energy's system as of 2021 (over 5,000 MW), Scenario 15 would add nearly 4,000 MWs of additional solar and wind resources by 2034. In total, Scenario 15 would result in more than 9,000 MWs of total renewable resources, which is substantial considering the peak demand of the Xcel system is not expected to exceed 11,500 MW over the 2021 to 2034 planning period.

Scenario 15 not only contemplates a more accelerated coal retirement schedule than what Xcel Energy proposed in the last IRP, but it also provides more flexibility than Scenario 9. The retirement date of the coal units could still be advanced if renewable resource costs decline more quickly than currently expected, or federal or state CO_2 regulations are imposed, but only if reliability issues with high levels of penetration of renewable resources can be properly addressed. In other words, no decision needs to be made in this IRP to advance the retirement dates of coal resources any further, though as conditions change, those decisions can still be reconsidered. By waiting just a few years to retire its remaining coal units, and by keeping its nuclear units operating, the Company can: (1) maintain flexibility; (2) be certain that it will have reliable and dependable capacity during these uncertain times; and (3) provide ratepayers the benefit of having more competitive rates, while still meeting all state and federal environmental requirements.

[3] MISO Renewable Integration Impact Assessment, Final Workshop, at 3 (Mar. 3, 2021), https://cdn.misoenergy.org/20210303%20RIIA%20Workshop%20Presentation526540.pdf.

[4] Xcel Energy Upper Midwest Integrated Resource Plan 2020-2034, Supplemental Filing, at 46. *See* Figure 2-17.

