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STATE OF MINNESOTA

BEFORE THE PUBLIC UTILITIES COMMISSION

In the Matter of Xcel Energy's 2019-2034 Upper Midwest Resource Plan	**PUC Docket No. E002/RP-19-368**

CLEAN ENERGY ORGANIZATIONS' REPLY COMMENTS

On Behalf Of
Fresh Energy
Clean Grid Alliance
Union of Concerned Scientists
Minnesota Center for Environmental Advocacy

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INTRODUCTION

Decarbonizing the power sector is the first and most pivotal step toward meaningfully addressing the climate crisis. The most recent scientific studies describe a narrow, but achievable pathway for limiting global warming to 1.5º C and avoiding the most catastrophic effects of climate change – a pathway that provides no room for the building of new Combined Cycle natural gas plants. Fortunately, Minnesota's integrated resource planning ("IRP") process allows Xcel, the Commission, and interested stakeholders like Clean Energy Organizations ("CEOs") to develop a plan that is in the public's best interest. CEOs appreciate Xcel's efforts to decarbonize while still providing reliable energy to Minnesotans. But, CEOs have demonstrated that Xcel can do better.

Xcel's plan has a fatal flaw: the proposed combined cycle gas plant ("Sherco CC"). Xcel failed to comply with the renewable energy preference which requires Xcel to explore whether a renewable energy alternative to the Sherco CC would be in the public's best interest. Because Xcel's modeling treats the Sherco CC as necessary rather than exploring whether it is *actually* necessary, the IRP does not present the full picture. Consequently, Xcel failed to present a record on which the Commission could determine whether the Sherco CC is in the public interest.

Fortunately, other parties have presented ample evidence and data to inform the Commission's decision. Electric system modeling analysis by CEOs, Sierra Club, the Citizens Utility Board, and others share a common finding: The Sherco CC is unnecessary for reliability, bad for ratepayers, and more expensive than renewable options. Further bolstering this point, the Department of Commerce's modeling also shows that the Sherco CC is more expensive than a plan that excludes the new gas plant. The Commission does not have to choose between saving ratepayer money and pursuing a clean energy future. Approving a resource plan without the Sherco CC does both.

Finally, eliminating the Sherco CC would respond to the important new realities that have emerged since the IRP was originally filed, including the growing urgency of the climate crisis and the broad consensus around the need to accelerate our pace of decarbonization. Recent developments in both policy and science have made clear the greatly increased risk of building a large new source of carbon emissions. Replacing the Sherco CC with renewable options would put Xcel and Minnesota on a pathway that is safer for the climate and safer for Xcel and its customers.

I. THE COMMISSION SHOULD FIND THAT INCLUDING THE SHERCO CC UNIT IN XCEL'S RESOURCE PLAN IS NOT IN THE PUBLIC INTEREST

A. The Department Correctly Asserts That If Xcel Eventually Builds And Seeks Cost Recovery For The Sherco CC, Xcel Must Prove The Prudence Of Investing In The Sherco CC Unit, Despite The 2017 Legislation, And That Xcel Has Not Even Attempted To Do So In This IRP.

The Department states that the 2017 legislation addressing the Sherco CC unit[1] ("2017 Legislation") maintains the Commission's standard authority regarding rate recovery, and that this imposes risks on Xcel because it can only recover in its rates what the 2017 Legislation refers to as the unit's "reasonable and prudently incurred costs and investments."[2] On this point the CEOs and the Department agree.[3] The 2017 Legislation is in no way a blank check automatically allowing rate recovery for the Sherco CC unit. For Xcel to charge ratepayers for the cost of the Sherco CC unit, the Company will eventually have to establish that the time and money spent building it were reasonable and prudent.

[1] Laws of Minnesota 2017, chapter 5 – H.F. No. 113, section 1.
[2] Dep't of Commerce Initial Comments, *In the Matter of Xcel Energy's 2019-2034 Upper Midwest Integrated Resource Plan*, Docket No. E002/RP-19-368, 45 (Feb. 11, 2021) [hereinafter "DOC Initial Comments"].
[3] Clean Energy Orgs. Initial Comments, *In the Matter of Xcel Energy's 2019-2034 Upper Midwest Integrated Resource Plan*, Docket No. E002/RP-19-368, 6 (Feb. 11, 2021) [hereinafter "CEO Initial Comments"].

Xcel does not appear to dispute this. As the Department notes, Xcel has not made any effort in this proceeding to establish the investment prudence of this plant. It has not even provided final cost estimates for the plant or the associated pipeline, as required by the 2017 Legislation. The Department therefore recommends that the Commission "not make a determination regarding reasonable and prudently incurred costs in this proceeding."[4] CEOs agree that future Sherco CC costs have not been shown to be reasonable and prudent upon this record.

However, the same logic that the Department applies to the costs of the Sherco CC equally applies to the threshold question of whether the Sherco CC is in the public interest compared to a renewable alternative. Xcel has not merely declined to establish a reasonable and prudent level of costs for the Sherco CC. Xcel has also declined to try to demonstrate that the Sherco CC is preferable over renewables. Its failure to allow its model to compare the Sherco CC to renewable alternatives is a fundamental flaw in Xcel's plan. The Commission cannot approve a nonrenewable facility like the Sherco CC in an IRP (or allow rate recovery) unless the utility "has demonstrated that a renewable energy facility is not in the public interest."[5] Xcel's decision not to attempt to make that demonstration in its modeling, and its failure to examine the Sherco CC in its modeling in any way, means there is no basis on which the Commission can find that a plan containing the Sherco CC is in the public interest under Minn. Stat. § 216B.2422, subd. 4. For these reasons, nothing in the Commission's order can constitute prima facie evidence on that point pursuant to Minn. R. 7843.0600, subp. 2. in a future rate case.

[4] DOC Initial Comments at 45.
[5] Minn. Stat. § 216B.2422, subd. 4.

B. CEOs Disagree With The Department's Position That The 2017 Legislation Means The Sherco CC Unit Need Not Be Assessed In This IRP Process.

