COMMERCE DEPARTMENT MINNESOTA POLLUTION CONTROL AGENCY

January 5, 2023

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

RE: **In the Matter of Establishing an Updated 2023 and 2024 Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation under Minn. Stat. § 216H.06.**
Docket Nos. E999/CI-07-1199 and E999/DI-22-236

Dear Mr. Seuffert:

Attached are the Analysis and Recommendations of the Minnesota Pollution Control Agency and the Minnesota Department of Commerce, Division of Energy Resources (collectively, the Agencies) regarding the 2023 (and 2024) update to the range of cost estimates for the future cost of carbon dioxide (CO_2) regulation on electricity generation, as required by Minn. Stat. § 216H.06.

The current range of values, established in the Minnesota Public Utilities Commission (Commission) order on September 30, 2020, is a range of $5 to $25 per ton of CO_2 emitted, to be used in electric resource acquisition proceedings for planning year 2025 and beyond. As detailed in the attached Analysis and Recommendations, the Agencies recommend that the Commission raise the upper bound of the existing range of likely costs of CO_2 regulation to $30 per ton of CO_2 emitted, but keep the lower bound at $5 per ton of CO_2 emitted. Additionally, the Agencies recommend to keep 2025 as the threshold planning year for which these values should begin to be applied. The Agencies also recommend that the Commission continue to direct utilities use the same scenarios of combining regulatory and environmental cost values as established in the September 2020 order, but recommend that the Commission consider requiring an additional scenario that reflects meeting the state goal of 100% carbon free electricity by 2040.

The Agencies are available to answer any questions in this matter that the Commission may have.

Sincerely,

ADWAY DE, PH.D.
Public Utilities Rates Analyst
Commerce Department

DAVID BAEL
Economic Policy Analyst
Pollution Control Agency

I. BACKGROUND

Minnesota Statute Section 216H.06 states:

> **216H.06 EMISSIONS CONSIDERATION IN RESOURCE PLANNING.**
>
> By January 1, 2008, the Public Utilities Commission shall establish an estimate of the likely range of costs of future carbon dioxide regulation on electricity generation. The estimate, which may be made in a commission order, must be used in all electricity generation resource acquisition proceedings. The estimates, and annual updates, must be made following informal proceedings conducted by the commissioners of commerce and pollution control that allow interested parties to submit comments.

In its September 30, 2020 *Order Establishing 2020 and 2021 Estimate of Future Carbon Dioxide Regulation Costs*, the Commission established a range of regulatory costs of $5 to $25 per short ton of carbon dioxide (CO_2) emitted, effective 2025 and thereafter. Utilities were to apply these costs in all electricity generation resource acquisition proceedings during 2020 and 2021. Furthermore, the Commission addressed the manner in which both the environmental cost values established in Docket No. E-999/CI-14-643 and the regulatory cost values were to be applied. The Commission ordered that the following planning scenarios be undertaken to apply the two cost ranges:

1. Incorporate the low end of the environmental cost range for all years.
2. Incorporate the high end of the environmental cost range for all years.
3. Incorporate the low end of the environmental cost range through 2024, but then substitute in the low end of the regulatory cost range starting in 2025 and thereafter.
4. Incorporate the high end of the environmental cost range through 2024, but then substitute in the high end of the regulatory cost range starting in 2025 and thereafter.

Additionally, in its September 30,2020 order, the Commission directed that for reference case scenarios of all electricity generation resource acquisition proceedings, utilities should apply middle to high ends of both the environmental cost range (for all years) and the regulatory cost rage (for 2025 and thereafter).

On June 30, 2022, the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Commerce, Division of Energy Resources (Commerce) (collectively, the Agencies) requested comments from interested stakeholders on whether the regulatory cost range established by the Commission ($5 to $25 per short ton) remains reasonable, and if not, what the range should be; whether 2025 is still the appropriate threshold year for the application of regulatory cost values; whether the application scenarios from the Commission's

2020 Order (listed above) remain reasonable and appropriate; and whether the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024. Comments were received from the following stakeholders:

- Center for Energy and the Environment (CEE)
- City of Minneapolis
- Clean Energy Organizations (CEOs)
- Community Power
- Great River Energy (GRE)
- Minnesota Power (MP)
- Otter Tail Power (OTP)
- Xcel Energy (Xcel)

For ease of reference, a copy of the comments received is included in Attachment 1.

