UPPER MIDWEST
LAW CENTER

June 24, 2021

Via E-filing

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

Re: In the Matter of Xcel Energy's 2020-2034 Upper Midwest Integrated Resource Plan
Docket No. E-002/RP-19-368

Dear Mr. Seuffert:

I represent, along with my colleague Attorney James Dickey, also of the Upper Midwest Law Center ("UMLC"), the Center of the American Experiment ("CAE"), which wishes to offer reply comments on Xcel Energy's Supplemental Integrated Resource Plan at issue in this proceeding.

CAE's reply comments, prepared by Isaac Orr and Mitch Rolling of CAE, are attached hereto.

UMLC reserves the right, on CAE's behalf, to submit further comments and replies to the comments of other parties in the event a further extension to the reply comment period is granted by the PUC, and to proceed with any applicable appeals or challenges to any forthcoming decision of the PUC.

Respectfully,

Douglas Seaton, Esq., President of UMLC
Attorney for Center of American Experiment

Attachment

cc: Service List
James V.F. Dickey, Esq.
Isaac Orr
Mitch Rolling

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Prepared by Isaac Orr and Mitch Rolling

Xcel IRP Reply Comments

Center of the American Experiment submits the following reply comments for Docket No. E-002/RP-19-368 related to Xcel's 2020-2034 Upper Midwest Integrated Resource Plan (IRP) for consideration of the Minnesota Public Utilities Commission (PUC)

Introduction

Center of the American Experiment submitted initial comments relating to this docket to the Minnesota PUC on February 11, 2021.

Since that time, we have had the opportunity to review and analyze the positions of other stakeholders who have also submitted comments in this docket relating to Xcel's 2020-2034 IRP. Our reply comments will address some of these positions, as well as offer recommendations that we believe are the most reasonable for the members of the PUC to implement.

Our Position

American Experiment submits these comments with the intent of keeping electricity rates fair and reasonable for all Xcel customers, which represent nearly half of all ratepayers in Minnesota.

Our initial filing demonstrated that electricity rates for Xcel customers of all rate classes, except for commercial, are currently above the national average. This is alarming when considering that, in 2002, Xcel's residential, commercial and industrial rates were 9 percent, 28 percent, and 18 percent below the national average, respectively. Today, residential rates are 5 percent

higher, commercial rates are 2.6 percent lower, and industrial rates are 18 percent higher than the national average.

Xcel's industrial rates, specifically, have increased by 100 percent since 2002, compared to only 40 percent for the rest of the U.S., meaning Xcel's electricity rates have been increasing at a rate 2.5 times faster than the national average. In addition, Xcel's residential and commercial rate classes have outpaced the national average since 2002 by 43 and 134 percent, respectively.

Xcel's significant rate hikes in recent years are directly attributable to the utility company implementing Minnesota law mandating Xcel to produce 30 percent of its electricity using renewable energy sources. And, while Minnesota mandates played a substantial role in past rate increases, future increases because of Xcel's Preferred Plan will largely be the result of internal company goals that Xcel has set for itself and are not mandated by Minnesota law.

The rapid rate increases experienced by Xcel customers in recent years are not fair nor are they reasonable, and it calls into question the pace at which Xcel has been transitioning to unreliable wind and solar resources. If Xcel cannot transition to renewables without substantially increasing electricity rates on its customers, then it should not be allowed to continue raising rates on Minnesota families and businesses in perpetuity while prices become less competitive with those nationally.

This is especially true when considering Minn. Stat. 216C.05, subd. 2 (4), which states that "it is the energy policy of the state of Minnesota that" for each customer class, electricity rates "be at least five percent below the national average."[1]

As of today, every rate class in the state of Minnesota is in breach of this policy because of significant rate hikes at Xcel Energy in recent years.[2] Indeed, electricity rates for Otter Tail Power Company and Minnesota Power are below the national average for every rate class, as Figure 1 shows, meaning Xcel is nearly exclusively responsible for Minnesota's price disadvantage with the rest of the U.S.

[1] 2020 Minnesota Statutes, "Chapter 216C. Energy Planning and Conservation," https://www.revisor.mn.gov/statutes/cite/216C.05.

[2] Residential, commercial, and industrial rates in Minnesota are higher than state policy requires by 5.5 percent, 1.9 percent, and 16.4 percent, respectively,

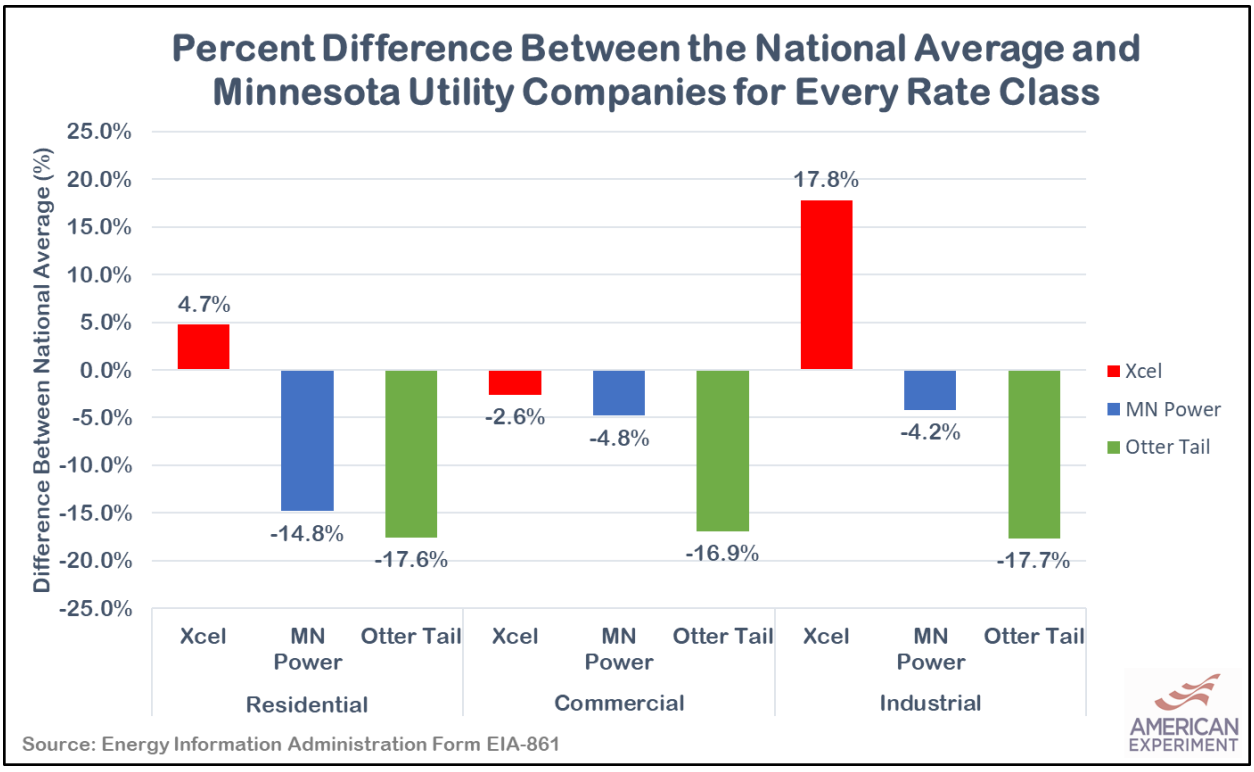

Figure 1. Shows that Xcel Energy is outpacing Minnesota Power and Otter Tail Power in comparison to the national average in every single rate class. Furthermore, regarding industrial rates, Xcel is nearly 18 percent higher than the national average, while Otter Tail is nearly 18 percent lower.

We ask the PUC Commissioners to consider our reply comments to keep electricity prices fair and reasonable for all Xcel customers. Specifically, our reply comments bring attention to the following issues:

1. **Coal Plants –** Minnesota ratepayers fund the building of power plants with the intention of getting their money's worth for each investment. We argue that ratepayer-funded coal facilities should remain open and utilized to their fullest potential throughout the course of their useful lives, allowing Minnesota ratepayers to reap the full benefits and savings from the inexpensive electricity these plants produce. Based on Xcel's 2019 Annual Review of Remaining Lives, A.S. King has a remaining life of 16 years (middle of 2037), while Sherco Unit 3 has a remaining life of 15 years (2036). Xcel's Preferred Plan is proposing to shutter these facilities 10 (A.S. King) and 7 (Sherco Unit 3) years before the end of their useful lives, as well as run Sherco Unit 2 seasonally until it retires in 2023. These proposals should be dismissed on the basis that they will rob Xcel customers of their access to low-cost, reliable electricity that they have bought and paid for.

2. **Prioritize Affordability –** The pace of the transition toward renewable energy sources has already proven costly for millions of Minnesota electricity customers, specifically

those with Xcel Energy. We believe that any scenario that includes significant renewable energy sources, and especially those that outpace the renewable energy policies set forth by the Minnesota legislature, will have significant negative consequences for Minnesota families and businesses that rely on affordable electricity. Xcel's carbon-reduction goals set forth its Preferred Plan (Scenario 9) are ambitious beyond what is required by Minnesota law, making the company's Preferred Plan unnecessarily expensive as a result. It should not be approved due to the cost burdens it would impose on its customers without a legislative mandate to do so.

3. **Xcel's Scenario 15 –** American Experiment believes replacing retiring coal facilities with intermittent wind and solar energy sources is not advisable due to their unreliability. However, Scenario 15 moves at the right pace for future technological advancements to facilitate an affordable, reliable, transition to carbon-free resources. This may come in the form of storage technologies that make renewables more reliable and affordable, or it may come in the form of competing technologies –such as small modular nuclear reactors— or carbon capture and storage that provide superior value to ratepayers.

   Furthermore, Scenario 15 will allow more time for Minnesota grid operators to understand how the state's evolving resource mix will impact the reliability of the electric system before statewide blackouts—like those experienced in California and Texas—become a reality. American Experiment therefore supports a modified version of Scenario 15, where coal plants are maintained through their original retirement dates, both nuclear facilities are extended, but Xcel does not build any wind or solar facilities that are not required to meet mandates under the Next Generation Energy Act or the Solar Energy Standard.

   Furthermore, we do not think that this decision needs to be made in during this IRP. The composition of the grid is changing rapidly as reliable, resilient power plants are being retired and replaced with intermittent generation resources. Similar transitions around the country and world have already resulted in rolling blackouts, such as in California and Southwest Power Pool, and the disastrous blackouts experienced in Texas. The most prudent course of action would be to reevaluate the fate of Sherco 3 and A.S. King in the next IRP to assess the impact of these unit retirements on the reliability of the regional grid.

4. **CEO's Preferred Plan –** The plan submitted by the Clean Energy Organization's (CEO) would result in an even faster transition toward renewable energy than Xcel is proposing with its Preferred Plan, and thus result in even higher expenses and reduced reliability. In addition, it would bring Xcel's electrical grid to the bare minimum reserve margin allowed by the Midcontinental Independent System Operator (MISO) of 3.46

percent. It does this by using questionable assumptions—such as unrealistic capacity factor assumptions for solar— that would devastate Minnesota's electrical grid with statewide blackouts and making load management a necessity to meet peak load rather than a benefit of reducing peak load.

5. **The Need for Reliability –** American Experiment's initial filing shows that Minnesota can achieve similar carbon reduction goals as Xcel's and CEO's preferred plans at a fraction of the cost by maintaining existing natural gas facilities and building new natural gas and nuclear power plants to replace retiring coal plants. Additionally, our plan would maintain reliability on the system by utilizing dispatchable clean energy resources, as opposed to intermittent renewables like wind and solar. We ask the PUC to consider technologies – such as small modular reactors – that can be implemented in Minnesota more affordably than wind and solar without resulting in significant reliability concerns before approving Xcel's Preferred Plan.