CEOs disagree with the Department's view that the Commission need not assess in this docket whether building the Sherco CC unit is in the public interest under the IRP statute. Under Minn. Stat. § 216B.2422, subd. 2, the Commission "shall approve, reject, or modify the plan … consistent with the public interest," and the Sherco CC unit is an important part of Xcel's plan.

1. The Commission has the authority and responsibility under the IRP law to reject or modify utility plans that are not in the public interest.

The Department asserts, without explanation, that since Xcel is allowed to bypass the Certificate of Need provisions of Minn. Stat. § 216B.243, it is "appropriate to treat the Sherco CC unit as an approved project in this proceeding," and the unit can be "locked into" the IRP modeling rather than letting the model compare it to other options and select or reject it accordingly.[6] CEOs disagree.

The legislature explicitly exempted the Sherco CC unit from the requirements of Minn. Stat. § 216B.243 and from the site permit requirements of § 215E, but it chose not to exempt the unit from the requirements of the IRP statute. The Commission is therefore still required by Minn. Stat. § 216B.2422, subd. 2(a), to approve, reject, or modify a utility's IRP "consistent with the public interest." Thus, whether Xcel's continued pursuit of a costly, long-lived fossil-fuel power plant is in the public interest is a critical question before the Commission in this IRP.

Despite the Department's view that the Commission need not assess the Sherco CC as part of Xcel's resource plan, the Department does acknowledge that using the modeling exercise to actually assess the Sherco CC unit, rather than simply locking it in and sheltering it from analysis, "can have resource planning value."[7] The Department's modeling provided in initial comments

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[6] DOC Initial Comments at 44.
[7] DOC Initial Comments at 45.

does helpfully include one run *without* the Sherco CC. This run is a sensitivity comparing the Department's preferred plan with and without the Sherco CC.[8] The plan without the Sherco CC is less expensive than the Department's preferred plan with the Sherco CC on a PVSC basis.[9] Moreover, the plan without the Sherco CC is less expensive than the same plan with the Sherco CC across each of the many sensitivities the Department analyzed.[10] Therefore, the Department's limited modeling examining the cost-effectiveness of the Sherco CC is consistent with the CEOs' and other parties' modeling analyses that the Sherco CC is not an economic resource.

2. The Commission's public interest assessment should reflect the impact of changed circumstances on the Sherco CC.

The Department asks in its comments, "when is a determination regarding reasonable and prudently incurred costs made?", and notes that it is standard for that determination to be made after a unit is put in service and cost recovery is requested in a rate case.[11] But the fact that the Commission would have an opportunity to judge the prudence of the Sherco CC unit in a future rate case is no substitute for exercising its authority to assess whether the power plant is in the public interest under the IRP laws and rules in this docket. The resource planning process gives the Commission an invaluable opportunity to address changed circumstances earlier in the process, promoting the public interest by avoiding unnecessary expenditures that would take place before the future rate case.

However, there is clearly a relationship between a forward-looking finding that a power plant investment is in the public interest and an after-the-fact finding that it was prudent. In other

[8] DOC Initial Comments, Attach. 3 at 1 (Scenario 134a).
[9] *Compare* DOC Initial Comments, Attach. 3 at 1 (Scenario 134a) *with* DOC Initial Comments, Attach. 1 at 34 (Scenario 134).
[10] *Id*. *See also* EFG Supplemental Report (Attachment 2), Section 3, for discussion of DOC's Sherco CC modeling.
[11] DOC Initial Comments at 45.

words, the Commission's decision in this docket could be brought forward as evidence of prudence in a future rate case.[12] Therefore, the principles the Commission has applied when assessing the prudence of past power plant investments in rate cases should help inform how it assesses the public interest of proposed power plant investments in IRP dockets. Among the principles firmly established in the Commission's rate cases is that even if it is prudent to *initiate* a power plant project (and even if the project has been formally approved in advance), it is not necessarily prudent to *continue* investing in it year after year. Whether ongoing investment is prudent must be judged based on the conditions at the time those ongoing investments are made, and changing circumstances frequently make it prudent to cancel or withdraw from the project. The decision to initiate a project and the decision to continue it are effectively different decisions to be judged separately based on then-current circumstances.

For example, in three cases where utilities sought recovery of expenditures for cancelled projects, the Commission investigated the prudence of both the initial decision to pursue the project and the subsequent decision to withdraw from it. In all three cases – regarding the Big Stone II coal unit,[13] the Sutherland IV coal unit,[14] and the Prairie Island uprate[15] – the project had received

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[12] Minn. R. 7843.0600, subp. 2.

[13] Minn. Pub. Utils. Comm'n, *In the Matter of the Application of Otter Tail Power Company for Authority to Increase Rates for Electric Utility Service in Minnesota*, Findings of Fact, Conclusions, and Order, Docket No. E-017/GR-10-239 (Apr. 25, 2011) [hereinafter "Big Stone II Order"].

[14] Minn. Pub. Utils. Comm'n, *In the Matter of the Application of Interstate Power and Light Company for Authority to Increase Rates for Electric Service in Minnesota*, Findings of Fact, Conclusions, and Order, Docket No. E-001/GR-10-276, 33 (Aug. 12, 2011) [hereinafter "Sutherland IV Order"].

[15] Minn. Pub. Utils. Comm'n, *In the Matter of the Application of Northern States Power Company for Authority to Increase Rates for Electric Service in the State of Minnesota*, Findings of Fact, Conclusions, and Order, Docket No. E-002/GR-13-868 (May 8, 2015) [hereinafter "Prairie Island Order"].

advance approval from regulators, yet changes in the regulatory and economic landscape later undermined the wisdom of the project.