II. AGENCIES' ANALYSIS

A. REGULATORY COST RANGE

Some commenters (MP, OTP) stated that the current $5-$25 per ton regulatory cost range remains reasonable while other commenters (City of Minneapolis, CEOs, Community Power) recommended significant increases to the regulatory cost range. Generally, those that argued for not changing the current values pointed out that there have been no significant changes in the landscape of pricing greenhouse gases (GHGs) through regulations at the federal or state level that would warrant a change from the status quo. Those that argued for increasing regulatory cost values pointed to the Paris climate agreement and that there are new federal and state policy goals to decarbonize our economy over the next couple of decades. They also suggested that increased extreme weather and deleterious climate events indicate a greater likelihood of higher regulatory costs in the near future and that low regulatory costs presents an economic risk to Minnesota electricity customers whose rates could be impacted by carbon pricing regulations. These commenters proposed regulatory cost values per ton of CO_2 of $40-$80 (City of Minneapolis), $5-$75 (CEOs), and a minimum of $50 (Community Power). As is detailed below, these same commenters tended to argue for sooner application of regulatory costs than 2025. Some commenters seemed to conflate regulatory costs and environmental costs and hoped that regulatory costs would reflect the full societal damages of emissions. As the Commission is already aware, regulatory and environmental costs are different and separate metrics, and thus choosing appropriate regulatory costs should not be based on consideration of the societal damages from emissions, but rather on the anticipation of regulations that would impose compliance costs on Minnesota electricity generators.

Xcel took a more middle-ground position on what regulatory cost values should be, recommending an increase in the upper bound of the range from $25 to $30 per ton of CO_2. Xcel argued that keeping the lower bound of the range low (at $5 per ton of CO_2) is appropriate given the continued lack of federal or state regulations that put a price on carbon emissions from the electric sector. However, Xcel pointed out other factors that support a slight increase in the upper bound of the range. These include rising clearing prices in existing U.S. carbon trading markets, including the Western Climate Initiative (WCI) and the Regional Greenhouse Gas Initiative (RGGI). These existing carbon market prices may be the best available proxies on which to base predictions of regulatory costs, and indeed, these carbon market prices have factored strongly in the Agencies' past recommendations for regulatory cost values, and they continue to do so. In particular, Xcel pointed out that the WCI clearing prices have recently eclipsed $25 per ton of CO_2, albeit only slightly, which suggests an upper bound for regulatory cost values in Minnesota should be increased to keep pace with the WCI values. Xcel also pointed out some increased uncertainty in the GHGs regulatory landscape, particularly in the wake of the recent U.S. Supreme Court decision in the West Virginia vs EPA case and the expected coming updates from the EPA to rules 111(b) and 111(d), portions of the Clean Air Act which regulate emissions from new and existing power plants. Increased uncertainty around regulations can justify widening the range of regulatory cost values.

Neither CEE nor GRE took a position on what the regulatory cost range should be. CEE only commented on how the regulatory and environmental costs should be applied in tandem (see below). GRE pointed out that it is not contemplating the addition of any fossil fuel resources and thus would not be significantly impacted by a regulatory cost of carbon.

The Agencies acknowledge that while all of the commenters made some good points, that at this point there is still not sufficient objective basis for significantly changing the current cost range of $5-$25 per ton of CO_2, but a moderate change is warranted. The Agencies agree with comments from Xcel that enough remains uncertain about the shape and timing of federal and state carbon regulation that makes it reasonable to retain the current lower bound of the cost range. Presently, there is no concrete federal or state legislative or regulatory framework on which to base carbon emissions regulatory costs. The Agencies also agree with Xcel that the rising clearing prices in existing U.S. carbon market to the point that some have eclipsed $25 per ton, suggests a small increase in the upper bound of the range is reasonable. The Agencies maintain that the allowance prices in WCI and RGGI remain the best estimates or proxies for future regulatory costs of carbon emissions. Starting in late 2021 and continuing into 2022, the market clearing allowance prices in the WCI have eclipsed $25 per ton of CO_2. Moreover, while there has been significant volatility in both WCI and RGGI, the overall trend in both of these markets has been increasing, and these increases have been particularly steep over the past year.