6. **Becker Natural Gas Plant –** As mentioned above, American Experiment believes Xcel should keep its coal plants open at least until the end of their useful lives. However, if coal facilities are forced to retire, wind and solar resources combined with battery storage systems do not have the ability to replace the loss of baseload capacity. A baseload energy source, such as natural gas or nuclear, is required to keep the lights on for millions of Minnesota homes and businesses. Additionally, it is highly beneficial to locate these new natural gas or nuclear facilities at or near the retired coal facilities to utilize existing infrastructure, such as transmission lines that would cost millions of dollars to replace if located elsewhere, as well as to maintain the economic backbone that these communities have come to rely upon.

   It has been brought to our attention that Xcel Energy may be reconsidering whether to build the nearly 800 megawatts (MW) combined-cycle natural gas plant (Sherco CC) in Becker, Minnesota, and may instead build two smaller plants in Lyon County, MN, and one "near the North Dakota border."

   If Xcel no longer intends to proceed with a Sherco CC unit, or has modeled a scenario without the Sherco CC unit for purposes of developing an alternative plan, American Experiment concurs with Xcel Large Industrials that the following information should be provided:

   A. Please provide a list of assumptions or alternatives being considered or studied.

   B. For each of the assumptions or alternatives outlined in subpart a above, provide the old assumptions/alternatives and the new assumptions/alternatives and provide a

complete narrative description of the reasons for the modeling changes under consideration.

C. For any modeling updates, provide all modeling analyses performed by the Company, including any EnCompass or other production cost modeling runs or excel workbooks created, with all formulae intact.

D. For any alternative modeling performed, please provide cost estimates, including projected rate impacts for each customer class.

American Experiment asks the Minnesota PUC to consider our position to utilize all facilities – including but not limited to coal plants – until the end of their useful lives in order to give Minnesota ratepayers the opportunity to fully benefit from their investments, understanding that hardly any ratepayer investments for new capacity would be needed for years to come if not for allowing the premature retirement of coal facilities.

We strongly believe that this is the only strategy that keeps cost low for Xcel customers, who, as our initial filing shows, are already paying significantly higher rates than the national average. This is especially true for Xcel's industrial customers, who pay rates more than 17 percent higher than the national average.

Sherco Unit 3 and Allen S. King Should Remain Open Until the End of Their Useful Lives

According to Xcel's remaining life schedules, Sherco Unit 3 and Allen S. King are useful until 2036 and 2038, respectively. However, in Xcel's latest IRP, the utility is requesting to retire these facilities prematurely by up to ten years – Sherco Unit 3 in 2030, and Allen S. King in 2028.

Retiring these facilities early would prematurely shut down two sources of reliable, low-cost electricity that would benefit ratepayers by keeping electricity prices low and reducing their exposure to high natural gas prices on the spot market.

According to Federal Energy Regulatory Commission (FERC) data for 2019, Sherco and Allen S. King provided electricity at $31.30 and $46.67 per megawatt-hour (MWh) in that year, respectively. Notably, the cost of Allen S. King is so high because of recent upgrades, and its lack of utilization, as its capacity factor has dropped from over 55 percent in 2017, when it provided electricity at $36.83 per MWh, to just 33 percent in 2019.

These coal facilities are still able to provide Minnesotans with affordable and reliable electricity for years to come. Retiring them early would be unjustly and unreasonably robbing Minnesota families and businesses the significant cost savings that they deserve.

Retiring these facilities will also make large natural gas price spikes for residential customers more frequent by increasing the demand for natural gas during extreme winter weather events if wind and solar are producing minimal quantities of electricity.

Such an event happened in February of 2021, and resulted in CenterPoint Energy, the largest natural gas supplier in Minnesota, saying it would need to charge its customer an additional $300 to $400 on average due to surging natural gas spot prices.

It makes little sense for the PUC to gnash their teeth about these additional charges if they are approving resource plans that essentially guarantee that these events will become more likely to occur in the future. A reliable grid with a diversity of fuel supplies—including coal and nuclear power— is essential to keep both electricity rates and home heating costs as low as possible.

Minnesota Does not Need to Move as Fast as Xcel's Preferred Plan (Scenario 9)

As noted by other stakeholders, all 15 scenarios modeled by Xcel would meet Minnesota's goal of reducing emissions by 30 percent by 2025 and 80 percent by 2050.[3] In fact, all 15 scenarios reduce emissions by 70 percent by 2030, far beyond the reduction schedule laid out by the state legislature.[4] This includes Scenario 15, that does not approve early retirements for Sherco Unit 3 and Allen S. King.

Only two scenarios modeled by Xcel meet the company's internal goal of reducing emissions by 80 percent by 2030 – twenty years earlier than the state's goal. Xcel's Preferred Plan is one of those two scenarios.

[3] Xcel Large Industrial, "XLI Comment," February 11, 2021, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={00289377-0000-CA31-A9E5-A6A703BE7B3D}&documentTitle=20212-170891-02

[4] Xcel Large Industrial, "XLI Comment," February 11, 2021, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={00289377-0000-CA31-A9E5-A6A703BE7B3D}&documentTitle=20212-170891-02

Xcel customers have already experienced negative impacts as Xcel has grown its fleet of wind turbines and solar panels, as shown by Figure 2 below.

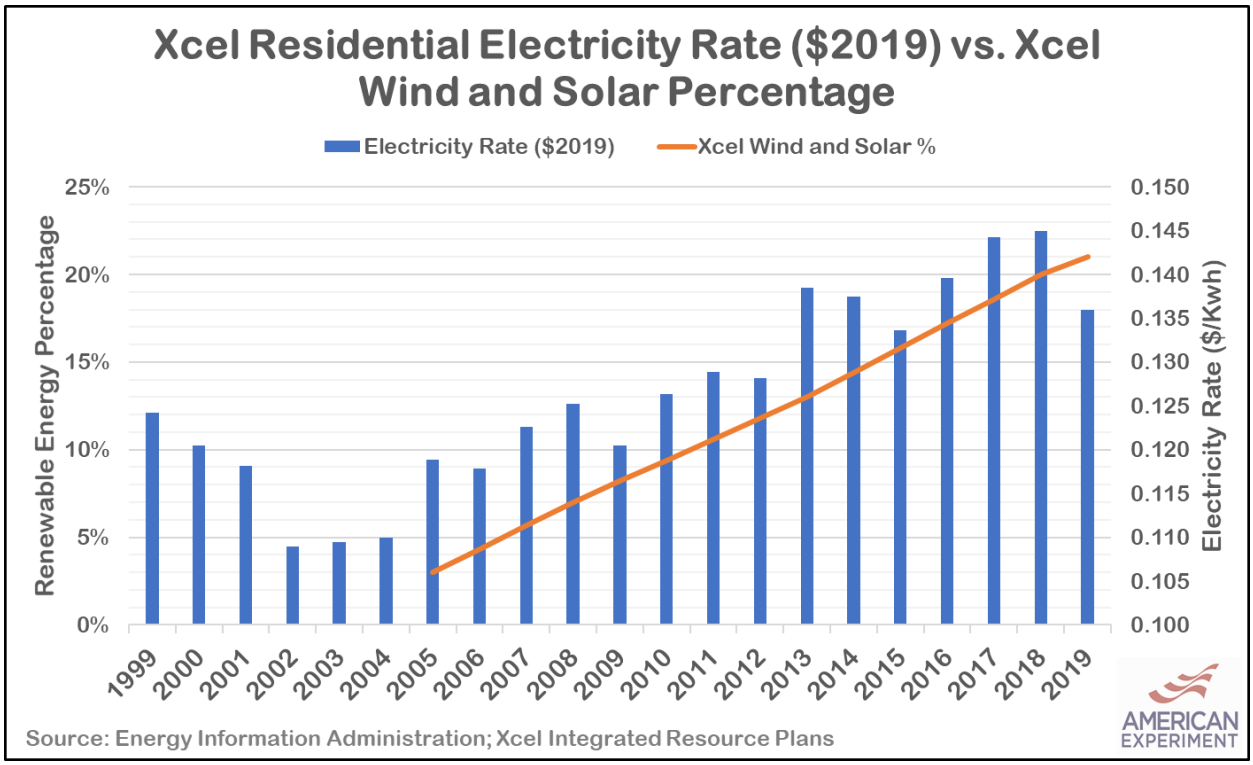

Figure 2. Increasing electricity rates at Xcel compared to the rise of wind and solar as a percentage of Xcel's total generation. Data points for wind and solar percentages are interpolated between data provided in Xcel Integrated Resource Plans.

Notice that in the years prior to Xcel investing heavily in renewable energy sources, residential electricity rates were decreasing. After renewable energy sources began ramping up after 2004, Xcel's residential electricity rates have increased by nearly 70 percent.

By choosing Scenario 9 as its Preferred Plan, Xcel is asking the PUC to approve even larger cost increases on Xcel's customers in the name of achieving an internal company goal, rather than fulfilling state goals of having electric rates 5 percent below the national average for all rate classes. If Xcel customers were free to approve or disapprove of Xcel's internal company goal by switching providers, this would hardly be an issue.

However, because Xcel customers in Minnesota are forced to purchase electricity from Xcel, the PUC should balance the company's push for renewable energy with the need for keeping electricity rates competitive with the national average. As it stands now, electricity rates at Xcel are now 4 percent higher than the national average, after increasing by 93 percent – nearly double the rate of the national average at 48 percent (See Figure 3).

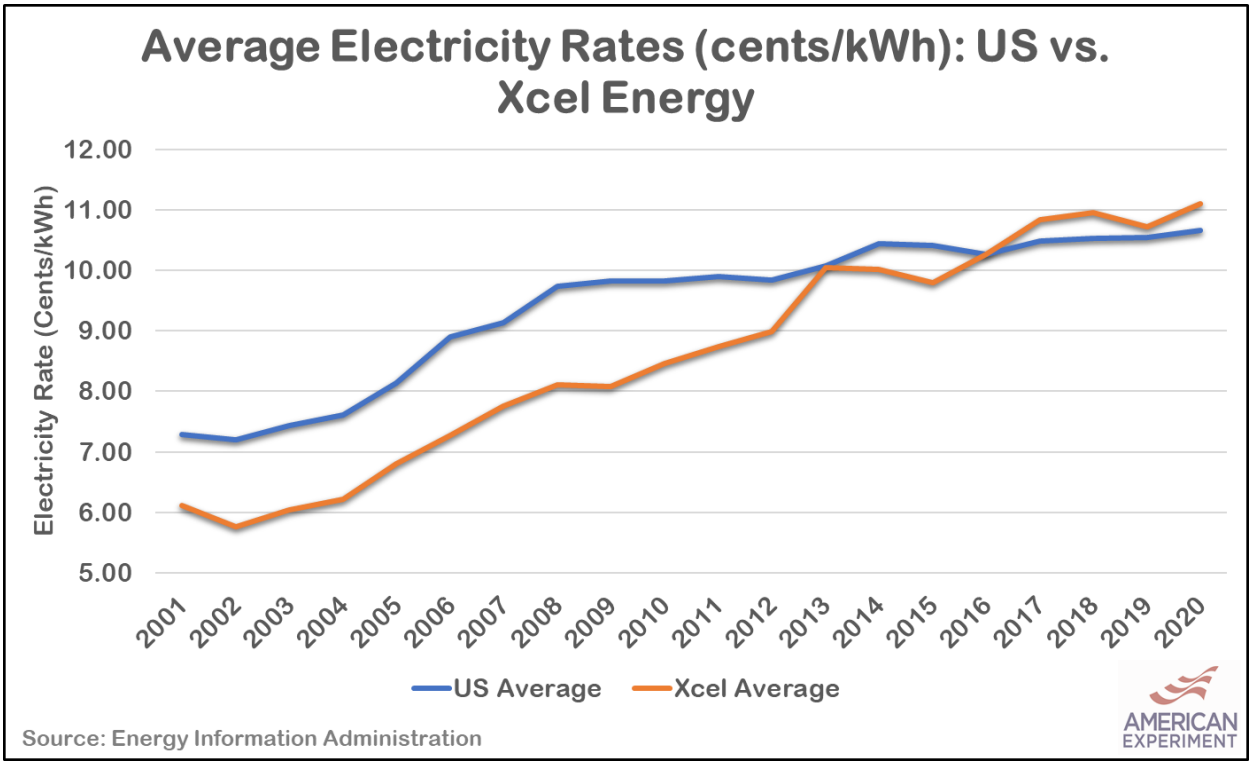

Figure 3. Average electricity rates for Xcel and the U.S. Since 2001, Xcel has eroded its price advantage with the national average, which once stood as high as 20 percent lower in 2002.