The Commission found in all three cases that the utilities had prudently initiated the projects and, after circumstances changed, they had prudently withdrawn from them. The Commission allowed the utilities to amortize these costs, repeating virtually the same language in each case to explain that disallowing costs prudently incurred in good faith could potentially chill a utility's "diligence in developing resources and in promptly withdrawing from projects when experience shows that they will no longer serve ratepayers' best interests."[16] In the case of Xcel's withdrawal from the planned Prairie Island uprate, on which it had already spent $79 million, the Commission praised the Company's timely response to "new realities" and "changed circumstances," indicating that it might be different if Xcel had "fail[ed] to recognize, react to, and disclose signs of trouble as they developed."[17]

The Commission has demonstrated the importance of acknowledging and responding to changed circumstances even after significant investments have been made. However, it is clearly better for all concerned to forestall unwise power plant investments rather than to waste customer dollars or punish utilities later by denying rate recovery. Indeed, this is one of the reasons the integrated resource laws were adopted. In its 1990 Statement of Need and Reasonableness ("SONAR") supporting adoption of its IRP rule, the Commission specifically cited "[p]lanning errors across the United States [that] have translated into billions of dollars of plant disallowances

[16] Big Stone II Order, 11; Sutherland IV Order, 33; Prairie Island Order, 33 (emphasis added).
[17] Prairie Island Order, 32.

and/or rate increases."[18] It was referring to the ill-fated rush of utilities to build nuclear and coal plants in the 1970s.[19]

Changing circumstances between the early 1970s and the 1980s led to the cancellation of 97 nuclear plants and 75 coal plants by 1986, often after construction was well underway; sunk costs for the cancelled nuclear plants alone amounted to $10 billion.[20] Some of these losses were passed on to ratepayers, contributing to the three-fold increase in electric rates between 1972 and 1984; other losses were born by utilities, causing considerable financial distress within the industry, especially among those utilities that were slow to cancel power plants in response to changing conditions.[21] Resource planning laws around the country rose partly to prevent utilities from making similar mistakes. The Commission's SONAR stressed that "it is possible to minimize the effect of planning errors if utility plans remain flexible and respond to changing conditions."[22]

Resource planning gives the Commission a well-timed opportunity to minimize costly planning errors by responding to changed circumstances before significant investments have been made. The Commission's rules require that it evaluate resource plans based on whether they "enhance a utility's ability to respond to changes in the financial, social, and technological factors affecting its operations."[23] If prudence requires that utilities diligently react to changing circumstances, even to the point of withdrawing from power plant projects that have been

[18] Minn. Pub. Utils. Comm'n, *In the Matter of the Proposed Adoption of Rules Governing the Resource Planning Process for Electric Utilities, Minn. Rules, Parts 7843.0100 to 7843.0600*, Statement of Need and Reasonableness, Docket No. E-999/R-89-201, 21 (Jan. 19, 1990) *available at* https://www.leg.state.mn.us/archive/sonar/SONAR-01617.pdf [hereinafter IRP SONAR].
[19] U.S. Cong. Budget Office, *Financial Condition of the U.S. Electric Utility Industry*, 11-12 (Mar. 1986) *available at* https://www.cbo.gov/sites/default/files/99th-congress-1985-1986/reports /doc10b-entire_1.pdf.
[20] *Id.*
[21] *Id.* at 9, 13, 15-16.
[22] IRP SONAR at 21.
[23] Minn. R. 7843.0500, subp. 3(D).

previously approved and on which millions have been spent, surely the Commission should consider changing circumstances when assessing whether a utility's long-term resource plan is in the public interest under Minn. Stat. § 216B.2422, subd. 2. If anything, the Commission's rules, combined with the forward-looking nature of resource planning, demands an even keener focus on changing conditions.

In short, whether continuing to pursue the Sherco CC is in the public interest is a question that must be assessed in the light of changing circumstances. The 2017 legislation does not alter the Commission's authority and responsibility to make this finding under the IRP statute, and the prospect of a prudence assessment in a future rate case is not an adequate substitute for assessing whether the Sherco CC is in the public interest today.

C. Circumstances Have Changed Dramatically Since The 2017 Legislation, Making It Far Riskier To Build A Large New Source Of Carbon Emissions Like The Sherco CC Unit.

In 2017, when the legislature passed the law allowing the Sherco CC unit to bypass the certificate of need process, it was much less obvious that building a new gas plant was inconsistent with achieving Minnesota's and the world's climate protection goals. Policymakers were focused on the unquestionable need to retire coal plants and many saw substituting gas as a sufficient step in the right direction. Reducing power sector emissions to net zero was not yet part of the policy debate. The threat posed by methane leakage from natural gas production and transmission was largely unrecognized. Renewable power was more expensive than today and deployment of energy storage technologies by utilities was far smaller. The most burdensome future climate regulation typically imagined for new gas plants was a price on carbon, and the 2016 election made it clear that even a carbon price was unlikely for years. Things have changed.

1. The climate science now shows the need to cut global GHGs in half by 2030 and reach net zero by 2050, transforming the policy discussion, especially around the power sector.

In 2018, the Intergovernmental Panel on Climate Change ("IPCC") issued its landmark report discussing the dangers of allowing the planet to warm more than 1.5 degrees C above preindustrial temperatures.[24] The nations of the world had already agreed under the 2015 Paris Agreement to pursue efforts to limit warming to 1.5 degrees C above preindustrial temperatures, and the 2018 report made the sobering finding that staying below that limit would require cutting GHG emissions roughly in half by 2030, demanding a pace of emissions reductions far faster than most policymakers previously understood. Moreover, the world would have to reach net zero GHG emissions by 2050 and then likely need negative emissions in the second half of the century.[25]

This report had a galvanizing effect on climate protection efforts. It spurred climate protests attended by millions around the world in 2019 and amplified demands for accelerated decarbonization.[26] Today, 124 nations have pledged to reach net zero GHG emissions by mid-century,[27] as have many US states, cities, and corporations. Xcel Energy was the first major utility to announce a corporate goal of achieving net-zero emissions by 2050, but it is now standard for major U.S. utilities to embrace that goal.[28]

[24] Intergovernmental Panel on Climate Change ("IPCC"), *Special Report: Global Warming of 1.5º C: Summary for Policymakers* (2018) *available at* https://www.ipcc.ch/sr15/chapter/spm/.
[25] *Id.*, sections C.1, C.3.
[26] Matthew Taylor et al., *Climate Crisis: 6 Million People Join Latest Wave of Global Protests*, Guardian (Sept. 27, 2019) *available at* https://www.theguardian.com/environment/2019/sep/27/climate-crisis-6-million-people-join-latest-wave-of-worldwide-protests.
[27] *Net-zero carbon pledges must be meaningful to avert climate disaster*, Nature (Mar. 31, 2021) *available at* https://www.nature.com/articles/d41586-021-00864-9.
[28] Dan Gearino, *Inside Clean Energy: Net Zero by 2050 Has Quickly Become the New Normal for the Largest U.S. Utilities*, Inside Climate News (Oct. 1, 2020) *available at* https://insideclimatenews.org/news/01102020/inside-clean-energy-net-zero-2050-utilities/.