Currently, utilities start with a range of $5 to $25 per ton of CO_2 in 2025 and escalate these values every year by some factor. For example, Xcel uses an escalation rate of 2% per annum for these costs[1]. The Commission has not specified an escalation factor for these costs in its past orders and utilities have been using different values in their planning process. The market clearing allowance prices in both WCI and RGGI have had an upward trend despite their volatility. As these markets are designed to reduce the supply of allowances to help meet more aggressive decarbonization targets in the future, the equilibrium prices are expected to have an upward trend. While the compound annual growth rate in historic equilibrium market prices is sensitive to start and end years, they remain consistently higher than the Federal Reserves' long term inflation target of 2%. The Agencies propose that the Commission adopt a uniform escalation rate of 4% per annum for the regulatory cost of carbon that should be used by all electric investor-owned utilities (IOUs) in their planning process. This escalation factor can be updated in subsequent rounds as more data becomes available.

In summary, the Agencies note that there have not been significant regulatory developments since the Commission last set these values in September 2020 to provide an objective basis for significantly altering the current cost range of $5 to $25 per ton of CO_2 emissions. However, the Agencies do believe that the combination of future regulatory uncertainty and rising allowance prices in U.S. carbon markets warrants a slight expansion of the regulatory cost range and recommend an increase of the upper bound of the range from $25 to $30 per ton of CO_2 emissions. The Agencies also recommend the adoption of a yearly escalation factor of 4% for the regulatory cost that should be used by all electric IOUs for their planning purposes.

B. DATE OF APPLICATION

The views of the commenters on when the regulatory cost values should be applied fell along similar lines to their views on what these values should be. Several of the utilities (MP, Xcel) found 2025 to continue to be a reasonable starting year of application. The CEOs also argued that 2025 continues to be an appropriate threshold year. OTP stated that based on anticipated regulations, or lack thereof, 2028 is a more reasonable year to start applying regulatory cost values but also stated that keeping the starting year at 2025 is not particularly unreasonable. Other commenters who argued for an increase in the cost range (City of Minneapolis, Community Power) argued that delaying the application of regulatory costs to 2025 is unnecessary and should be applied as soon as possible. GRE again took no position on when regulatory cost values should be applied.

The Agencies agree with the majority of commenters that there is not sufficient objective basis for revising the current 2025 threshold year affirmed by the Commission in 2020. While GHG regulations at the federal or state level that would impose compliance costs on Minnesota

[1] Look at Table IV-2: CO_2 Costs on Page 141 of Xcel's filing on June 30, 2020 in Docket E002/RP-19-368

electricity generators as soon as 2025 are unlikely, they cannot be entirely ruled out. All commenters seem to agree that there is significant uncertainty in the future of regulatory carbon emission costs, just as there was when the Commission ruled on this in September 2020. The Agencies believe that this uncertainty weighs in favor of keeping current decisions in place rather than overturning them.

Thus, the Agencies recommend that the current threshold year to apply regulatory cost values of 2025 should remain in effect. For the commenters who suggested that federal or state regulations that require compliance costs could be enacted sooner than 2025, the Agencies point out that the Commission could reopen this docket sooner than its next scheduled review of regulatory cost values.

C. APPLICATION OF REGULATORY AND ENVIRONMENTAL COST RANGES

Most commenters either stated that the current Commission decision about how to apply regulatory and environmental cost ranges (described above) is reasonable or did not weigh in on the issue. Only CEE, City of Minneapolis, and CEOs argued for changes in the Commission's current required planning scenarios. CEE commented fairly extensively on this issue, arguing that the Commission should not require planning scenarios with only regulatory costs and no environmental costs because the regulatory costs do not fully account for the societal damages from carbon emissions and thus do not fully internalize the externality. While CEE agrees that both regulatory and environmental costs should not be applied additively, that scenarios that include regulatory cost values but no environmental cost values, that the difference between the environmental and regulatory cost should also be included in order to fully internalize the externality. CEOs made a very similar argument, also maintaining that when regulatory costs are lower than environmental costs then in scenarios that only include regulatory costs the balance of externality values should also be applied.

The Agencies acknowledge the general economic principle that in order to reach the socially optimal outcome, the full magnitude of the externality should be internalized by the utility in the decision-making process. However, because regulatory costs and environmental costs are applied in different stages of the resource planning process, it is not meaningful to compare these two costs dollar for dollar. Future regulatory costs are considered as future internal costs and treated just like any other variable cost, and are therefore considered by the model when it selects units to dispatch. Externality values, however, are considered separately and applied to the suite of resources a model run selects so that externality costs are considered when ranking the cost of each plan. This method is consistent with what the costs represent – future internal costs, and externality costs. Essentially, the carbon reductions achieved through a $1 regulatory cost is very different from a $1 externality cost. Thus, it is not sensible to apply a regulatory cost and then an additional environmental cost in the same planning scenario. The Agencies found that regulatory costs can have a significantly greater impact in terms of carbon emission reduction than environmental costs due to the stage of the resource planning process to which

each are applied. The Agencies maintain that regulatory costs and environmental costs are two distinct and separate measures, and thus we do not recommend applying both the regulatory cost and the residual environmental cost together in the same planning scenario.