Rising Levels of Renewable Penetration Will Bring Challenges

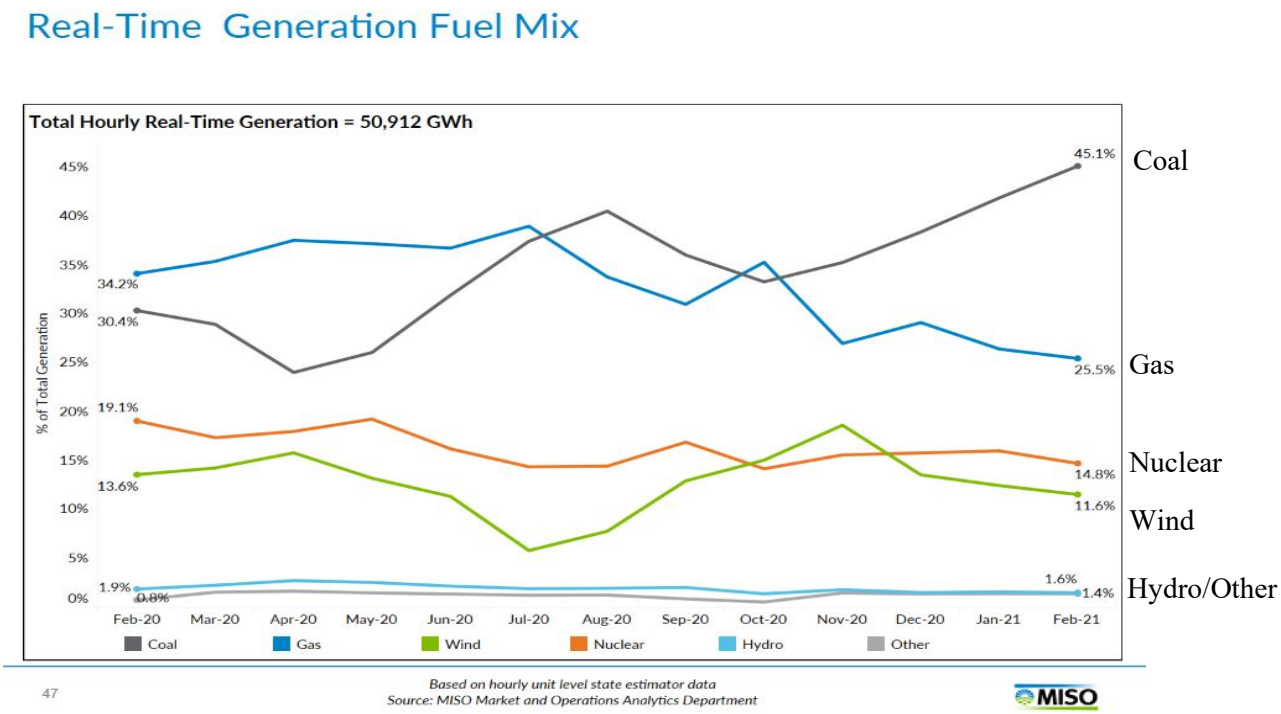
System Reliability Considerations

As mentioned, even in Scenario 15, the penetration of renewable resources will still increase significantly. As substantial amounts of intermittent renewable resources are added, including by other utilities in MISO, there could be times when extreme weather events could cause economic and reliability issues. The Department of Commerce ("DOC") believes reliability may not be a concern and that the focus should be on economic risk, which the DOC believes could arise from being a net importer from MISO.[5] In order to avoid reliability issues, most likely utilities in MISO would have to continue operating dispatchable resources, and add substantial transmission upgrades. Even if these steps were taken to ensure that reliability is not compromised, economic pressures could still arise due to unhedged exposure to spot market prices resulting in high costs, particularly at times of high demand and limited availability of renewable generation. Both economic and reliability risks are of concern for XLI, and presumably for all ratepayers.

The February 2021 winter weather event provides a noteworthy example to consider. Although the largest of the reported problems were associated with Texas, the day-ahead and real-time system-wide average monthly prices for MISO in February shot up from below $24/MWh the month before to $68/MWh and $61/MWh, respectively and in some hours as high as $3,500/MWh.[6] As shown in the MISO Real-Time Generation Fuel Mix chart below,[7] coal generation increased 48% in February 2021 during the winter event compared to February 2020. Also, coal generation increased dramatically from January 2021 to February 2021, in response to that event.

[5] DOC Comments at 34.
[6] MISO Informational Forum at 17, 20 (Mar. 2021), https://cdn.misoenergy.org/202103%20Informational%20Forum%20Presentation538212.pdf.
[7] *Id*. at 47.

Figure 2



Coal is a dependable generation resource that provided significant value to MISO during the February extreme weather event. The Company does not need to rush to decide now to advance the retirement dates of all of its coal units before it is fully known to what extent renewable resources can be relied on for reliability during these extreme weather events. XLI does not suggest that the Company should continue running its coal plants indefinitely. Rather, the coal unit retirement date decisions as proposed in the Preferred Plan are premature, and could eliminate the benefits those units may provide in facilitating the transition to a cleaner, more renewable grid. Given what is currently known and recent operational realities (as noted in Figure 2 above), it would be prudent to hold off on the decision to advance the coal unit retirement dates and consider them in a future IRP, after gaining more clarity about how useful these plants will be over the next few years as MISO makes adjustments to its grid to accommodate renewables above a 30% penetration level.

Furthermore, last year the Commission authorized the Company to seasonally operate and economically commit some of its coal units. The Company noted that this operation would still allow the units to be available "to meet reliability needs,"[8] and the Commission found that this would allow the Company to achieve "a meaningful reduction in carbon output while reducing ratepayer costs."[9] The Commission was wise in allowing the Company to ensure these units would be available to continue satisfying reliability needs while being able to reduce CO_2 emissions as the system transitions to more renewable resources. Similarly, Scenario 15 allows for extending

8 Commission Order Approving Plan in Docket No. E-002/M-19-809, July 15, 2020, at 2 (July 15, 2020).
9 *Id*. at 3.

the operating lives of the nuclear units, which can provide affordable, reliable, and carbon-free energy to support the transition to renewables.