This heightened understanding of the urgency of cutting GHGs, along with record-setting wildfires and other climate disasters, helped transform climate change into a top-tier political issue in the U.S., both before the 2020 election and since. President Biden returned America to the Paris Agreement, under which each nation submits a Nationally Determined Contribution ("NDC") setting forth how it plans to contribute to achieving the Agreement's goals. On April 22 of this year, he announced to a summit of world leaders an updated U.S. NDC in line with what the 2018 IPCC report says is needed, adopting the goal of cutting the nation's GHGs by 50-52% from 2005 levels by 2030.[29] It is part of the federal administration's longer-term goal of reaching net-zero GHG emissions across the U.S. economy by 2050. The next day the governors of 24 states, including Minnesota, similarly pledged to reduce net GHG emissions at least 50-52% by 2030 and to collectively achieve overall net-zero emissions at least by 2050.[30]

Moreover, for the power sector, the federal administration has embraced the far more ambitious goal of achieving *100 percent carbon-free electricity nationwide by 2035*.[31] The proposed policy vehicle would be a Clean Energy Standard, which operates not unlike a renewable energy standard, requiring electricity providers to provide increasing percentages of carbon-free electricity until they reach 100% in 2035.[32] It makes sense to cut emissions more quickly from the

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[29] White House, *Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies*, (Apr. 22, 2021) *available at* https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/ [hereinafter "White House Fact Sheet"].

[30] United States Climate Alliance, *U.S. Climate Alliance Commits to Achieve Net-Zero Emissions No Later than 2050* (Apr. 23, 2021) *available at* http://www.usclimatealliance.org/publications /newtargets.

[31] White House, Fact Sheet.

[32] Leah Stokes, et al., *A Roadmap to 100% Clean Electricity by 2035: Power Sector Decarbonization through a Federal Clean Energy Standard and Robust Clean Energy Investments*

power sector than from the rest of the economy because of the tremendous advances in renewable energy and storage. The administration has also proposed, in its recent infrastructure plan, to invest hundreds of billions of dollars to further advance carbon-free energy, update the transmission grid, and otherwise accelerate the decarbonization of the nation's electricity sector.[33]

The prospect that the power sector may need to completely decarbonize by 2035 under a Clean Energy Standard illustrates the profound shift in thinking in the last few years about the urgency of the climate crisis and the policies needed in response. It represents a level of potential regulation of GHGs far more restrictive than the cap-and-trade plans discussed in years past, none of which were aimed at complete decarbonization of the power sector by 2035. By way of comparison, the Waxman-Markey cap-and-trade bill that passed the U.S. House in 2009 aimed for 83% reductions economy-wide by 2050.[34]

When the Commission first started requiring utilities to consider future carbon regulatory costs, it was reflecting the costs considered most likely to emerge from the climate policies then at the center of the state and federal debate. However, the range of future carbon regulatory costs that the Commission uses no longer reflects the policy at the center of today's climate debate in Washington, D.C. It does not even reflect the scope of policy debate in Minnesota. In January of this year Governor Walz and many legislators announced their support for 100% clean electricity in Minnesota by 2040, a target nearly as ambitious as the Biden administration's 2035 target.[35]

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and Justice-Centered Policies, Evergreen Collaborative and Data for Progress (Feb. 2011) *available at* https://collaborative.evergreenaction.com/policy-hub/100-clean.

[33] White House, *Fact Sheet: The American Jobs Plan*, (Mar. 31, 2021) *available at* https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/.

[34] *Waxman-Markey Short Summary*, Center for Climate and Energy Solutions (2009) *available at* https://www.c2es.org/document/waxman-markey-short-summary/.

[35] Office of Governor Tim Walz and Lt. Governor Peggy Flanagan, *Governor Walz, Lt. Governor Flanagan, House and Senate DFL Energy Leads Announce Plan to Achieve 100 Percent Clean*

This level of change in the policy discussion can and should be part of the Commission's risk analysis informing its public interest determination.

Obviously, these proposed standards face tremendous political obstacles. Political gridlock could stall them in the short term and the next election could delay them for years. However, such delays would likely just mean that utilities would need to make ever steeper emission reductions later, unless we accept that the world will simply fail to seriously pursue the cuts the science says we need to meet the Paris goals. While that cannot be ruled out, it would be beyond imprudent to make a major long-term investment that actually counts on such a failure, particularly given the dire consequences failure would have for the world.

2. Multiple studies now show that new gas plants like the Sherco CC unit are fundamentally inconsistent with the rate of deep decarbonization needed to meet climate goals.

New national modeling analyses have recently emerged showing that the deep decarbonization targets discussed above are indeed achievable, but the pathways to get there preclude construction of new gas plants like the Sherco CC unit.

One set of studies focuses on cutting economy-wide GHG emissions in half by 2030, consistent with the IPCC 2018 report and the nation's newly-announced NDC. A March 2021 study published by the Center for Global Sustainability at the University of Maryland shows how the nation could cut emissions by 51% by 2030.[36] The study stresses that the majority of these emission reductions would come from the power sector, concluding that "U.S. climate ambition by 2030 hinges fundamentally on the ability to rapidly shift to zero-emissions electricity

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Energy in Minnesota by 2040 (Jan. 21, 2021) *available at* https://mn.gov/governor/news/?id=1055-463873.