It is important to note that Figure 3 does not consider the 20 percent rate increase that Xcel is proposing over three years, which would further increase Xcel residential rates relative to the national average.

As we state in our initial filing, Xcel's Preferred Plan would continue these cost increases into the future. As Figure 4 shows, residential electricity rates will reach as high as 24.20 cents per kilowatt-hour (kWh) by the end of the IRP planning period in 2034. This is in the absence of future IRP's, which will likely increase costs even further extending to the future.

The members of the PUC should consider only the most affordable plan for Xcel's future that meets the energy policies and goals laid out by the Minnesota legislature – not Xcel's internal company goals. Xcel customers, who have no choice but to purchase electricity from Xcel, should not be forced to pay for the costs incurred to meet these goals.

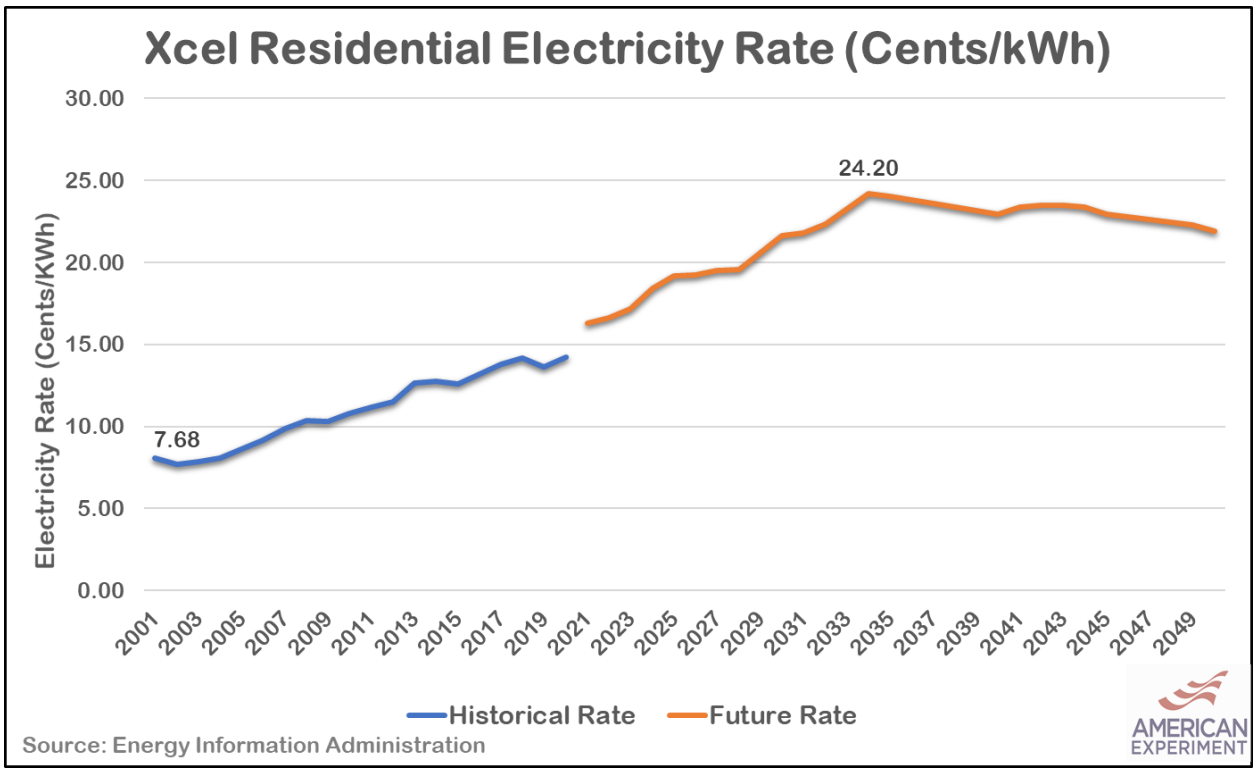

Figure 4. Future increase of residential electricity rates based on modeling performed by Center of the American Experiment.

If the PUC allows Xcel to shape the price of electricity based on internal company goals, rather than Minnesota legislation, affordability, and reliability, then it should also give Xcel customers the freedom to choose whether they wish to continue purchasing electricity from Xcel.

Xcel's Scenario 15

While all scenario's modeled by Xcel move at a faster pace than what Minnesota law requires, Scenario 15 moves at a slow enough pace that it will allow flexibility in the future to make decisions with the best-available information.

Simply put, renewable energy sources and battery storage facilities are not technologically ready to replace coal facilities and act as baseload power producers—and they are unlikely to be ready by 2030.

Research from Wood Mackenzie estimates global battery storage capacity will reach 741-gigawatt hours (GWh) by 2030. 741 GWh is the equivalent of 741,000-megawatt-hours (MWh).[5]

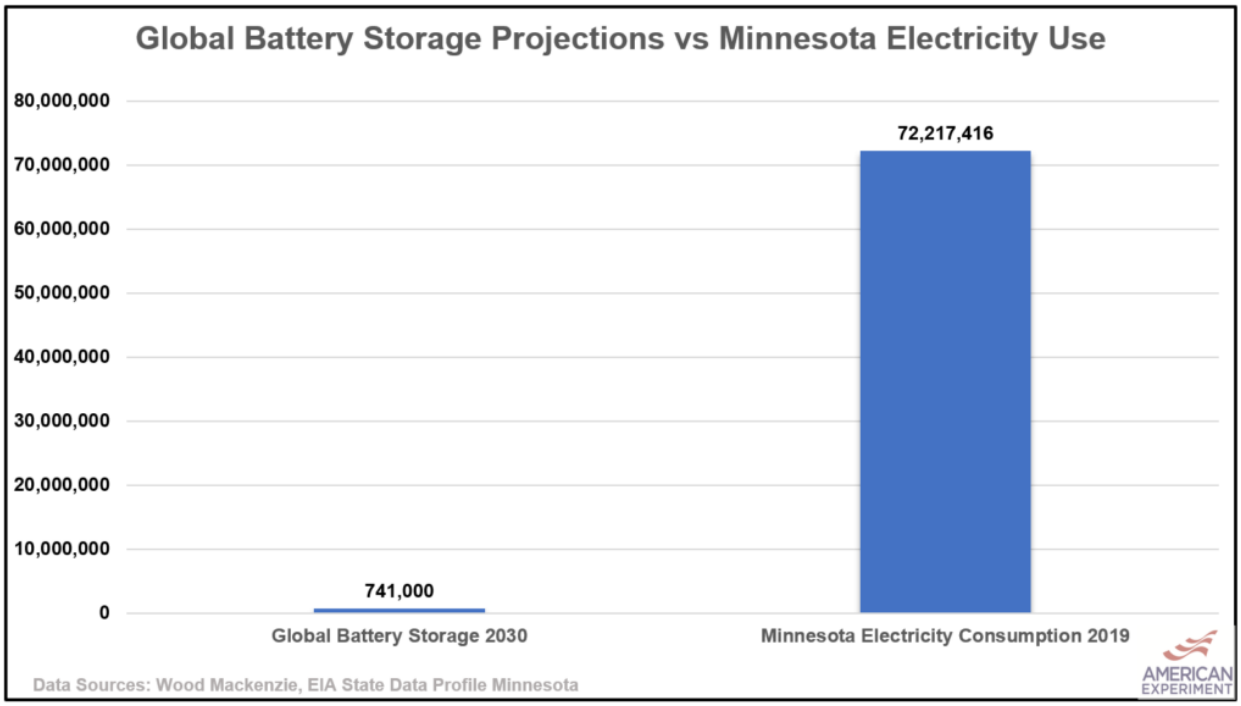

Figure 5. Amount of global energy storage in use by 2030 compared to 2019 Minnesota electricity consumption.

The problem is Minnesota consumed a total of 72 million MWh in 2019, including imports, meaning the global projections for storage capacity by Wood Mackenzie would be able to satisfy just 1 percent of Minnesota's annual electricity needs. Even if this estimate is off by a factor of ten or one hundred, there simply will not be enough batteries to store electricity generated by wind and solar to adequately provide reliable electricity for Minnesotans.

The other impediment to battery storage is cost. The current cost estimate for lithium-ion battery storage is about $250/kWh of storage capacity. This means that the cost of supplying one percent of Minnesota's electricity needs with battery storage would be more than $185 billion.

Additional challenges arise because battery technologies have different attributes than spinning generators. Indeed, Xcel notes that "Reliably meeting real-time operational demands will

[5] McCarthy, Rory, "WoodMac: Global Energy Storage Capacity to Hit 741GWh by 2030," Green Tech Media, September 30, 2020, https://www.greentechmedia.com/articles/read/woodmac-global-storage-to-reach-741-gigawatt-hours-by-2030

become more challenging than they have been in the past as dispatchable resources are retired and their corresponding ancillary services are lost."[6]

These ancillary services include power deliverability, dynamic stability, fault current, black start capability, voltage support, and system regulation, which are necessary features of the grid that are provided by dispatchable energy sources, and not wind or solar.[7]

Technological advancements are not out of the question in the future to mitigate these concerns, but in the meantime, it would be inappropriate and irresponsible to approve an "all in" commitment on behalf of Xcel to rely on intermittent, non-dispatchable renewable energy sources when these resources are not yet ready to handle peak demand in Minnesota. As stated by Xcel regarding the retirement of dispatchable facilities, "In the future, technology advances will be required so that non-dispatchable resources can provide the necessary capabilities when they are producing energy or, as an alternative, new technologies will need to provide the required ancillary services."[8]

Additionally, an overreliance on non-dispatchable wind and solar technologies have contributed to capacity shortfalls that resulted in blackouts in the cases of California, Texas, Southwest Power Pool, South Australia, and others.

Minnesotans require always available, affordable electricity to run their lives and their businesses. Xcel admits that, based on current technologies, it cannot run its system using wind and solar electricity alone and that future developments would be required.

Scenario 15 allows Xcel's coal facilities to remain open closer to the end of their useful lives and extends operation at both of Xcel's nuclear facilities, Monticello and Prairie Island. American Experiment supports relicensing these facilities because doing so will keep electricity rates at Xcel lower and more competitive with the national average. Scenario 15 will also give Xcel more time to evaluate alternative carbon-free technologies like small modular nuclear reactors and

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[6] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

[7] Xcel Energy, "Attachment J1: Baseload Study," Docket No. E002/RP-19-368, July 01, 2019, www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={10FBAE6B-0000-C040-8C1D-CC55491FE76D}&documentTitle=20197-154051-03

[8] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

carbon capture and sequestration, or revisit battery advances at a later time when the technologies are more mature.

CEO's Preferred Plan

The proposed plan by Clean Energy Organizations (CEO) has many similarities with Xcel's but differs in a at least one critical way. The main disagreement between the two stems from Xcel's "Proposed Gas Plant," which Xcel argues is necessary in 2027 to maintain a reliable system as they begin retiring coal plants early.