Some commenters recommended policy proposals outside of the scope of this docket. While these proposals may be worthy of exploration by the Commission, the agencies do not believe they should be considered here and do not offer analysis of them. For example, CEE also argued for adding an additional planning scenario with a higher environmental cost than what the PUC previously decided to reflect more recent work by the federal Interagency Working Group (IWG) on the social costs of GHGs. This added scenario should have a discount rate lower than 3% and should reflect the advances in climate damage modeling since the IWG established the values that serve as the basis for the Commission's establishment of environmental cost values (Docket No. E-999/CI-14-643). Since this docket is about scenarios with respect to levels of regulatory cost of carbon, this proposal about appropriate environmental externality cost values is outside the scope of the current docket.

The City of Minneapolis and CEOs argued that the PUC should require additional scenarios that reflect recent federal and state policy goals to decarbonize the energy sector by 2035 or 2040. Specifically, CEOs proposed that the Commission should require utilities to include in their resource plans a scenario that would allow them to achieve 80% carbon-free electricity generation by 2030. Furthermore, this added scenario should also discuss the utilities' technological options for elimination of all or nearly all of the remaining 20% of carbon-emitting resources by 2035, though it would not need to specify their cost. While these points have merit, the Agencies maintain that federal and state policy goals do not reflect actual regulatory costs, at least not at this time, and are also outside the scope of the current docket. The Agencies would like to point out that stakeholders already have the ability to run different scenarios in the Integrated Resource Planning (IRP) dockets for each of the electric IOUs. Stakeholders can explore the effects of different parameters as outlined in the above two proposals in any IRP docket.

The Agencies recommend no changes to the Commission's current decision for how to apply these value ranges in resource planning and acquisition proceedings. The Agencies think it is valuable to require utilities to provide the same basic scenarios in such proceedings, and note that the utilities and other stakeholders are not precluded from providing or requesting additional scenarios or sensitivity analyses. Importantly, the Commission's scenarios requirements are consistent with Minnesota Statutes §§ 216H.06 and 216B.2422, subd. 3, to consider future regulatory cost of carbon regulation and environmental externality values in resource planning and acquisition proceedings.

D. APPLICABILITY TO PROCEEDINGS IN ONLY 2023 OR IN 2023-2024

All commenters who weighed in on this topic thought it was reasonable for the decision of the Commission at this point to apply to resource proceedings in both 2023 and 2024. The Agencies agree with these commenters. It is unlikely that there will be substantial new information over the next year that will affect 2024 proceedings, and if that changes the Commission can always elect to re-open this question in 2023 and solicit input and recommendations from the Agencies at that time. Meanwhile, the Agencies will continue to monitor developments in carbon regulations and if we conclude that there is significant cause to reconsider the decision for 2023, we will raise this with the Commission.

III. CONCLUSIONS AND RECOMMENDATIONS

The Agencies recommend that the Commission continue the decisions made in its September 30, 2020 Order, with the exceptions of increasing the upper end of the regulatory cost range from $25 to $30, set the annual increase in regulatory cost values to 4%, and update the years for which this decision applies to 2023 and 2024. Specifically, the Agencies recommend that the Commission:

1. Quantify and establish the range of regulatory costs of carbon dioxide emissions as $5 to $30 per short ton effective 2025 and after. Note that this modifies the Commission's previous decision to use a range of $5 to $25.

2. Require that, in all electricity generation resource acquisition proceedings during 2023 and 2024, utilities shall analyze potential resources under a range of assumptions about environmental values, including scenarios that:

   A. Incorporate, for all years, the low end of the range of environmental costs for carbon dioxide as approved by the Commission in its January 3, 2018 Order Updating Environmental Costs in Docket No. E999/CI-14-643.

   B. Incorporate, for all years, the high end of the range of environmental costs for CO_2 as approved by the Commission in its January 3, 2018 Order.

   C. Incorporate the low end of the range of environmental costs for CO_2 but substituting, for planning years after 2024, the low end of the range of regulatory costs for CO_2 emissions, in lieu of environmental costs.