[36] Nathan Hultman, et al., *Charting an Ambitious U.S. NDC of 51% Reductions by 2030*, Univ. Md. Center for Global Sustainability (Mar. 2021) *available at* https://cgs.umd.edu/research-impact/publications/working-paper-charting-ambitious-us-ndc-51-reductions-2030.

generation."[37] Achieving these cuts requires largely eliminating coal power without carbon capture and storage ("CCS") by 2030 and requiring CCS on new gas plants by 2025 – before the Sherco CC unit is scheduled to come online.[38]

Another modeling study, published by Energy Innovation in February 2021, similarly finds that the nation can cut emissions in half by 2030 consistent with the new U.S. NDC, and that particularly deep emission cuts must come from the power sector.[39] The linchpin of this reduction is a Clean Energy Standard that requires 80% clean electricity in 2030 and 100% in 2035,[40] consistent with the Biden Administration's proposed policy. This analysis concludes that, in addition to eliminating coal power by 2030, "[c]utting electricity emissions in line with a 1.5 C target also requires not building any new gas plants that lack carbon capture," a restriction which causes "no new gas plants to be built where construction has not already commenced."[41]

A major 2020 analysis published by the Goldman School of Public Policy at the University of California Berkeley focused directly on electricity, charting a path for reducing power sector GHG emissions by 90% by the year 2035.[42] It found that this level of deep decarbonization is not only achievable but results in wholesale electric costs lower than today's and yields tremendous health and environmental advantages.[43] The emission reduction pathway modeled in this study also eliminated coal power and included no new gas plants beyond those already under

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[37] *Id.* at 2.
[38] *Id.* at 2, Technical App. at 4.
[39] Robbie Orvis, *A 1.5 Celsius Pathway to Climate Leadership for the United States*, Energy Innovation (Feb. 2021) *available at* https://energyinnovation.org/wp-content/uploads/2021/02/A-1.5-C-Pathway-to-Climate-Leadership-for-The-United-States.pdf.
[40] *Id.* at 4.
[41] *Id.* at 8.
[42] *2035: The Report: Plummeting Solar, Wind and Battery Costs Can Accelerate our Clean Energy Future*, Goldman School of Public Policy (June 2020) *available at* https://www.2035report.com /electricity/ [hereinafter "2035 Report"].
[43] *Id.* at 4-5.

construction.[44] It is worth noting that existing coal and new gas are excluded from this modeled pathway even though this study aims for only 90% reductions in sector emissions by 2035, not the 100% supported by President Biden. While not all existing gas plants are retired by 2035 under this modeled pathway, the remaining plants operate at very low-capacity factors.[45]

At least three other major new studies published just since December of 2020 model pathways to achieving the longer-term goal of net-zero U.S. GHG emissions economy-wide by 2050.[46] These studies model less ambitious pathways than the studies mentioned above because they do not aim for the roughly 50% emission cuts by 2030 that the IPCC report says are needed. Even so, they all stress the need for aggressive action in the next 10 years, including dramatically accelerating the deployment of renewables and energy storage. For example, one of the new reports, by the National Academies, finds that the nation needs to deploy by 2030 about two to three times existing wind capacity and about four times existing solar capacity, plus add 10-60 GW of new battery storage.[47] The report stresses that the precipitous drop in price of all these technologies – between nearly 70 and 90 percent in just the past decade – has "transformed the economics of decarbonization."[48] While the pathways identified in these three reports do not

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[44] *Id*. at 20.
[45] *Id.* App. at 50.
[46] *Accelerating Decarbonization of the U.S. Energy System*, National Academies of Sciences, Engineering, and Medicine, The National Academies Press (2021) *available at* https://www.nap.edu/catalog/25932/accelerating-decarbonization-of-the-us-energy-system; James H. Williams, et al., *Carbon-Neutral Pathways for the United States*, *AGU Advances* (2021) *available at* https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2020AV000284; Eric Larsen, et al., *Net Zero America: Potential Pathways, Infrastructure, and Impacts, Interim Report*, Princeton, New Jersey (2020), *available at* https://acee.princeton.edu/rapidswitch/projects/net-zero-america-project/.
[47] National Academies, *supra* note 46 at 55.
[48] *Id*. at 3, 43.

involve retiring existing gas plants in this decade, they all present scenarios showing gas generation declining by 2030 and gas plant capacity factors falling dramatically.[49]

In sum, the nation is poised to launch into a decade of deep and accelerating decarbonization of its electric sector, both because it has to (according to the climate science) and because it can (according to these analyses and thanks to advances in clean technology). If Xcel builds the Sherco CC unit, it could find itself needing to retire it in 2035 – within the term of this IRP and just a few years after bringing it online. Or, it could find itself blocked from bringing the Sherco CC unit online unless it added costly carbon capture and storage, dramatically raising its cost or leading to its cancellation after millions were spent on construction. Or it could find itself forced to operate the unit at an extremely low-capacity factor, either due to climate policies or because it cannot compete economically with renewable energy and storage technologies that are advancing at an accelerating pace with the full weight of federal policy behind them.

It is not in the public interest to include the Sherco CC in Xcel's approved resource plan in the face of these risks. Especially when, as the CEOs' modeling shows, that plant is neither needed nor the least cost option even without factoring in these risks.

3. New data about methane leakage from gas extraction and transportation substantially increases the estimated lifecycle climate impact of gas plants.

Another changed circumstance affecting whether continued pursuit of the Sherco CC unit is in the public interest is new information about the climate impact of methane leakage associated with gas extraction and transportation. This concern was highlighted by the Department of

[49] *Id*. at 55 (gas generation declines 10-30% by 2030); Williams et al., *supra* note 46 at 12, Fig. 7 (showing capacity factors for CCGT units starting to plummet around 2025); Larson et al., *supra* note 46 at 30, 87 (gas generation declines 2-30% by 2030, except in one of the five scenarios examined, in which renewable energy is constrained and which relies more heavily on carbon capture and storage).