According to MISO's recent Renewable Integration Impact Assessment ("RIIA"), as of March 2021, the MISO system currently includes a renewable resource penetration level of 13% and an additional 16,000 MW of renewable capacity is queued to come online in the next few years, which will result in 20% penetration once connected. The report indicates that MISO could reach 30% penetration of renewables by 2026.[10] The report found that the complexity of integrating renewables increases sharply beyond the 30% penetration level, making the 30% threshold an inflection point for MISO's system. The report also found that any greater level of renewable resources will require "transformative thinking" and substantial grid investments beyond current operating, market, and planning practices.[11]

MISO's RIIA report identifies risks that must be managed with rising renewable penetration, including risks to grid stability, shifting periods of grid stress, shifting energy shortage risks, flexibility risks, and insufficient transmission infrastructure. To incorporate renewable resources, MISO will need to build more transmission facilities (especially high- and extra-high-voltage transmission lines), add more STATCOMS and Synchronous Condensers (both used for reactive power control), make adjustments to dispatch decision-making, and manage increasingly challenging small signal stability and frequency response issues.[12] These needs will require significant investments and were not included in the modeling performed by the Company or other intervenors.

The DOC notes there could be reliability problems caused by high levels of renewables as it stated in its initial comments:

> [I]nsufficient dispatchable capacity on MISO's system as a whole during low wind/solar output hours could be a reliability issue as it might result in a situation where insufficient capacity was available to MISO to dispatch in order to meet load. This is a system-wide reliability issue. A regional reliability issue could occur if Xcel Energy's shortfall exceeded the region's import capability available from the rest of MISO (via the transmission system) and Xcel Energy did not have sufficient firm capacity available to make-up for that shortfall.[13]

In other words, it could be problematic if there are significant increases in renewable resources in MISO and there is insufficient import capacity, particularly at times when the wind does not blow, or the sun does not shine over a wide region within MISO. This is especially important given the DOC's modeling results that demonstrated that fewer renewable resources were added when

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10 MISO Renewable Integration Impact Assessment (RIIA) at 5 (Feb. 2021), https://cdn.misoenergy.org/RIIA%20Summary%20Report520051.pdf ("RIIA Report").

11 *Id.* at 4.

12 *Id.* at 8-9.

13 Department of Commerce Initial Comments at 35.

MISO imports were restricted.[14] Xcel Energy's current plan relies on being able to import energy from MISO as needed; however, unless significant expansion occurs within MISO (how that will play out is unknown at this point), there could be reliability issues and constraints on energy imports.

Transmission Bottleneck

The DOC's discussion on page 43 of its initial comments indicates that congestion has been rising in Minnesota since 2020.[15] Especially given the trend of more renewables being added across MISO, there will be a need for an expansion of transmission throughout the MISO system.[16] The Sierra Club agrees that Xcel Energy in particular should "move[] quickly to address transmission bottlenecks," as "Xcel and Minnesota's other utilities are already behind the ball on planning for new transmission."[17] We agree that these upgrades may be necessary, as expanding transmission infrastructure will allow more renewables to be added reliably to the MISO system, facilitating inter-regional transfers of energy from windy and sunny areas to other areas of the MISO system. However, these costs do not fully account for the coordinated transmission expansion that will be necessary in the MISO West region.[18]

Monetary considerations aside, large-scale transmission projects are inevitably complex, time-consuming, and prone to delays. PacifiCorp, which is a utility similar to Xcel Energy that spans a multi-state region of the west, has been trying to expand its transmission system since 2007 based on its "Energy Gateway" transmission project.[19] That project was conceived to allow PacifiCorp to be able to tap into both renewable solar and wind opportunities that are abundant in different parts of its system and transmit that energy great distances to the population centers within its system. However, over the many years that the project has been on the drawing board and under construction, there have been considerable delays caused by siting issues, environmental compliance problems, construction shortages, weather delays, and cost recovery issues that involve multiple state jurisdictions. As such, the lesson of the PacifiCorp example is that if the Company has to rely on transmission upgrades to be able to expand renewable resources, it should leave itself plenty of time and room to maneuver to ensure successful completion of the upgrades. The additional firm generation capacity and flexibility afforded by Scenario 15 may prove invaluable during this period of preparing for greater levels of renewable penetration.