The CEO groups oppose the new natural gas plant. They argue that "the Proposed Gas Plant does not solve any valid reliability issues stemming from coal plant retirements."[9] Instead, they argue that a mixture of solar, wind, and battery storage would be a better investment for Minnesota ratepayers. CEOs note that "at the very least" the PUC should "modify Xcel's Preferred Plan to exclude the Proposed Gas Plant."[10]

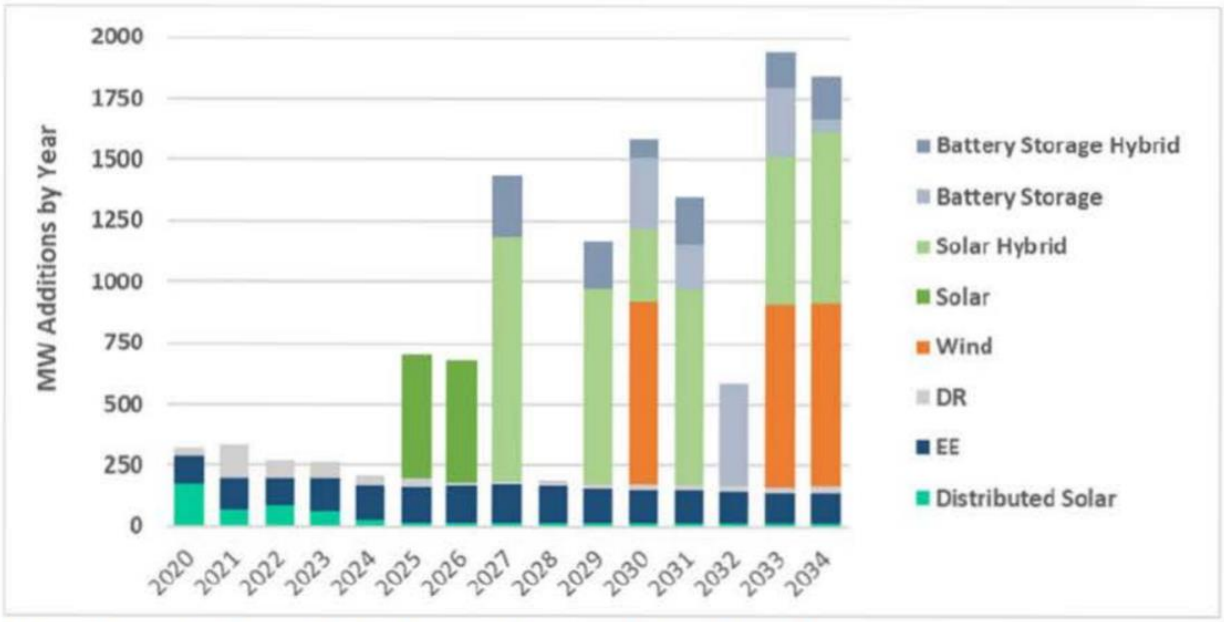

Figure 5. CEO Preferred Plan Annual Capacity Expansion Plan

Figure 6. Graph from CEOs filing showing annual capacity additions for CEOs Preferred Plan through 2034.

Similar to Xcel, the CEOs want to see an increased penetration of renewable energy sources on Xcel's grid. However, the CEOs are calling on the PUC to go even further than Xcel's plan in

[9]Clean Energy Organizations, "Clean Energy Organizations' Initial Comments," February 11, 2021, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={D0609377-0000-C05D-BB00-999BABB0F3BF}&documentTitle=20212-170901-03

[10] Clean Energy Organizations, "Clean Energy Organizations' Initial Comments," February 11, 2021, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={D0609377-0000-C05D-BB00-999BABB0F3BF}&documentTitle=20212-170901-03

terms of building new renewable and battery energy sources. Rather than installing over 8,350 MW of new wind, solar, and likely combustion turbine (CT) natural gas capacity from 2020-2034, as Xcel's plan currently does, the CEOs plan would introduce nearly 10,000 MW of new capacity from 2020 through 2034 and an additional 11,000 MW from 2034 through 2045 (not including energy efficiency or demand response).

Keep in mind that Xcel currently owns a little over 11,000 MW, not including power purchase agreements (PPA), which means the CEOs essentially want to build two more Xcel systems before 2050.

Despite building far more additional capacity than Xcel's plan, the CEOs claim that their plan is less expensive. However, upon analyzing the CEOs plan, they were only able to achieve this result after tweaking their assumptions to fit their desired outcome. Here are some of the significant changes made by CEOs that decreased the cost of running their models and allowed them to omit new natural gas facilities from their preferred plan:

1. **Solar Capacity Factors:** The CEOs increased the capacity factor of new solar projects from 17.7 percent to 25.5 percent based on irradiance data and NREL average capacity factors. According to EIA data, solar energy in Minnesota had an average capacity factor of 17.3 percent in 2019, while Arizona, a state known for its abundance of solar energy, saw capacity factors of 28.2 percent. Increasing the capacity factor to 25.5 percent based on irradiance data and NREL average capacity factors, rather than the actual performance of solar panels in the region, is highly inappropriate. Solar technologies do not use 100 percent of available solar resources even at the beginning of their production lives, and production levels from solar panels degrade every year thereafter. Increasing solar capacity factors from 17.7 percent to 25.5 percent significantly reduced the cost of operating solar power in the state of Minnesota for CEOs plan, and contributes to the model selecting solar instead of natural gas. These capacity factors are unlikely to be realized in real-world applications, and therefore these assumptions present a flawed view of cost and reliability for the CEOs preferred plan.

2. **Lowered Interconnection Costs:** New wind and solar projects on the MISO grid are being delayed or canceled due to high interconnection costs and long wait times.[11] Despite this, the CEOs lowered interconnection costs in 2031 compared to Xcel's assumption in its IRP. They did this because they assumed that interconnection costs would remain high until 2030 and then drop thereafter. For example, Xcel accounted for

[11] Leiberman, Julie, "How Transmission Planning & Cost Allocation Processes Are Inhibiting Wind & Solar Development in SPP, MISO, & PJM," March 2021, https://www.eenews.net/assets/2021/03/29/document_ew_01.pdf

increased interconnection costs in its Supplement IRP by raising wind and solar interconnection costs from $400/kW and $140/kW, respectively, to $500/kW and 200/kW, respectively. The CEOs, however, reduced wind interconnection costs in 2031 to $200/kW – half of what Xcel had originally – and $100/kW for solar - $40/kW less than Xcel had originally. This lowered the cost of building new wind and solar facilities. However, the CEOs offered no convincing evidence to support these assumptions.

3. **Cost Decreases for Battery Technologies:** The CEOs used moderate cost curve assumptions from the National Renewable Energy Laboratory's (NREL) Annual Technology Baseline (ATB) that reduced battery storage costs by 62.5 percent from 2020 to 2051. Because much of battery storage capacity in the CEOs plan comes online later in the modeling (2040-2045), this capacity is added under the assumption of significant cost decreases in the future that may or may not materialize. As we have stated previously, going "all in" on any plan that relies on non-existent future technologies is irresponsible and potentially setting Minnesota's electrical grid up for failure.

And while these unrealistic assumptions alone artificially reduce the cost of operating the CEOs Preferred Plan comprising of wind, solar, and battery storage, the CEOs made even worse assumptions that would result in Minnesota making the same mistakes that led to massive and deadly blackouts in Texas.

Dangerously Reducing Reserve Margins

Xcel Energy is required by the regional grid operator to have at least a 3.46 percent reserve margin, which can be thought of as a system's "safety net." American Experiment acknowledges that too much reserve margin is expensive to maintain, but as we saw in Texas, a safety net that is too small, or inappropriately calculated, can quickly turn into deadly blackouts.

While the reserve margin does not say everything about the system's reliability, it does tell interested parties how much safety room the system has in the case that, for some reason, the peak demand on the system is higher than expected, or the amount of available electricity generating capacity is lower than expected.

In fact, these scenarios could both happen at the same time, as it did during the 2019 Polar Vortex in Minnesota when extreme cold temperatures sent electricity demand through the roof and wind and solar generation to the floor. Fortunately, Xcel weathered the storm without blackouts because Xcel's current reserve margin is sitting at 18.76 percent. Xcel's significant

reserve margin is high thanks to the company's existing coal, natural gas, and nuclear capacity that can currently produce up to 98 percent of net load on Xcel's system, based on the reliable contributions of these power facilities (See Figure 7).

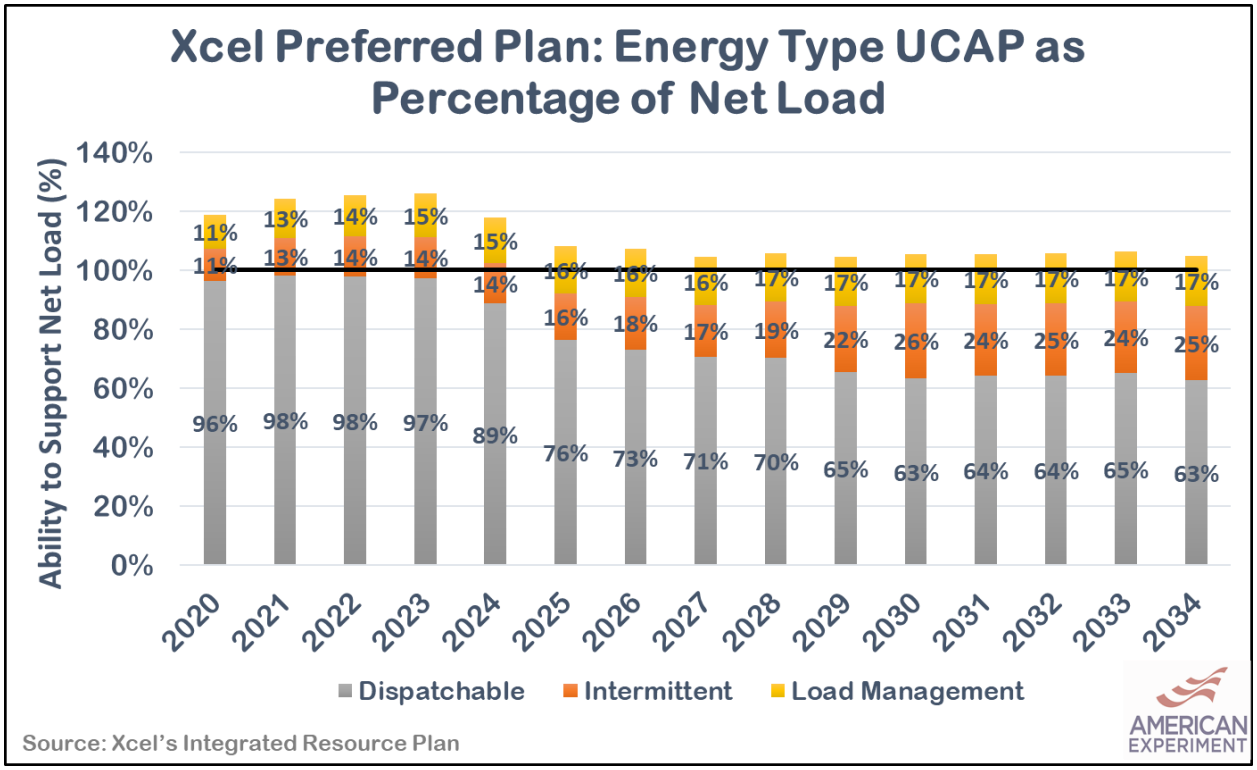

Figure 7. Percentage of net load that can be supported by dispatchable, intermittent, and load management resources in Xcel's Preferred Plan from 2020 to 2034.

By 2034, however, dispatchable resources would only have the ability to handle 63 percent of Xcel's net load. This constitutes an erosion of Xcel's reserve margin from 18.76 percent to 5.8 percent by 2028, eventually reaching 4.9 percent by 2034.

Figure 8 shows Xcel's planned reliable capacity compared to net load.

Alarmingly, Xcel is relying upon the accredited capacity of wind and solar to meet net load after 2024. This is irresponsible because, as we learned in California and Texas, accredited capacities for wind and solar generation are not guaranteed, and an overreliance on these technologies could result in capacity shortfalls.

As you can see, if renewable droughts occur similar to the one during January 22 to January 31, 2020, Xcel will not have enough firm capacity on the system to support net load after 2024.