Commerce Deputy Commissioner, Aditya Ranade, in his February 11, 2021 comments, and it is a concern the CEOs share. The relative climate benefit of a natural gas plant over a coal plant depends upon estimates of associated methane leakage, and recent studies indicate that the Environmental Protection Agency ("EPA") has long underestimated the rate of that methane leakage.

A major 2018 study estimated that 2.3% of natural gas production is leaked or vented to the atmosphere during extraction, processing, and transportation.[50] This estimate is about 60% higher than the methane leakage calculation EPA has traditionally used. If correct, these upstream emissions would make a gas plant's climate impact roughly twice what it would be if looking only at the plant's direct carbon emissions over a 20-year time horizon. Moreover, a 2020 study, which analyzed methane emissions using satellite technology, found an even higher rate of leakage from the Permian Basin in the southwest U.S. This study estimated that 3.7% of the gas extracted there is leaked or vented, which would make the lifecycle climate impact of a power plant burning this gas even worse than coal plants, at least over a two-decade period.[51]

Global atmospheric concentrations of methane have been rising at an alarming rate, surging even during the pandemic conditions of 2020.[52] A new UN report stresses the urgent need to reduce

[50] Ramon A. Alvarez, et al. *Assessment of methane emissions from the U.S. oil and gas supply chain*, Science, Vol. 361, Issue 6398 at 186-188 (2018) *available at* https://science.sciencemag .org/content/361/6398/186.

[51] Yuzhong Zhang, et al. *Quantifying methane emissions from the largest oil-producing basin in the United States from space*, Science Advances, Vol. 6, Issue 17 (Apr. 22, 2020) *available at* https://advances.sciencemag.org/content/6/17/eaaz5120. *See also* Adam Vaughan, *Fracking wells in the US are leaking loads of planet-warming methane*, NewScientist (Apr. 22, 2020) *available at* https://www.newscientist.com/article/2241347-fracking-wells-in-the-us-are-leaking-loads-of-planet-warming-methane/.

[52] Nat'l Oceanic Atmospheric Admin., *Despite Pandemic Shutdowns, carbon dioxide and methane surged in 2020* (Apr. 7, 2021) *available at* https://research.noaa.gov/article/ArtMID/587/Article ID/2742/Despite-pandemic-shutdowns-carbon-dioxide-and-methane-surged-in-2020.

methane in this decade, including from the oil and gas sector.[53] In sum, the unresolved issue of methane leakage further undermines the logic of building a new gas plant just as the world accelerates its climate protection efforts.

D. CEOs Agree With The Department That The 2017 Legislation Does Not Exempt The Sherco CC Potential Pipeline From The Required Certificate Of Need.

Finally, CEOs agree with the Department of Commerce's conclusion that a future pipeline needed to serve the Sherco CC is not included in the 2017 legislation and, thus, would require a certificate of need and site permit.[54] This requirement applies to a "pipeline for transporting natural or synthetic gas at pressures in excess of 200 pounds per square inch with more than 50 miles of its length in Minnesota."[55] This pipeline would be a necessary part of the proposed Sherco CC and the lack of details regarding the length, cost, and route of the pipeline adds risk and creates even more uncertainty as to whether this plant is a prudent investment of ratepayer money.

II. ENERGY FUTURES GROUP SUPPLEMENTAL REPORT PROVIDES ADDITIONAL ENCOMPASS MODELING INSIGHT

Attached to CEOs' reply comments, we provide a Supplemental Report prepared by Energy Futures Group ("EFG") providing EnCompass modeling analysis that builds on the analysis provided in CEOs' initial comments. We highlight and summarize two aspects of the Supplemental Report relating to additional modeling analysis of the Sherco CC and Xcel's methods for modeling demand response.

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[53] United Nations Environment Programme, *Global Assessment: Urgent Steps Must be Taken to Reduce Methane Emissions This Decade* (May 6, 2021) *available at* https://www.unep.org/news-and-stories/press-release/global-assessment-urgent-steps-must-be-taken-reduce-methane.
[54] DOC Initial Comments at 45.
[55] Minn. R. 7851.0010, subp. 13 (definition of "large gas pipeline").

A. Additional Modeling Shows That A Renewable Alternative Is Less Expensive Than The Sherco CC In Xcel's Own Plan.

EFG performed an EnCompass modeling run to further analyze the CEOs' alternative to the Sherco CC proposed in our initial comments: solar/battery hybrid resources consisting of 1000 MWs of solar with 250 MWs of battery storage.[56] CEOs' modeling in initial comments developed our preferred plan with no new fossil resources that is less expensive, has fewer carbon emissions, and is less risky than Xcel's preferred plan.[57] The CEOs Preferred Plan also includes an optimal replacement resource for the Sherco CC, the solar/battery hybrid resource described above. In addition to comparing complete resource plans, for this reply, EFG performed a modeling run to test CEOs' Sherco CC alternative against the Sherco CC in Xcel's own preferred plan. As such, for this run, EFG took Xcel's Preferred Plan and simply swapped out the Sherco CC and replaced it with CEOs' alternative hybrid resource in 2027. It found that Xcel's Preferred Plan with CEOs' alternative replacing the Sherco CC is less expensive than Xcel's Preferred Plan with the Sherco CC.[58] This result is consistent with CEOs' EnCompass modeling in initial comments that found the Sherco CC is not an economic resource.

Table 1. PVSC Under Xcel Corrected Base Case [59]

Run Name	PVSC
Xcel Preferred – Replace Sherco with Solar Hybrid 2027	$40,501
Xcel Fixed Preferred Plan	$40,801

[56] EFG Initial Report at 19.
[57] *Id.* at 34.
[58] EFG Supplemental Report, Table 1.
[59] *Id*.