Operational Challenges

Today, 80% of MISO's renewable generation is concentrated in the northwest region, with North Dakota wind making up a large portion of this energy.[20] A high degree of geographic

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14 *Id*. at 62.
15 *Id*. at 43.
16 RIIA Report at 13.
17 Sierra Club Comments at 19.
18 Xcel Energy's 2020-2034 Upper Midwest IRP, Supplemental Filing, at 45.
19 Utility Dive, Can Warren Buffet's PacifiCorp Bring the Northwest's Renewable Riches to Market (Sept. 15, 2014), https://www.utilitydive.com/news/can-warren-buffetts-pacificorp-bring-the-northwests-renewable-riches-to-m/308875/.
20 RIIA Report at 5.

concentration introduces complications that will adversely impact MISO's ability to maintain stable operations in all conditions. When the wind inevitably slows down in the region that produces the majority of the wind energy, the MISO system loses a significant portion of its generation at the same time (referred to as correlated generation). Just recently in April 2021, MISO encountered a situation in which, because of a lack of wind and the need to quickly ramp up resources, a system-wide spike in market prices to $3,500/MWh occurred for a short period of time. As more renewable resources are added to the system, these intermittent resources will become increasingly relied upon to serve load. The Company's plan to add more renewables in northwest Minnesota could exacerbate this issue of correlated generation.

Sierra Club notes in its initial comments that the solution to problems of conventional generator-correlated outages and of the need to curtail renewable resources is transmission,[21] which, as we have previously noted, will likely be an expensive, complex, and time-consuming process that will likely involve unexpected hurdles. Again, by delaying the retirement of some coal plants and extending the operation of the nuclear units in Scenario 15, Xcel Energy will have the flexibility to generate affordable, dispatchable energy as MISO approves the construction of more transmission.

The addition of solar resources, which are increasing across the country, will likewise present additional challenges as weather influences, such as cloud cover, can create big swings in solar generation. For instance, in a recent IRP, Duke Energy Progress presented graphs of daily solar generation in its service territory in the Carolinas. The company's actual solar generation peaked at about 1,500 MW one day in February 2021 and peaked at only around 300 MW another day in the same week because of cloud cover.[22] The amount of generation expected is important for scheduling dispatchable resources, but it can be difficult to forecast even on a day-ahead basis, particularly if partly cloudy or overcast conditions are expected.[23] This can cause challenges for grid operators balancing generation to load. Unexpected cloud cover was mentioned in the root cause analysis as a contributing factor of the blackouts in California in August 2020.[24]

Cloud cover can also be an issue within MISO. The figures below compare the 2020 cloud cover in Minneapolis to Las Vegas.[25] Note that in a desert climate, forecasting solar generation is a

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[21] Sierra Club Comments at 92.

[22] Rebuttal Testimony of Dewey S. Roberts for Duke Energy Progress in SC 2019-224-E, Duke Energy Progress' 2020 IRP Report at 19, Figure 2 (Mar. 19, 2021), https://dms.psc.sc.gov/Attachments/Matter/6a3f70b1-1aff-45a1-b673-8ffbdbbacca4; *see also id.* at Figures 3, 5, 6, 7.

[23] Climate change may also impact solar generation via increased rainy and snowy days. As noted by the Minnesota Pollution Control Agency, "[b]etween 1951 and 2012, total precipitation amounts increased by over 20% (5.5 inches) in the Twin Cities. Increasing rainfall in the spring and autumn months accounted for most of that increase…. Looking into the future, most climate models show at least a slight increase in projected annual precipitation across the state." Minn. Pollution Control Agency, https://www.pca.state.mn.us/air/effects-climate-change-minnesota (last visited June 21, 2021).