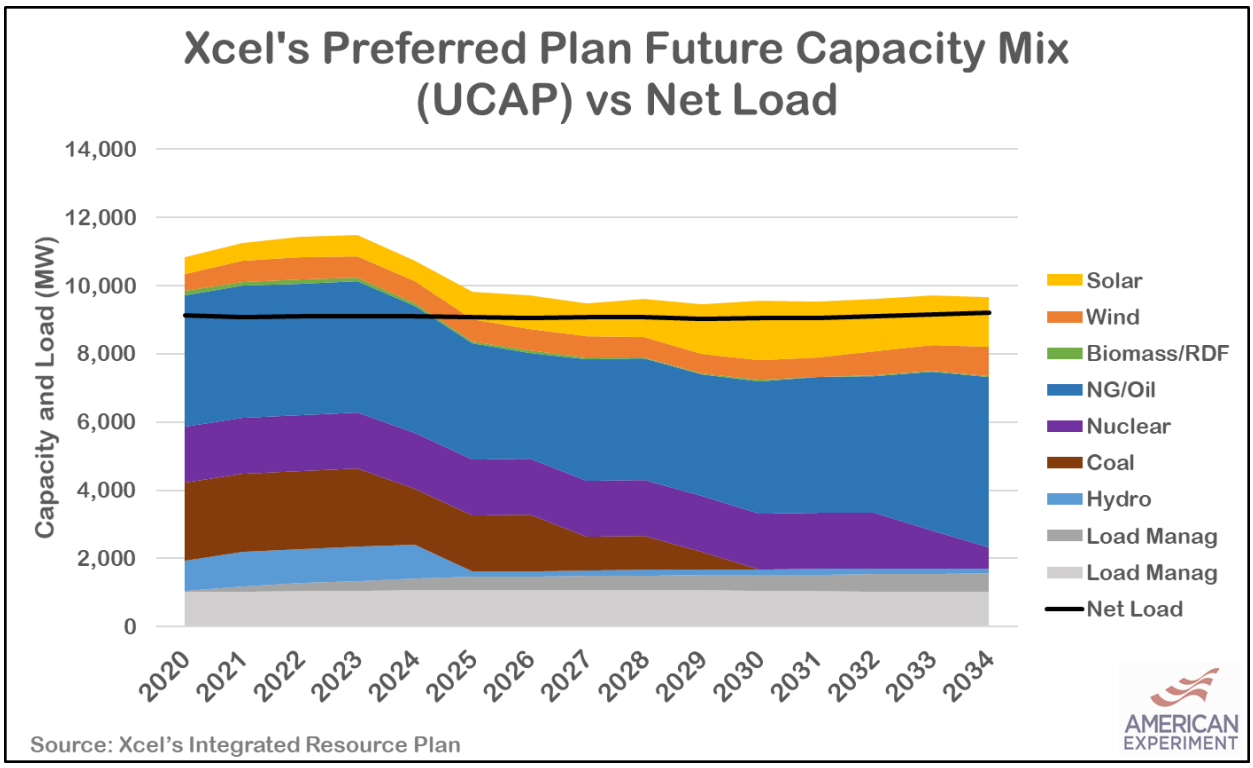

Figure 8. Reliable capacity on Xcel's system based on Xcel's Preferred Plan from 2020 to 2034.

Xcel's reserve margins are dwindling because maintaining an adequate safety net with wind and solar is extremely expensive due to their lower accredited capacity. For example, to match the accredited capacity of a coal plant with wind, Xcel would need nearly six times the amount of wind capacity. This is exemplified by Figure 9, showing that as Xcel's UCAP – the amount of reliable capacity on Xcel's system – goes down, *total* capacity goes up.

The fact that Xcel is building more *total* capacity only to reduce its total *reliable* capacity speaks volumes about why wind and solar energy are so much more expensive than dispatchable energy sources, no matter what the levelized cost of energy (LCOE) shows. On a system-wide basis, the most reliable energy sources, such as coal and nuclear provide significant cost savings by limiting the amount of capacity required by other less reliable technologies. This is because coal and nuclear receive reliability rates between 94 and 100 percent, while natural gas is in the 80 to 90 percent range and wind and solar are both below 50 percent.

Because maintaining reliability on the system becomes such a large expense, Xcel plans to offset costs stemming from massive renewable energy additions by skimping on safety.

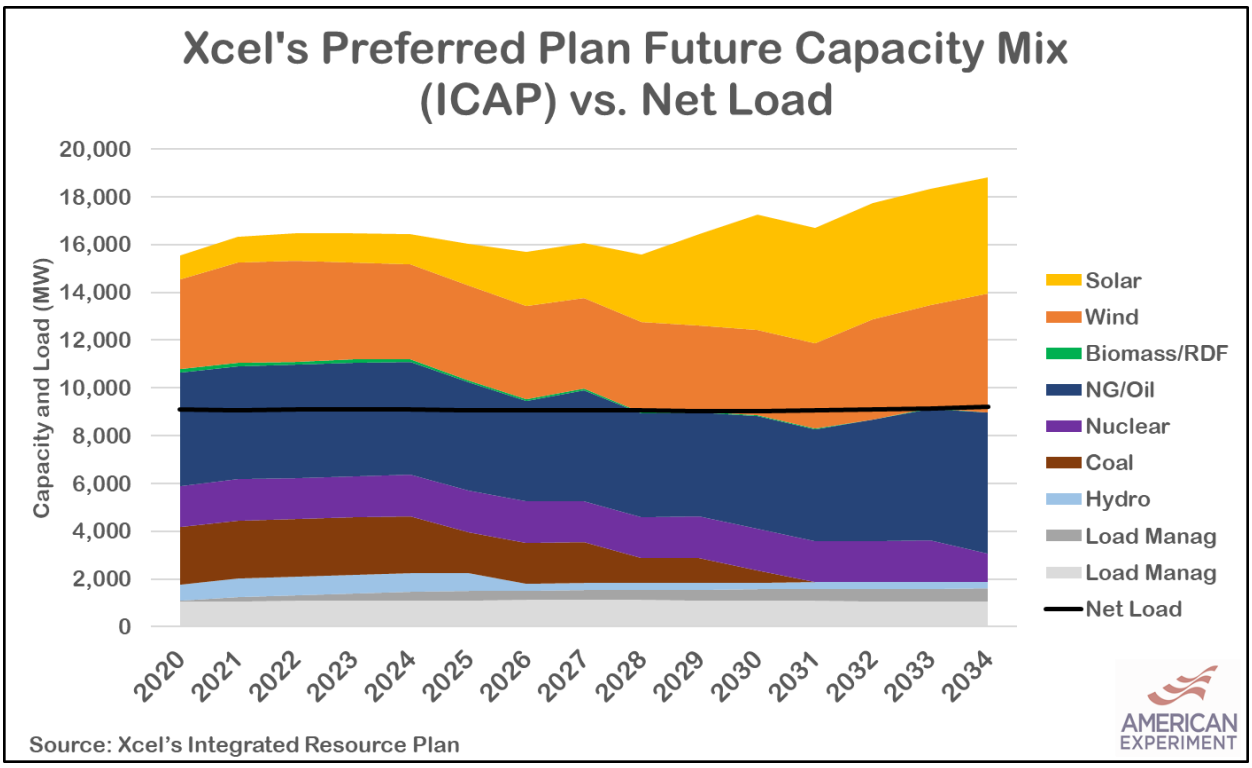

Figure 9. Total installed capacity (ICAP) on Xcel's system based on Xcel's Preferred Plan.

The CEOs compounded the problem by further reducing reserve margins. Under the CEOs plan, the reserve margin would be cut down to the slimmest possible margin of 3.46 percent, and only after increasing the amount of energy efficiency compared to Xcel's assumptions by an average of 6.75 percent annually.

What this does, in effect, is reduces the amount of electricity generating capacity that the CEOs needed to include in its plan to meet reserve margin requirements in the face of retiring coal facilities and the loss of capacity due to excluding Xcel's Proposed Gas Plant from their modeling.

For example, by applying Xcel's energy efficiency assumptions to the CEOs capacity additions, we see that the CEOs Preferred Plan would amount to a 2.8-2.9 percent reserve margin from 2029 through 2034. In other words, they are burning the reliability candle at both ends.

Figure 10 shows just how close CEOs Preferred Plan is cutting the reserve margin. As you can see, compared to Xcel's plan, battery storage almost exclusively covers for the natural gas capacity that is excluded in the CEOs Preferred Plan. Even so, the CEOs plan would require by 2034 that over 2,800 MW of wind and solar be operating at their accredited capacities by 2034 to meet net load, which is a very dangerous plan.

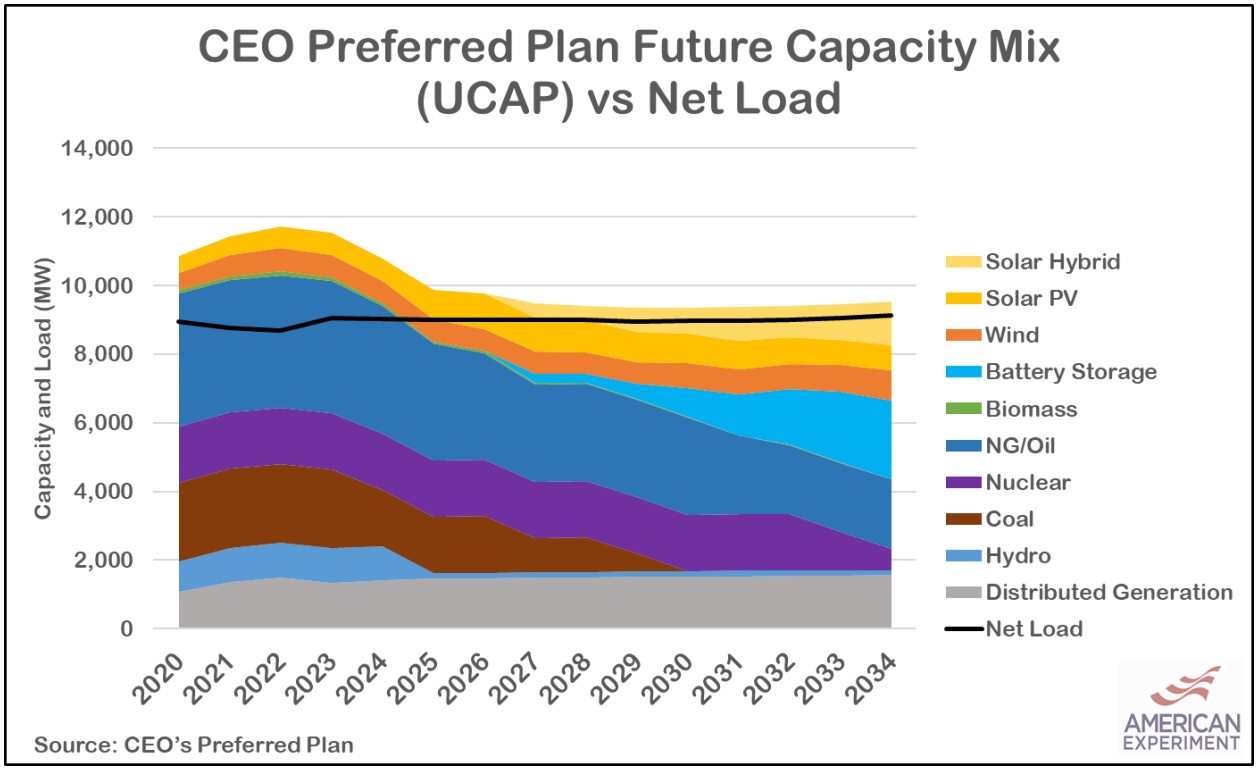

Figure 10. Reliable Capacity (UCAP) on Xcel's system based on CEOs Preferred Plan from 2020 to 2034.

While battery storage is technically "firm" capacity and receives a 100 percent effective load carrying capability (ELCC) from Xcel, it is only as firm as it is charged. In the words of Xcel, "the value of storage to the transmission system is limited if there is inadequate energy to recharge the devices."[12]

Reliability concerns arise when the over 2,800 MW of wind and solar capacity in the CEOs Preferred Plan isn't operating during record low temperatures because of low wind speeds and no sunshine.