B. Xcel Should Appropriately Model Demand Response Resources In EnCompass.

EFG's analysis of Xcel's modeling also identified what we believe to be a flaw in modeling demand response resources. For demand response, Xcel included an additional dispatch cost, which is unrelated to the actual resource cost, but is put in place "to ensure [demand response resources] were the final resources to be dispatched in the model during a peak load/capacity shortfall event to reflect actual operational practices."[60] With this limitation, in most of Xcel's modeling runs, demand response is not actually used or dispatched until 2037. As EFG's Supplemental Report states, "[t]hat demand response is currently the last resource to be utilized during a shortfall event is not a reasonable justification for a DR dispatch adder in modeling; rather, DR is a resource that should be optimized around its attributes like any other resource." Xcel's use of this methodology prevents the modeling from accurately capturing the full value from demand response.[61]

As we move to a decarbonized electric system with significant electrification it will only become more important to capture the potential of load flexibility, including from traditional and evolving demand response offerings, in IRPs. Therefore, we recommend that the Commission require that Xcel include improved load flexibility and demand response modeling methodologies going forward and in its next resource plan. CEOs would welcome the opportunity to work with Xcel on new approaches to this issue.

[60] Xcel response to CEO IR 130a, Docket No. E002/RP-19-368 (Apr. 20, 2021).
[61] EFG Supplemental Report, Section 4.

III. CEOS SUPPORT INCLUDING THE MONTICELLO OPERATING EXTENSION IN XCEL'S CURRENT RESOURCE PLAN

The CEOs' Preferred Plan, as put forward in our initial comments, adopted the same nuclear unit operating assumptions as Xcel's Preferred Plan, including assuming the Monticello unit operates until 2040.[62] CEOs continue to include the Monticello operating life extension through 2040 in our CEOs' Preferred Plan in this docket. Similarly, the Citizens Utility Board's "Consumers Plan," prepared by Vibrant Clean Energy, included the Monticello 10-year extension.[63] This result is consistent with Vibrant Clean Energy's national decarbonization modeling, where its modeling retains significant existing nuclear capacity.[64]

The Monticello nuclear plant provides a significant amount of carbon-free electricity that has important system benefits when taken as a whole. The Monticello plant is an existing carbon-free generator that can help support a power system that relies on very high levels of renewable energy during periods of low wind and solar availability. Indeed, the University of California-Berkeley's *2035 Report and 2030 Report* found that existing nuclear power was a key part of the 90% carbon-free by 2035 scenario and the 80% by 2030 scenario "during periods of very high demand and/or very low renewable generation."[65] Moreover, the Monticello unit is already interconnected to the MISO system.

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[62] CEO Initial Comments at 10-14.

[63] Citizens Utility Board of Minnesota Initial Comments, *In the Matter of Xcel Energy's 2019-2034 Upper Midwest Integrated Resource Plan*, Docket No. E002/RP-19-368, App. A at 21 (Feb. 11, 2021) [hereinafter "CUB Initial Comments"].

[64] *See Insights from Modeling the Decarbonization of the United States Economy by 2050*, Vibrant Clean Energy, Presentation to University of California San Diego Deep Decarbonization Initiative, (January 27, 2021) *available at* https://vibrantcleanenergy.com/wp-content/uploads/2021/01/VCE-UCSD-01272021.pdf.

[65] 2035 Report, *supra* note 42 at 4; *see also* EFG Initial Report at 1.1.4 (highlighting that in CEOs' EnCompass modeling the retirement of Monticello in 2040 was a significant contributing factor to the occurrence of "unserved" energy in the period 2040-2045).

CEOs performed additional EnCompass modeling to further assess the costs of the Monticello extension to 2040.[66] Overall, this modeling shows that the Monticello extension appears to be a reasonable option at this time under a range of cost assumptions. To analyze the cost impacts of the Monticello extension to 2040, we compared two sensitivities to our CEO Preferred Plan: one where Monticello is not extended and retires in 2030 and one where we used higher capital and O&M costs than Xcel provided. The latter, "higher contingency costs," sensitivity was developed by staff at the Union of Concerned Scientists. This sensitivity is intended to quantify the risk reflected in the uncertainty around future costs. These higher cost assumptions include the Department of Commerce's assumption of an additional 1% annual increase in O&M costs,[67] and a 25% increase in annual capital expenditures, or $5 million per year between 2024 and 2040, to reflect higher contingency costs based on the 2020 Global Energy and Water Consulting report.[68] We also included an additional $3 million dollars per year over five years to capture the additional costs to prepare a subsequent license renewal ("SLR") application to the U.S. Nuclear Regulatory Commission ("NRC") that is required for permission to extend the operating life of the Monticello plant and would bring the total cost of the application to the low end of the **[TRADE SECRET BEGINS… …TRADE SECRET ENDS]** range

[66] See EFG Supplemental Report, Section 2.3.
[67] DOC Initial Comments at 57-58.
[68] Trade Secret Comments of the Minn. Dep't of Commerce, Division of Energy Resources, Docket No. E002/RP-19-368 (Dec. 23, 2020), Attachment: *Final Report to the Dep't of Commerce, Energy Division of the State of Minnesota: Independent Investigation of Cost Overruns and Cost Estimates for Xcel Energy's Monticello and Prairie Island Nuclear Plants,* Global Energy and Water Consulting, LLC, at 8 ("Not until a project is determined to be necessary and its schedule for deployment is it possible to determine a level of contingency less than 50%...Xcel's use of contingencies in many cases appears to understate the appropriate level for a project that costs and schedule are relatively distant in the planning process.") [hereinafter "Global Report"].

cited in the Global report.[69] The PVSC of these sensitivities and the CEOs Preferred Plan are provided in Table 2.

Table 2. PVSC Comparison of Monticello Runs (Millions of Dollars)

Run Description	CEO Base Case
CEO Preferred Plan Additional Nuclear Costs	$38,740
CEO Preferred Plan (includes Monticello extension to 2040)	$38,482
No Monticello Extension	$38,605

Including the additional O&M and capital expenditure assumptions for the Monticello unit increases the cost of the CEO Preferred Plan by about 0.7%. When comparing the CEO Preferred Plan (Monticello retires at the end of 2040) with the No Monticello Extension sensitivity, the CEO Preferred Plan is slightly lower in cost (0.3%). Given these modeling results, the Monticello extension's cost is reasonable given that current information and including higher contingency costs does not indicate a high enough level of cost risk at this time to outweigh other benefits and considerations.