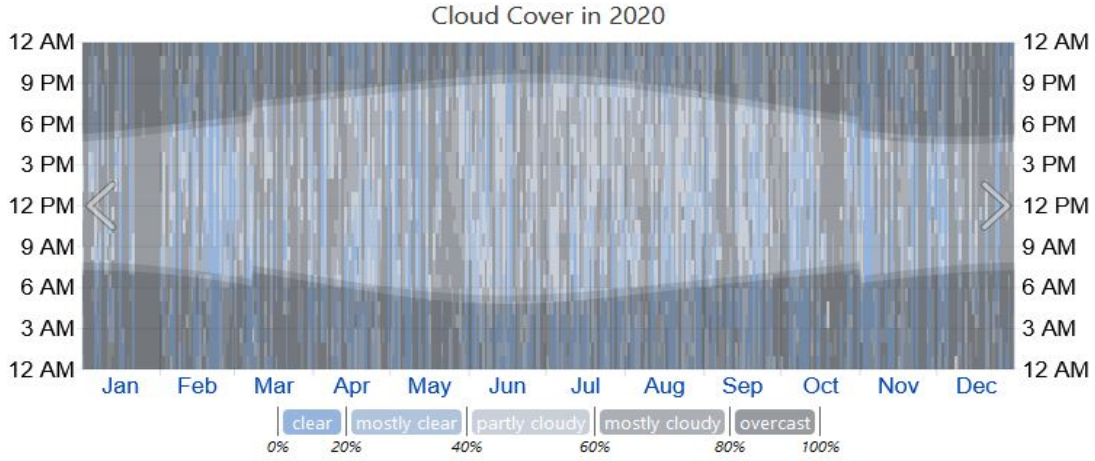
[24] CAISO, Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave, at 50 (Jan. 13, 2021), http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf.

[25] Actual 2020 cloud cover from Minneapolis and Las Vegas Airports, via WeatherSpark.com. WeatherSpark.com, https://weatherspark.com/h/y/146218/2020/Historical-Weather-during-2020-at-Minneapolis-St-Paul-International-Wold-Chamberlain-Airport-Minnesota-United-States;

much simpler task than in a climate like Minnesota's, which receives a lot of intermittent cloud cover throughout the year. This cloud cover not only limits solar productivity but also makes operational planning and maintaining reliability more difficult than in other regions, as the output from solar units cannot be counted on days or weeks in advance. In some situations, grid operators may not know how much power to expect even hours beforehand.