Indeed, Xcel has historically experienced days where renewables were essentially unavailable for stretches of 16+ hours, as was the case on February 5, 2019.[13] The wind and solar output for this day is displayed in Figure 11.

[12] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01.

[13] Xcel Energy, "Appendix G1: Demand Side Management," 2020-2034 Upper Midwest Integrated Resource Plan, June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={10FBAE6B-0000-C040-8C1D-CC55491FE76D}&documentTitle=20197-154051-03.

Table 1: Hourly Wind and Solar Capacity Factors
February 5, 2019

Hour Ending	Wind Capacity Factor	Solar Capacity Factor
1	9%	0%
2	9%	0%
3	6%	0%
4	5%	0%
5	7%	0%
6	6%	0%
7	7%	0%
8	4%	0%
9	3%	0%
10	3%	3%
11	2%	6%
12	3%	6%
13	3%	5%
14	7%	5%
15	12%	4%
16	13%	2%
17	11%	1%
18	11%	0%
19	9%	0%
20	6%	0%
21	5%	0%
22	4%	0%
23	3%	0%
24	4%	0%

Figure 11. Hourly wind and solar capacity factors during February 5, 2019.

Additionally, Xcel provides the graph shown in Figure 12, detailing a multi-day renewable drought from January 22 to January 31, 2020. From January 27 to January 30 essentially no renewable electricity was being generated, and net load and total load were nearly identical for 72 hours.

The major question regarding the CEOs plan is what energy source, exactly, is going to charge the battery storage during periods when wind and solar are hardly producing any electricity? Even if battery storage technology had 8-hour duration times, Minnesota would need at least double the battery storage capacity to keep the lights on when wind and solar energy sources do not provide sufficient electricity for 16+ hours. Furthermore, batteries would need to be "overbuilt" by a factor of nine to act as a baseload energy source during a three-day wind and solar "drought," similar to the one experienced just last year.

Figure VI-4: Xcel Energy Upper Midwest Net Load During a Multi-Day Renewable Drought – January 22-31, 2020

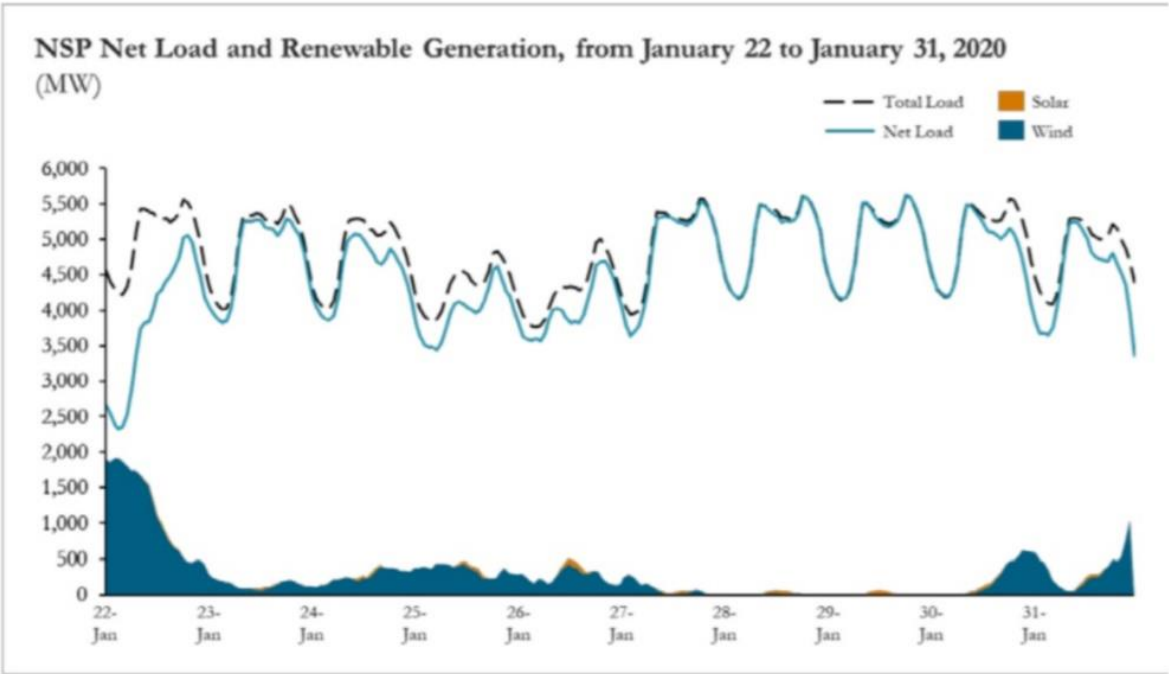

Figure 12. Total Load (demand) vs. Net Load (total load minus renewable generation) from January 22 to January 31, 2020. From the middle of the day on January 27, to the middle of the day January 30, wind and solar generation was essentially non-existent, as net load was identical to total load for most of the period.

This is truly the Texas plan for Minnesota.

In February 2021, most of Texas was plunged into a multi-day blackout due to a polar vortex that limited natural gas, wind, and solar generation. These electricity shortages resulted from bad public policies, as identified by the Texas Public Policy Foundation, a nonprofit think tank in Texas: [14]

While Texas attempts to identify the causes of the tragic blackouts this week and the sources of mismanagement, it's clear that poor policy decisions are the root of the problem. Texas has lost significant fossil fuel generation capacity over the past several years and instead counted on nearly 20,000 MW of new wind and solar generation to satisfy steadily rising electricity demand. It has been known for years that a weather event combining low wind and solar

[14] Isaac, Jason and Roberts, Kevin, "Correcting the Record: Why Texas' Blackouts Occurred," Life:Powered, February 16, 2021, https://lifepowered.org/correcting-the-record-why-texas-blackouts-occurred/?utm_campaign=L:P%20Newsletter&utm_medium=email&_hsmi=111836471&_hsenc=p2ANqtz-8xg8ZvLcXgfgTdkf1Alg38JsAmJ4Z0AzqrOjLUdhUh3kppJGWzrWBrrH_EZi6XuJQgGw0xTE6raOKfHYi1QJdf7ZARCnibBZwYlhsUQgfVLNFqklo&utm_content=111836471&utm_source=hs_email.

production and record demand could lead to blackouts. This week, that event became reality as new wind and solar generation failed to produce when it was needed the most.

As temperatures dropped further Sunday night and electricity demand started rising, wind generation also began to drop, eventually bottoming out at 2 percent of installed capacity last night. Preliminary data indicates conservation measures and rolling outages were not initiated quickly enough. Contrary to numerous false reports that coal and natural gas plants were also "frozen," almost all those reliable generators were operating without interruption until this system failure, just as they do in much colder climates all over the world.

Interestingly, grid operators in Texas at the Electric Reliability Council of Texas (ERCOT) predicted a reserve margin of 43 percent in the winter of 2020-21.[15] Because a significant portion of this margin was made up by wind energy, and wind energy was a no-show during the Polar Vortex that saw electricity demand skyrocket in the state, Texas was left without enough electric generating capacity to keep the lights on. So, while wind energy may have outperformed day-ahead forecasts, as was often touted in the aftermath of the blackouts, they vastly underperformed reliability forecasts that the ERCOT uses to calculate whether there will be enough capacity to meet peak load at all times.

This should be an enormous warning sign of *what not to do.* Instead, it appears to be the exact template that the CEOs have laid out for Minnesota's largest utility company. The only difference is that Xcel isn't an isolated grid – unlike ERCOT – and can somewhat rely upon on the charitable imports from other areas across the regional electric grid. Thus, CEOs plan would have Minnesota become even less energy-independent than it already is.

It would be a mistake, however, to assume that these imports will always be available. During the same time power outages were happening across Texas, MISO was initiating rolling power outages in its Southern regions, and "load shedding events" affect the entirety of the Southwest Power Pool.[16] There were simply not enough imports to meet demand.[17]

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[15] ERCOT, "Seasonal Assessment of Resource Adequacy for the ERCOT Region (SARA) Winter 2020/21," November 5, 2020, http://www.ercot.com/content/wcm/lists/197378/SARA-FinalWinter2020-2021.pdf.

[16] MISO, "Winter Weather Causes Forced Outages in Parts of MISO's South Region," February 15, 2021, https://www.misoenergy.org/about/media-center/miso-load-demand-reaches-an-all-time-high-in-western-south-region/.

[17] MISO, "Overview of February 2021 Arctic Weather," Markets Subcommittee, March 11, 2021, https://cdn.misoenergy.org/20210311%20MSC%20Item%2004%20Max%20Gen%20Feb%2015530356.pdf.

Plans like those put forward by the CEO's would impose a reliability penalty on all of MISO by advocating for the closure of reliable, dispatchable sources of electricity and promoting a misguided faith in the availability of market imports to meet demand.

As stated by Xcel, "the extent to which we rely on the market to provide energy at the time we need it introduces a risk tradeoff that must be considered."[18] Continuing, Xcel noted that imports and market purchases "are considered non-firm and as such, are not dedicated and guaranteed to serve our system at any time needed."

By advocating for Xcel to rely on significant electricity imports, the plan laid out by the CEOs is one that would set Minnesota on a collision course with blackouts in the near future. In fact, , while Xcel expects only 9 high-import hours for its preferred plan, the CEO plan would require 153 "high import" hours to meet demand, 1,611 percent higher than Xcel's (See Figure 13).[19]

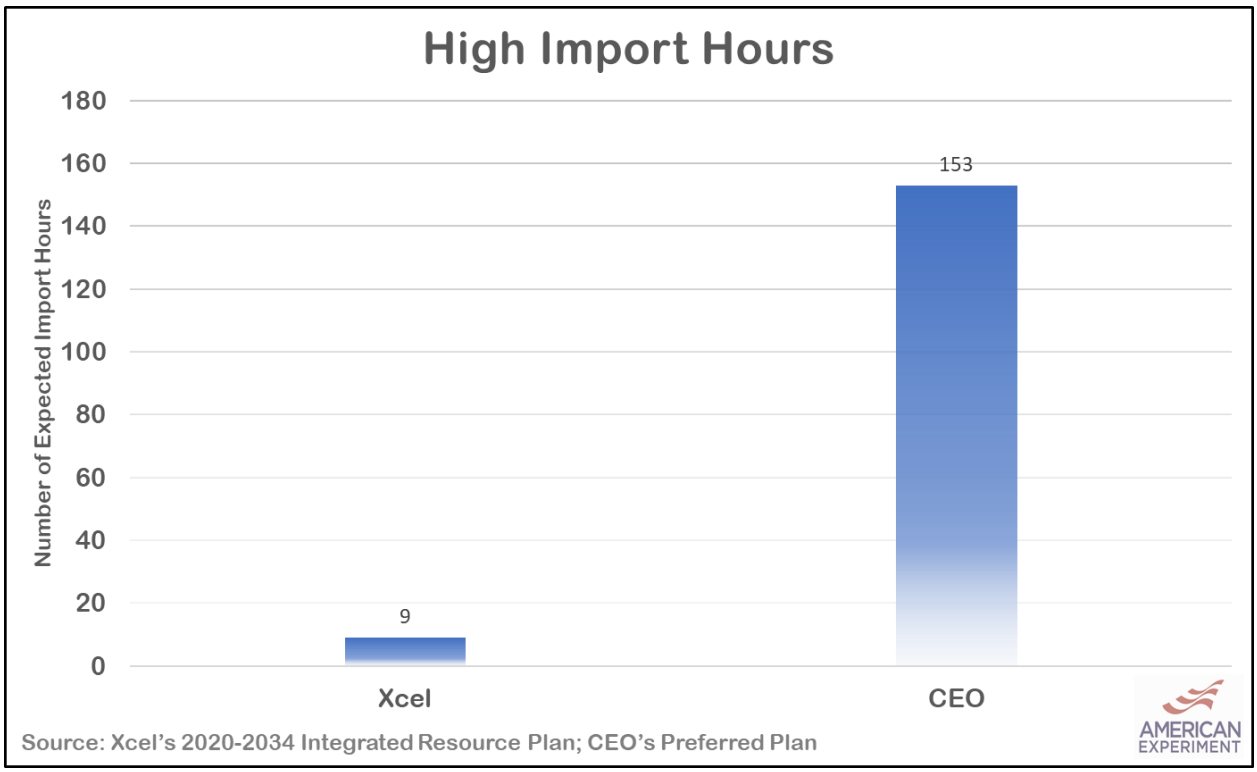

Figure 13. Number of expected "high import" hours from Xcel's and CEO's preferred plans.