In addition, the results of our modeling are consistent with recent national deep decarbonization studies. CEOs find these analyses compelling. These studies find that keeping existing and safely operating nuclear units online in the U.S. is important in the near-term for reducing emissions from the electric system as we accelerate the ramp-up of renewable energy, energy efficiency, and storage to replace existing coal plants; reduce natural gas generation; and work towards a net-zero carbon economy by 2050.[70]

[69] Global Report at 12.
[70] *See* 2035 Report, *supra* note 42 (analyzing achieving a 90% carbon-free electric system by 2035 and includes existing nuclear units that are not already planned for retirement); Larsen, *supra* note 46 (five net-zero carbon pathways are analyzed, 4 assume 50% of the U.S. nuclear fleet is extended to 80 operating years); Williams, *supra* note 46 (finding that maintaining current nuclear capacity is a high confidence required action); Larsen et al., *Pathways to Build Back Better: Investing in*

When considering the findings from this national research and our modeling that indicates the costs are reasonable using a range of assumptions, CEOs continue to support including the Monticello extension in Xcel's current Resource Plan. However, it is important that Xcel not underestimate the costs or potential costs of continuing to operate existing nuclear plants for 60 years or more compared to other low-carbon alternatives that are projected to become less expensive over time. Given the cost uncertainty, we recommend that the Commission continue to review updated cost forecasts from Xcel and other industry benchmarks as the Monticello license extension moves through additional regulatory processes.

CEOs also assert that existing reactors like Monticello should only receive additional license extensions if they can continue to meet high safety standards through implementing strong aging management programs and address outstanding safety issues, including through potential voluntary measures to provide added protection of public health and the environment over the period of extended operation. These conditions can vary by reactor depending on the reactor type, location, and other conditions; accordingly, the NRC's review of any SLR application by Xcel for Monticello will be a key procedural element for ultimately deciding whether to extend the operating life of the plant. For example, Monticello is a Mark I boiling-water reactor, and this design has defects that contributed to the severity of the March 2011 Fukushima nuclear meltdowns in Japan. Given that the NRC is not requiring that Monticello or other plants of its type update their defenses against flooding and other natural disasters to address current and future risks, there are concerns that must be considered with respect to prolonging operating lifetimes.

100% Clean Electricity, Rhodium Group at 7 (Mar. 23, 2021) (provides four key actions needed to fully decarbonize the electric system. One of these four is to retain existing clean capacity: "Getting to zero will be easier and happen faster if existing clean generators such as hydro and nuclear plants stay on the grid longer.").

IV. THE RENEWABLE INVESTMENTS IN THE CEOS' PREFERRED PLAN WOULD DELIVER BILLIONS IN ECONOMIC BENEFITS TO MINNESOTA BUSINESSES, HOUSEHOLDS, WORKERS AND COMMUNITIES

Socioeconomic effects are among the factors the Commission must consider when evaluating major resource options in a resource plan proceeding.[71] The economic impact of the over 10,000 MW of renewable energy investments proposed in CEOs' Preferred Plan over the next fifteen years have recently been analyzed in detail by the Anderson Economic Group. That analysis, included as Attachment 2, finds that the construction and operation of the renewable energy assets in the CEOs' Preferred Plan would support $3 billion in output (sales) for Minnesota businesses between 2024 and 2034.[72] This includes economic activity associated with both construction ($2.6 billion) and operations ($430 million).[73]

This $3 billion worth of sales to Minnesota businesses would support $1.9 billion in earnings for Minnesota households and 4,234 jobs annually.[74] Moreover, the renewable assets of the CEOs' Preferred Plan would support tax revenues to state and local governments of $243 million between 2024 and 2034, consisting of $135 million for the state and $108 million for local governments.[75]

The Anderson Economic Group also analyzed the economic benefits associated with the 5750 MW of renewable energy assets proposed in Xcel's Preferred Plan. Xcel's proposed renewable energy assets would also deliver substantial economic benefits across Minnesota, but significantly less than the renewable energy in CEOs' Preferred Plan. For example, Xcel's renewable investments would support $2 billion in output by Minnesota businesses between 2024

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[71] Minn. Rules 7843.0400, subp. 3(A) and 7843.0500, subp. 3(C); Minn. Stat. § 216B.2422, subd. 3(a).
[72] Attachment 2, at 5.
[73] *Id.* at 12, 13.
[74] *Id.* at 5, 12, 13.
[75] *Id.* at 6, 16-19.

and 2034, and 2,769 jobs annually,[76] rather than $3 billion in output and 4,234 jobs under the CEOs' Preferred Plan. If Xcel were to substantially increase its investment in renewable assets over the years ahead, it would be able to deliver closer to the $3 billion in economic activity currently associated with the CEOs' Preferred Plan.

CONCLUSION

Xcel's IRP treated the Sherco CC as locked in, and the Company failed to explore renewable alternatives to the gas plant. CEOs and other stakeholders have presented the Commission with ample evidence that the Sherco CC is not in the public interest. The proposed gas plant will cost ratepayers more money than renewable alternatives, and it is not needed for reliability. Moreover, the Sherco CC will inhibit Minnesota's ability to rapidly decarbonize the power sector. Given the increasingly urgent and obvious need for that decarbonization, the Sherco CC is a risk Minnesota need not and should not take.

Therefore, the CEOs respectfully request the Commission:

1. reject Xcel's Preferred Plan and adopt CEOs' Preferred Plan; or

2. approve Xcel's Preferred Plan with the following modifications:

   a. Remove the Sherco CC from Xcel's resource plan;

   b. Add a hybrid resource consisting of 1,000 MW of solar and 250 MW of four-hour battery storage in 2027; and

3. require that Xcel include improved load flexibility and demand response modeling methodologies going forward and in its next resource plan.

[76] *Id.* at 3.

Respectfully submitted,

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