Figure 3

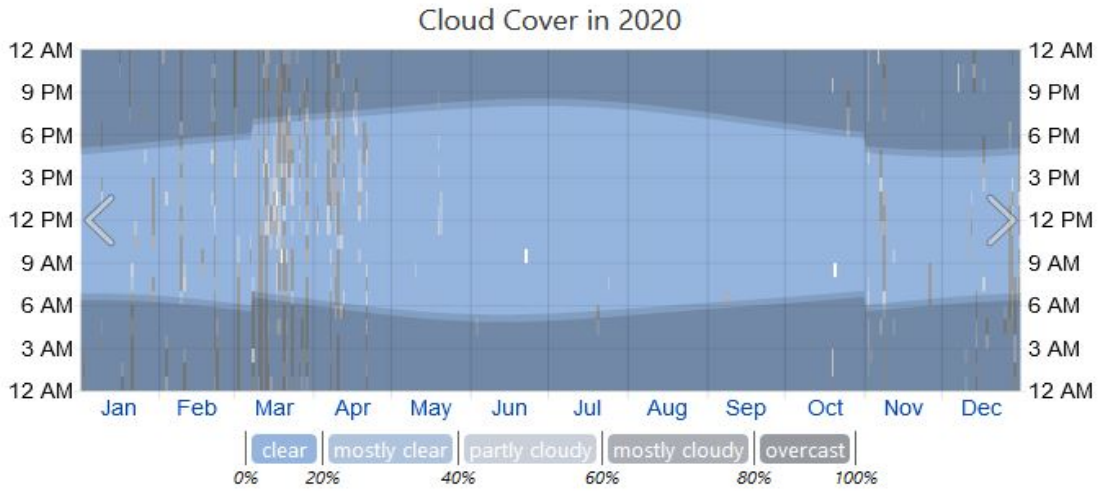
Minneapolis Cloud Cover 2020



The hourly reported cloud coverage, categorized by the percentage of the sky covered by clouds.

Figure 4

Las Vegas Cloud Cover



The hourly reported cloud coverage, categorized by the percentage of the sky covered by clouds.

https://weatherspark.com/h/y/145434/2020/Historical-Weather-during-2020-at-North-Las-Vegas-Air-Terminal-Nevada-United-States (last visited June 21, 2021).

The Company acknowledges that "geographic diversity is shown to reduce the impact of localized weather events, but the scale of geographic diversity needed to assess mitigation of dispatchability requirements has not been explored by the Company."[26] We agree with the Company that geographic diversity is necessary for maintaining reliability as increasing levels of renewables are added to the grid. Accordingly, it would be prudent to delay retiring firm, dispatchable generation until the degree of these challenges is fully understood and a plan for addressing these challenges is underway.

Maintaining Flexibility Is the Most Prudent Course of Action

With higher penetrations of renewables, existing coal and nuclear capacity may provide reliability benefits as affordable, dispatchable resources that can handle unforeseen weather-related issues. As mentioned, no decision needs to be made in this IRP to advance the retirement dates of the remaining coal units. Because of the addition of more renewable generation, the existing coal plants will be needed less frequently, thus minimizing their emissions. At the same time, coal can provide cost-effective diversification should gas availability become limited. The DOC notes that "all of Xcel's plants ultimately draw their natural gas supplies using the same interstate pipeline—Northern Natural Gas (NNG). This is a risk which cannot be mitigated at this time."[27] But waiting to retire the coal units would give the Company a commonsense way to alleviate risks in gas pipeline delivery. The Sierra Club also noted that the Company "fails to account for the risk of conventional generator correlated outages,"[28] that is, when one gas generator fails others nearby are likely to fail at the same time. XLI recognizes that these may be low probability events; nevertheless, the solution to both of these risks is diversification: existing coal-fired generation and the extension of nuclear resources can be used to bridge the gap and reduce risks while issues associated with gas supply and other issues related to renewable resource intermittency are addressed. Delaying a decision on the coal units could also provide the opportunity for technological advancements and cost reductions to occur that could create the opportunity for adding even more carbon-free resources to the system, including renewable and battery storage resources. Further efficiencies could be achieved by adding the renewable and battery storage resources at the site of retired coal and peaking units, which would allow the existing transmission system to be used without having to add significant and costly upgrades.

Besides coal generation, Scenario 15 would preserve both of the Company's existing nuclear generating plants, keeping low-cost, carbon-free baseload generation online in the transition to a

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[26] Xcel Energy Response to XLI Information Request No. 132 (eDocket No. 20213-172100-06).

[27] DOC Initial Comments at 27. Xcel is in the process of considering the gas pipeline connection for the Sherco CC project. The choice is between building a 135-mile pipeline interconnected to Northern Border Pipeline Company (a new supplier) and constructing a less than 17-mile pipeline interconnected to Northern Natural Gas (which supplies all of the Company's existing gas fuel). Northern Natural Gas has stated that "it would guarantee to be Xcel's least cost transportation service option." Northern Natural Gas Comments at 2. The Company explained in its Response to IR No. 127 that it is engaged in a confidential competitive process to select the natural gas transportation project that will provide the best balance of low cost and service flexibility to customers. Since this evaluation is currently ongoing, it may be too early to draw conclusions. However, XLI reserves the right to address this issue in a future proceeding.