[18] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

[19] Xcel Energy, "Attachment A: Supplement Details," 2020-2034 Upper Midwest Integrated Resource Plan, June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

Not Less Expensive: Less Reliable and More Exposure to Imports

The proposed plans of both Xcel and the CEOs are not saving Minnesota ratepayers money by switching to renewable energy, but only appear cheaper because they destroy the safety net of available dispatchable capacity on the system (reliability) during extreme weather events when electricity is needed most.

As a result of both plans, Xcel would become even more reliant on MISO imports than it already is. Indeed, Xcel shows that under the company's Preferred Plan and based on 2019 test load and resource shapes, there would four native capacity shortfalls where Xcel would need to rely on high imports for up to two hours.[20]

While the company may be able to import electricity on MISO, these imports are not guaranteed – *especially* if other states belonging to MISO increase renewable generation levels in their states by 2034, as well, and "other load serving entities in our region similarly lean on the market" during hours of low renewable output, as Xcel stated.[21]

While wind and solar advocates assert that "the wind is always blowing somewhere," there are instances, as noted by Xcel in Appendix J of its IRP, where all 17,000 MW of wind capacity on MISO's grid –as of July 2018—produced minus 11 MW of electricity, meaning all 17,000 MW of wind capacity was using more power than it was contributing.[22] If not for dispatchable capacity remaining on the grid, MISO would have been in a world of trouble.

If Xcel's Preferred Plan is approved, Xcel would increasingly be at the mercy of MISO imports, which may or may not be there, because they lack sufficient dispatchable capacity on the system to support the grid. This is exactly why California suffered rolling blackouts in August of

[20] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

[21] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

[22] Xcel Energy, "Appendix G1: Demand Side Management," 2020-2034 Upper Midwest Integrated Resource Plan, June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={10FBAE6B-0000-C040-8C1D-CC55491FE76D}&documentTitle=20197-154051-03

2020, and why California is currently issuing "Flex Alerts," pleading with residents to reduce electricity consumption to prevent rolling blackouts from occurring again.[23]

As previously mentioned, Figure 7 shows that Xcel is currently able to support 98 percent of net load with dispatchable capacity resources, such as coal, nuclear, and natural gas. Under Xcel's preferred plan, this percentage would dip down to 63 percent in 2034, when load management would become a necessity to meet net load.

This is an irresponsible plan, but the state of the grid would be even worse under the CEOs plan, as Figure 14 shows. Dispatchable capacity would decrease to 30 percent by 2034, while battery storage would be relied upon to supply 25 percent of net load. The remaining load being met with load management (17 percent), and intermittent generators (31 percent).

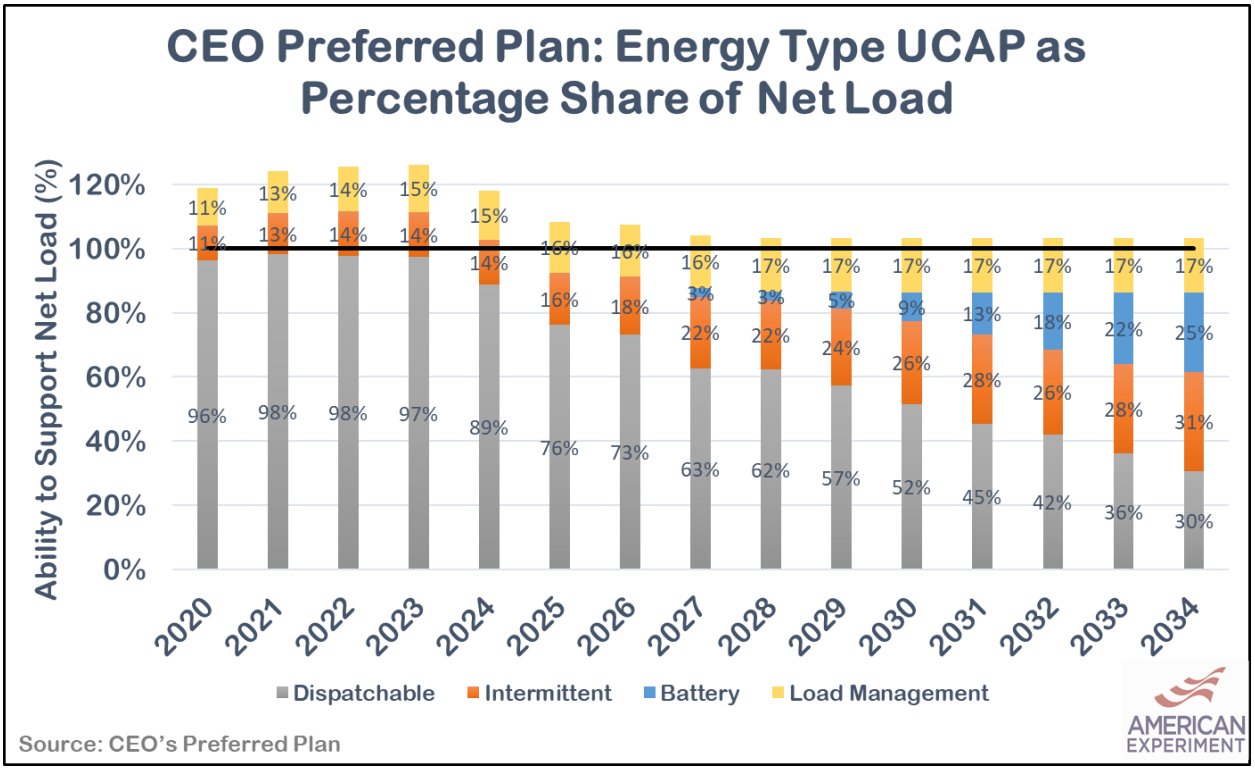

Figure 14. Percentage of net load that can be supported by dispatchable, intermittent, and load management resources in CEOs Preferred Plan from 2020 to 2034.

Furthermore, Xcel included Figure 15 in its analysis on Scenario 9 including a 50 percent ELCC, stating that it shows:

[23] California Independent System Operator, "California ISO Extends Flex Alert Through Friday," June 17, 2021, https://www.actionnewsnow.com/content/news/California-ISO-extends-flex-alert-through-Friday-574657801.html.

"[A]n example of a rapid change in net load (the solid red line) in a generation portfolio with high proportion of solar generation. Here, the generation output pattern for these days produce a rapid change in the amount of power generation from solar resources. Since solar comprises a large proportion of this capacity expansion plan, from 3:00 p.m. to 6:00 p.m. the net load changes very quickly; a 7,239 MW swing, in total. As seen in Figure XI-6, the Company would not – in this scenario –have enough firm dispatchable and fast-burst balancing capacity available in its portfolio to fully meet this rapid and large change in net load."

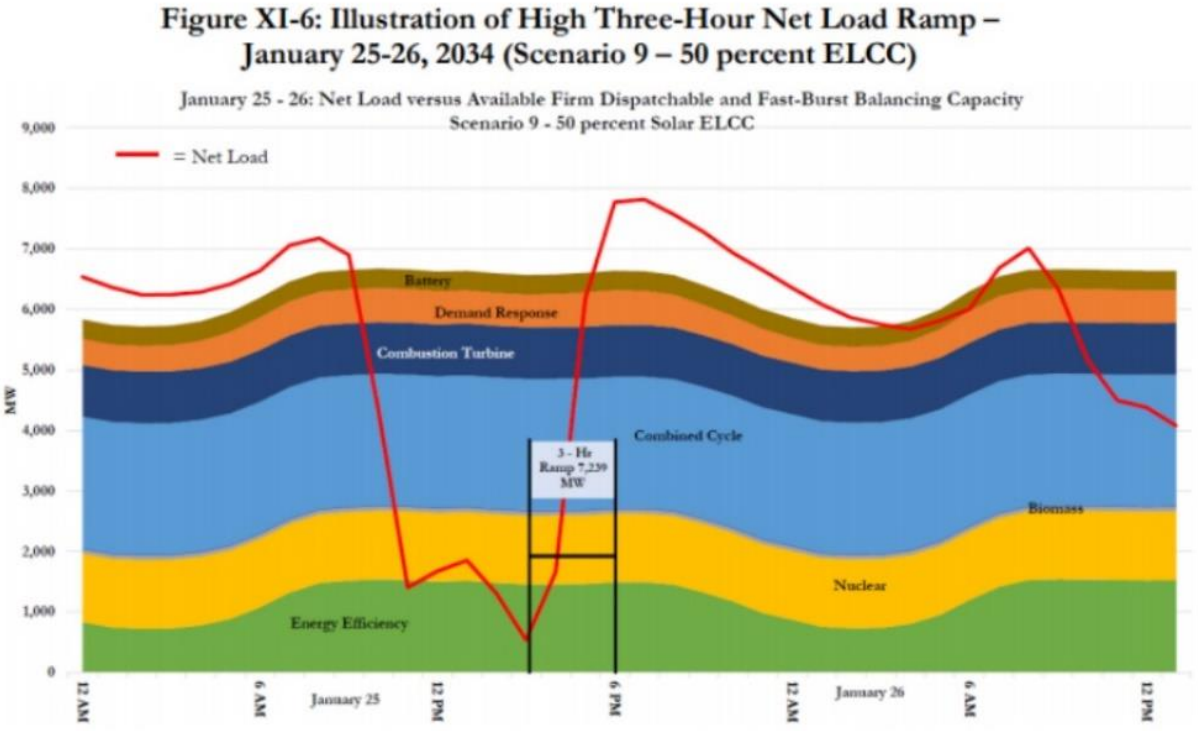

Figure 15. Graph from Xcel that shows a three-hour ramp of 7,239 MW on January 25, 2034.

The plan submitted by CEO would be worse, as it results in a maximum 3-hour upward ramp of 7,000 MW and would only have a total dispatchable capacity of just under 6,700 MW, including battery storage and demand response, a 300 MW gap.[24]

This, in the terms of Xcel, would "magnify the size of net load ramp beyond the amount of firm dispatchable and fast-burst balancing resource capacity, causing… native capacity shortfalls."[25]

[24] Energy Futures Group, "A Clean Energy Future for Xcel," February 2021, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={D0609377-0000-C49F-8DE4-F9CEA5162F84}&documentTitle=20212-170901-05

[25] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

In summary, CEOs plan is unserious and dangerous. It relies on unrealistic assumptions for solar capacity factors and energy efficiency programs to reduce peak load. It also reduces the reserve margin and relies upon unreliable intermittent wind and solar generators to produce at their accredited capacity to avoid capacity shortfalls, which is a dangerous assumption to make.

Lastly, the CEO's heavy reliance upon load management practices is an affront to modernity. We live in the year 2021. We put a man on the moon 52 years ago and we should be able to provide reliable, affordable electricity to homes and businesses at every hour of the day. Load management practices should only be used in the severest circumstances, and not viewed as a routine practice to meet net load.

The Need for Reliability

Reliability and affordability should be the two main focuses of Minnesota energy policy. At the bare minimum, Minnesotans should not be forced to use less electricity so that Xcel and other utilities meet demand, nor should they have to worry about receiving affordable electricity.

American Experiment's initial filing has already shown that the preferred plans laid out by Xcel does not keep electricity rates competitive with the national average, and the true cost of the CEO plan is impossible to accurately ascertain due to their reliance on battery cost assumptions for 2040.