   D. Incorporate the high end of the range of environmental costs for CO2 but substituting, for planning years after 2024, the high end of the range of regulatory costs for CO2 emissions, in lieu of environmental costs.

3. Set annual escalation factor for the regulatory cost of carbon at 4%.

4. Apply to proceedings in 2023 and 2024.

Attachment 1: Comments from Stakeholders in Response to the Agencies' June 30, 2022 Request for Comment

Center for Energy and Environment

August 31, 2022

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

RE: Center for Energy and Environment's Comments in the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. §216H.06

Docket Numbers E999/DI-22-236 and E999/CI-07-1199

Dear Mr. Seuffert,

Center for Energy and Environment ("CEE") respectfully submits these Comments to the Minnesota Public Utilities Commission ("Commission") in response to the June 30, 2022 Request for Comments issued by the Minnesota Department of Commerce, Division of Energy Resources ("Department") and the Minnesota Pollution Control Agency ("MPCA") in the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minnesota Statute §216H.06 in this docket.

Minnesota Statute §216H.06 requires the Commission to establish a likely range of costs of future carbon dioxide (or "CO2") regulation on electricity generation, following informal proceedings led by the Department and MPCA that allow interested parties to submit comments. The Department and MPCA's June 30, 2022 Request for Comments noted that the Commission is not required to provide an additional opportunity for interested parties to provide written comments and encouraged all interested parties to respond to the June 30, 2022 Request for Comments.

Therefore, CEE submits these Comments to the Commission. We hope that the Department and MPCA will also consider our comments in the development of analysis and recommendations to the Commission on this matter.

Background

The June 30, 2022 Request for Comments in this docket requested that stakeholders provide input on:

- whether the currently established range of regulatory costs of CO2 emissions of $5 to $25 per short ton remains reasonable, and if not, what range should be established and why;

- whether 2025 is the appropriate threshold year for the application of the value range;
- whether the application scenarios listed in the Commission's September 30, 2020 Order remain reasonable and appropriate; and
- whether the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024.

For these Comments, CEE will focus on whether the application scenarios listed in the Commission's September 30, 2020 Order[1] remain appropriate. For reference, Ordering Point Two of the Commission's September 30, 2020 Order stated:

> 2. In all electricity generation resource acquisition proceedings during 2020 and 2021, utilities shall analyze potential resources under a range of assumptions about environmental values, including—
>
> A. Scenarios that incorporate, for all years, the low end of the range of environmental costs for carbon dioxide as approved by the Commission in its January 3, 2018 Order Updating Environmental Costs in Docket No. E-999/CI-14-643, In the Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statutes Section 216B.2422, Subdivision 3, and set forth in Attachment A.
>
> B. Scenarios that incorporate, for all years, the high end of the range of environmental costs for CO2 as approved by the Commission in its January 3, 2018 order, and set forth in Attachment A.
>
> C. Scenarios that incorporate the low end of the range of environmental costs for CO2 but substituting, for planning years after 2024, the low end of the range of regulatory costs for CO2 regulations ($5 per short ton) in lieu of environmental costs.
>
> D. Scenarios that incorporate the high end of the range of environmental costs for CO2 but substituting, for planning years after 2024, the high end of the range of regulatory costs for CO2 regulations ($25 per short ton) in lieu of environmental costs.

[1] Docket Numbers E-999/CI-07-1199 and E-999/DI-19-406.

> E. A reference case scenario incorporating the Commission's middle or high values of the established environmental and regulatory cost ranges.[2]

Comments

CEE recommends that the Commission reconsider the application of the regulatory cost of CO2 in modeling scenarios that electric utilities must analyze in resources acquisition proceedings. Specifically, we recommend that the Commission no longer require modeling scenarios in which utilities fully substitute the regulatory cost of CO2 for the environmental costs of CO2. While we understand that this has been the modeling approach used since Minnesota established a regulatory cost of CO2, and we believe that approach may have been appropriate in the past, we believe that this approach should be reviewed and revised.

Additionally, we recommend that the Commission require utilities to model a scenario in resource acquisition proceedings using a higher environmental cost of CO2, based on recent work by the Interagency Working Group on Social Cost of Greenhouse Gases, United States Government.