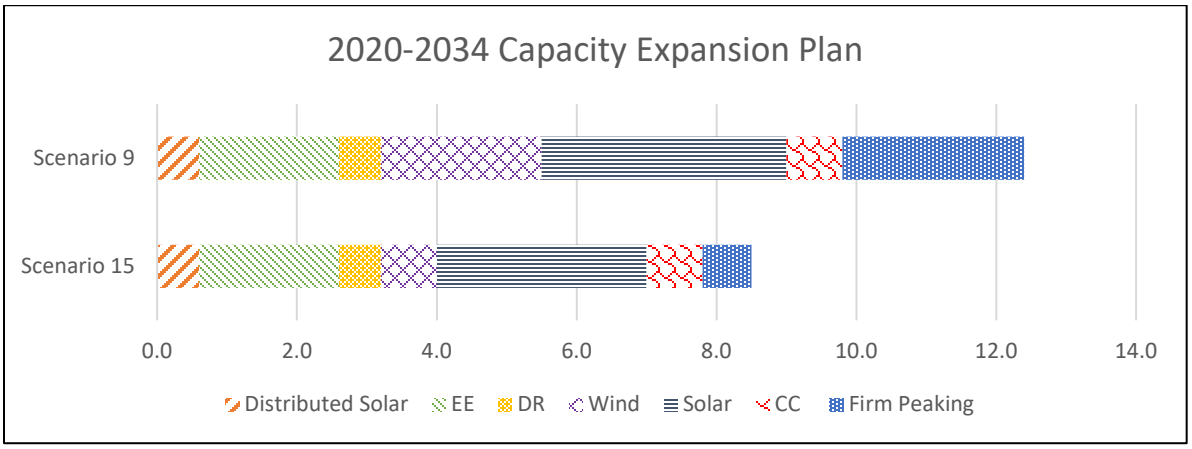
[28] Sierra Club Initial Comments at 92.

decarbonized electric system. The Company's Preferred Plan only includes the extension of the Monticello unit; it does not include the extension of the Prairie Island plant. This would be a loss for both reliability and affordability. By way of example, Exelon's CEO recently said that keeping its Illinois nuclear plants running would be 12 times less expensive than replacing them with comparable levels of renewables and storage resources.[29] The intermittent nature of the renewable energy being added to the grid makes the carbon-free baseload power supplied by the Company's nuclear units a vital piece of the highly renewable grid.

The flexibility gained in Scenario 15 does not come at the expense of meeting Minnesota's environmental goals. All of Xcel Energy's proposed portfolios will exceed Minnesota's CO_2 emission reduction requirements ahead of the deadline.[30] Both Scenarios 9 and 15 achieve a substantially similar amount of carbon reductions by 2030 – a 75% reduction from 2005 levels by 2030 for Scenario 15 versus an 81% reduction for Scenario 9.[31] Scenario 15 is well on its way to meet Minnesota's 80% statewide CO_2 reduction requirement by 2050. Even if it were desirable for the Company to meet its corporate goal of an 80% reduction in CO_2 by 2030, the Company could still meet that emissions reduction goal by deciding in the next IRP to accelerate its coal unit retirement plans. This additional time would allow the Company as well as MISO to investigate further the reliability impacts of significant levels of intermittent renewable resources on the MISO system, monitor the pace at which renewable resource costs continue to decline, and consider future developments in federal and state CO_2 legislation.

The following figure demonstrates the differences in the expansion plans comparing Scenarios 9 and 15.

Figure 5



[29] Utility Dive, Exelon CEO: Replacing Nuclear with Renewables, Storage to Meet Carbon Goals Could Cost Illinois $80B (May 6, 2021), https://www.utilitydive.com/news/exelon-ceo-replacing-nuclear-with-renewables-storage-to-meet-carbon-goals/599650/.