Therefore, these plans would result in significant cost burdens for Xcel customers and continue the trend of Xcel's average electricity rates increasing 118 percent faster than the national average since 2002.

We have also shown that plans submitted by Xcel and the CEOs opt to erode the safety net of reliable power facilities on the system to keep costs in check on a grid that is highly reliant upon intermittent resources. This would make Xcel reliant upon higher amounts of electricity imports in the future.

In our initial filing, we detailed two scenarios in which Xcel maintains existing natural gas and hydro resources, builds new nuclear facilities to replace retiring coal facilities, and allows existing wind and solar resources to retire as they come to the end of their useful lives. These scenarios were labeled "Short Term Nuclear" and "Long Term Nuclear" based on different coal retirement schedules. The Short Term Nuclear scenario retired Xcel's remaining coal facilities early, similar to Xcel's Preferred Plan, while the Long Term Nuclear scenario keeps them open until the end of their useful lives. In both plans, the Sherco CC gas plant is not required to maintain reliability, as demonstrated below.

As stated in our initial filing, both nuclear plans are less expensive than Xcel's Preferred Plan – the Short Term Nuclear scenario by $13 billion and Long Term Nuclear scenario by $20 billion – and would bring Xcel's carbon-free percentage of generation to 89.5 percent by 2050. By utilizing *existing* nuclear technologies – without taking into account future cost decreases that could materialize – Xcel customers would save hundreds of dollars per year on average.

Furthermore, reliability is maintained under these nuclear scenarios by utilizing dispatchable resources, as opposed to intermittent resources, load management mechanisms, and imports that may or may not be there when Minnesotan's need them most.

As shown in Figure 16, the Long Term Nuclear scenario creates an energy grid that can supply 86 percent of net load with dispatchable energy sources by 2034, while simultaneously increasing Xcel's carbon-free percentage to 74 percent.

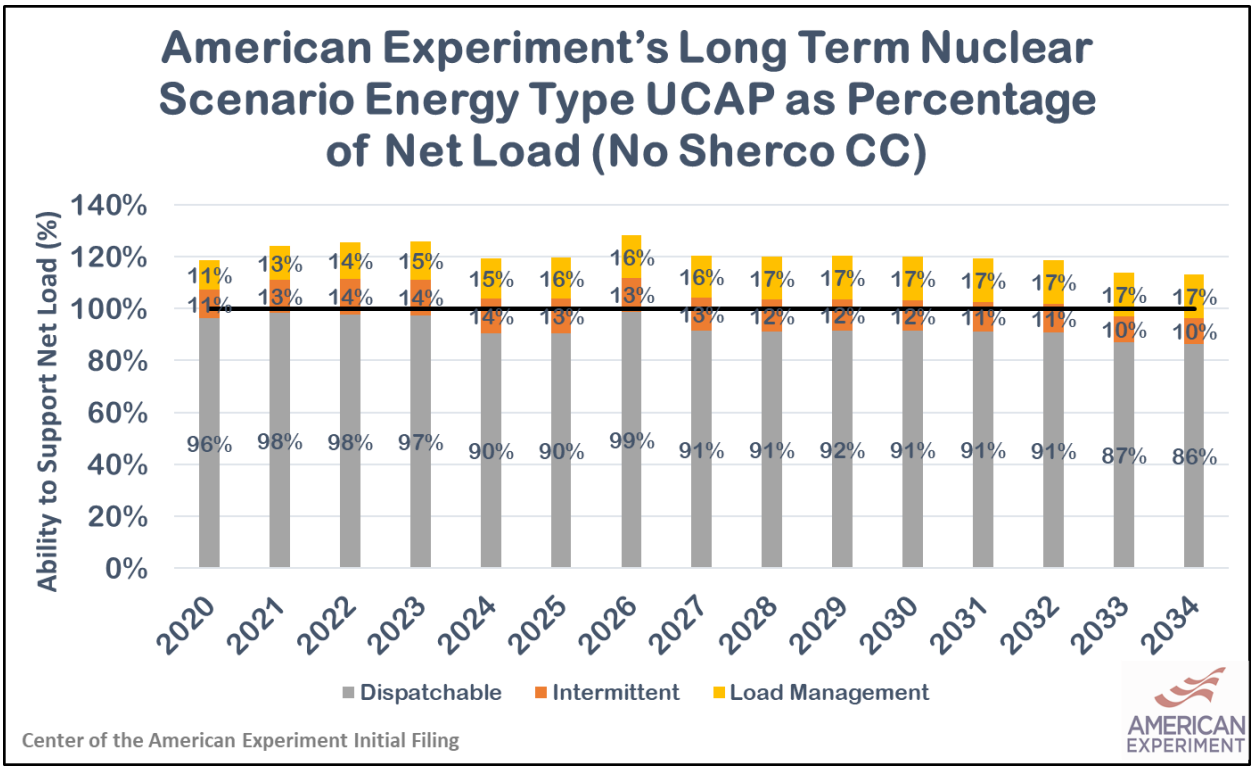

Figure 16. Percentage of net load that can be supported by dispatchable, intermittent, and load management resources in Center of the American Experiment's long term nuclear scenario.

By choosing dispatchable clean energy solutions, such as nuclear, hydro, and low-emitting natural gas technologies, Minnesota's electrical grid would not need to sacrifice reliability and affordability in favor of clean energy. Furthermore, Xcel's grid would be able to meet demand using a mixture of dispatchable resources and load management mechanisms, meaning it

wouldn't exhibit an overreliance on intermittent technologies that would leave Minnesotans at risk for blackouts in the future (See Figure 17).

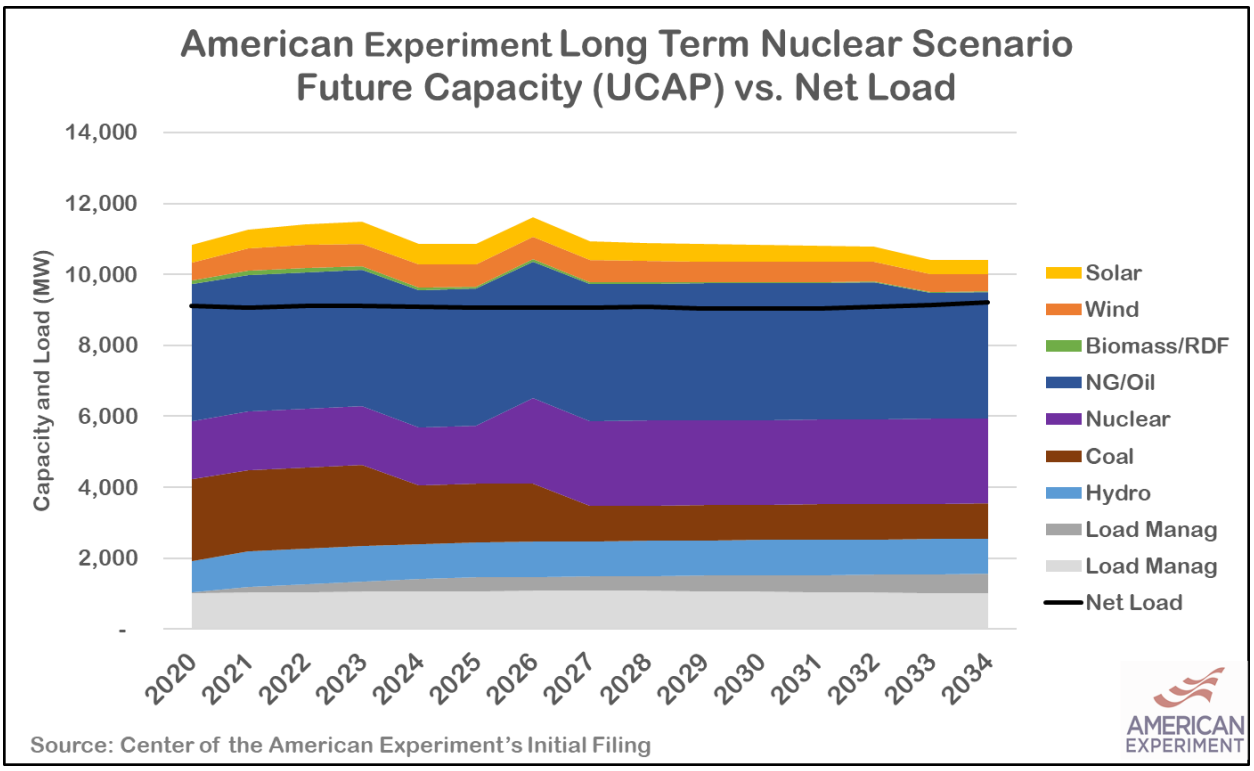

Figure 17. Reliable Capacity (UCAP) on Xcel's system based on American Experiment's Long Term Nuclear scenario from 2020 to 2034.

We ask members of the PUC to consider the serious reliability concerns Xcel's Preferred Plan would impose onto Minnesota's electrical grid. Xcel's Preferred Plan should not be approved in favor of more reasonable and cost-effective scenarios, such as a modified Scenario 15.

Becker Natural Gas Plant

Recently, it has been rumored that Xcel has been second-guessing its inclusion of a natural gas plant in Becker, MN to replace the Sherco coal units up for retirement in the coming years. Instead, the utility company is considering locating multiple smaller natural gas plants in other parts of Minnesota or neighboring states. This would be a major mistake. With retiring coal facilities on the horizon, Xcel must maintain reliability with a firm, dispatchable resource of some kind. As the company states about the MISO RIIA study, which concluded that "the

addition of more non-dispatchable resources and the reduction of large dispatchable resources will result in the deterioration of system strength and system stability."[26]

As stated by Xcel, "the replacement of dispatchable resources at their current locations and/or substantial transmission system development will be fundamentally essential to the reliable delivery of energy to serve consumer demand."[27]

American Experiment believes there are two good options to preserve the strength of the system and utilize existing infrastructure. Option one would consist of utilizing the coal plants at the Sherco and A.S. King sites until the end of their useful lifetimes, and building new, small-modular nuclear reactors on the same sites.

This would allow ratepayers to enjoy lower prices in the short term and reduce emissions by more than would be achieved by building a new natural gas plant. TerraPower, has announced its desire to build a small-modular reactor at the site of a retiring coal plant in Wyoming, which will begin producing electricity in 2028.

The proposed project features a 345 MW sodium-cooled fast reactor with a molten salt-based energy storage system. The storage technology can boost the system's output to 500 MW of power for more than five and a half hours when needed, which is equivalent to the energy required to power around 400,000 homes, according to a company press release.[28]

Building new nuclear power plants on the site of retiring coal plants would be the best way to deliver a "just transition" for communities that currently host large electricity generation facilities. This is a key reason why the PUC should revisit the fate of Sherco 3 and AS King in a later IRP filing.

However, if the coal plants will be prematurely retired, the PUC should approve the new combined cycle natural gas plant in Becker. Locating new power plants at any location other than those with retiring coal facilities would result in wasted transmission infrastructure and necessitate the building of new transmission lines elsewhere. This would cost Minnesota

[26] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

[27] Xcel Energy, "2020-2034 Upper Midwest Integrated Resource Plan," June 30, 2020, https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F0AB0573-0000-C11C-B7B2-2FA960B89BD1}&documentTitle=20206-164371-01

[28] TerraPower, "TerraPower, Wyoming Governor and PacifiCorp Announce Efforts to Advance Nuclear Technology in Wyoming," June 2, 2021, https://www.terrapower.com/natrium-demo-wyoming-coal-plant/

ratepayers millions of dollars, in addition to the billions they would be forced to pay for new renewable facilities.

Conclusion

American Experiment advocates for a modified Scenario 15 in which both of Xcel's nuclear plants are relicensed and coal plants operate at least until the end of their useful lifetimes, but no new wind or solar facilities are constructed.

We believe Scenario 15 is the most prudent course of action because it allows ample time to observe changes in emerging technologies that will ultimately determine the reliability and affordability of the bulk power system.

Respectfully submitted,

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