[30] XLI Comments, Exhibit A, at 15. *See* Figure 5.

[31] Xcel Energy Upper Midwest Integrated Resource Plan 2020-2034, Supplemental Filing, at 46. *See* Figure 2-17.

Finally, affordability is a concern that must be addressed. As discussed in our initial comments, Xcel Energy customer rates are higher than state and national averages, and are significantly higher for the industrial class.[32] XLI performed an analysis of a hypothetical 50 MW industrial customer with an 89% load factor and found that adopting Scenario 15 over Scenario 9 would save this customer approximately $3 million in electricity costs from 2022 to 2026. It is important to note that this figure represents a *minimum* savings, as it does not consider the additional costs that will have to be accounted for given the greater penetration of renewable resources included in the Company's Preferred Portfolio. These costs include additional transmission related expenses and market-related reliability costs. This rate impact is not inconsequential and should be front and center in the Commission's considerations in light of Xcel's current noncompliance with explicit state energy policy requiring that rates for each customer class be 5% below the national average.[33]

While Xcel Energy is ahead of expectations with regard to CO_2 emission reductions, it is failing to provide a plan that will lead to the low-cost service expected by the clear policy mandate contained within Minn. Stat. § 216C.05, which sets a goal that rates should be at least 5% below the national average on a rate class basis. In other words, the Company gives all weight in its consideration to the environmental policy goals in Minn. Stat. § 216C.05, subd. 2(1) – (3), and places no weight in its consideration to the average rate issue in Minn. Stat. § 216C.05, subd. 2(4). Scenario 15 provides an opportunity for the Company to be in a better position to provide low-cost, reliable power in the coming decades by prioritizing flexibility and affordability. It would maintain a more diverse set of dispatchable firm generation while the industry expands the transmission system, enhancing reliability both presently and in the coming decades. It would commit to extending existing nuclear generation to provide carbon-free baseload power, and potentially avoid the need for constructing new carbon-emitting generation. It would do all this at a lower cost than the Company's Preferred Plan, without substantially increasing emissions or slowing the adoption of renewable generation to the grid. In other words, adopting Scenario 15 as the preferred plan would be the first step to assigning at least some weight to Minn. Stat. § 216C.05, subd. 2(4).

Conclusion

All of the scenarios Xcel Energy evaluated meet the state's CO_2 requirements; indeed, each of the scenarios goes well beyond the state's reduction targets and does so on a timeline well ahead of schedule. However, as XLI pointed out in its first set of comments, Xcel Energy's rates for industrial customers are well above both state and national averages. On top of these already high rates, a typical large industrial customer would have to pay at least $2.9 million in additional energy costs over five years under the Company's preferred plan (Scenario 9) compared to XLI's recommended plan (Scenario 15). Considering the fact that the Company has failed to provide affordable electricity rates as mandated, the Commission would be wise to prioritize flexibility and cost-effectiveness in this proceeding.

[32] XLI Comments, Exhibit A, at 3-4. *See* Figure 1.
[33] Minn. Stat. § 216C.05, subd. 2(4).

Xcel Energy should wait to lock in the retirement dates of its coal-fired units until at least the next IRP and plan on extending the lives of its nuclear plants. It should study using these existing nuclear and coal-fired units as cost-effective generation that may avoid the need for new resources and provide the Company additional flexibility in navigating the complexities of the coming energy transition.

We believe Scenario 15 enables the Company to make the transition to carbon-free resources better than the Company's Preferred Plan because it commits to extending important nuclear resources and maintains the dispatchable generation necessary to serve load reliably in all weather conditions while transmission and operational challenges are addressed. We recommend that the Commission direct Xcel to implement Scenario 15 to better balance system needs, technological advancements, and customer considerations going forward.