<u>The Regulatory Cost and the Environmental Cost of Carbon Dioxide</u>

In the first Order establishing a regulatory cost of carbon dioxide under Statute 216H.06, the Commission stated:

> CEED, the Department, the Environmental Intervenors and the Municipal Group asked the Commission to clarify that whatever estimates of CO2 regulation costs the Commission may adopt in this docket would not apply in *addition* to the existing estimates of CO2 externality costs.
>
> The Commission finds merit in this clarification. While the calculation of externality values under 216B.2422 is not directly comparable to the estimate of regulatory costs under 216H.06, they both reflect steps to account for the burdens that CO2 emissions impose on third parties. When a utility calculates the cost of emitting another ton of CO2 in any given year, therefore, it would be inappropriate to use both the CO2 externality value and

[2] Page Nine of the Commission's September 30, 2020 Order in Docket Numbers E-999/CI-07-1199 and E-999/DI-19-406.

> the CO2 regulatory cost estimate. But utilities should continue to apply the Commission's CO2 externality values otherwise.[3]

CEE agrees that that the estimated regulatory cost of CO2 should not be additive to the estimated environmental costs of CO2. However, we do not believe that it is always appropriate to omit the environmental costs of CO2 entirely when including the regulatory cost of carbon in a modeling scenario. While the estimated regulatory cost of CO2 and the estimated environmental cost of CO2 are different, they are related and not simply two different ways to quantify the burden of CO2 emissions.

The environmental cost of CO2 represents the estimated economic damages caused by emitting an additional ton of CO2 into the atmosphere at a particular point in time. These costs are externalities because they are not internalized into the cost of energy through taxes, fees, utility rates, fuel costs, or otherwise. Therefore, ratepayers do not pay these costs through utility bills. Rather, these costs are borne by society broadly. The Commission establishes a range of estimated environmental costs for CO2 emissions to be used for decision-making in resource-selection proceedings. The currently approved values were established in the Commission's January 3, 2018 Order in Docket Number E999/CI-14-643.

The estimated regulatory cost of CO2 represents the likely costs that regulation will impose on utilities for future CO2 emissions. Imposing a regulatory cost to CO2 emissions effectively internalizes some or all of the external environmental costs of CO2. A regulatory cost of CO2 emissions would be paid by the utility and, therefore, passed on to ratepayers through utility bills.[4]

The way that these two values interact depends on how much of the environmental costs of CO2 are expected to be internalized through future regulation. For instance, in 2007, at the time of the Commission's first Order establishing a regulatory cost of CO2, the Commission estimated that CO2 regulation of electricity generation would cost between $4 and $30 per ton of emissions.[5] At that time, the Commission estimated the environmental damage of CO2 emissions to be between $0.38 and $3.91 per ton of emissions. In short, the regulatory cost of CO2 emissions was estimated to be higher than the estimated environmental costs of CO2 emissions. This indicates that the Commission, in 2007, expected that future regulation of CO2 would internalize more than 100 percent of the environmental costs of CO2 emissions. As such, there was no need to consider the estimated environmental costs of CO2 in an analysis that included the estimated regulatory cost of CO2.

[3] Page 4 of the Commission's December 21, 2007 Order in Docket Number E999/CI-07-1199.
[4] Pag 3 of the Commission's December 21, 2007 Order in Docket Number E999/CI-07-1199.
[5] Page 11, Ordering Point 1, of the Commission's December 21, 2007 Order in Docket Number E999/CI-07-1199.

Over time, the relative values of the estimated regulatory cost of CO2 and the estimated environmental cost of CO2 have reversed, compared to 2007. The Commission's September 30, 2020 Order established regulatory costs of CO2 ranging from $5 to $25 per ton of emissions, effective in 2025 and thereafter.[6] The currently approved environmental cost of CO2 for 2025 ranges from $10.07 to $46.96 per ton of emissions. This indicates that, at the time of the 2020 Commission Order, the Commission anticipated that future regulation would not internalize the full environmental damage of CO2 emissions, but rather a portion. Based on the high-end approved values for 2025, the Commission anticipated that the future regulatory costs applied to CO2 emissions would internalize a little over half of the total environmental damage of emissions.

CEE does not take a position on whether the previously approved regulatory cost of CO2 values remain reasonable. Predicting the actions of a future U.S. Congress related to CO2 emissions regulation is extremely challenging and uncertain and we look to other stakeholders to provide insight and expertise on the appropriate values and timeline for the regulatory cost of CO2. However, we believe that if the Commission adopts a regulatory cost of CO2 that is less than the corresponding environmental cost of CO2, then the incremental environmental costs (i.e. the environmental cost of CO2 value minus the regulatory cost of CO2 value) should be included in the modeling scenario. To do otherwise, is to effectively discount the true environmental and economic burden of CO2 emissions.

Modeling Scenarios

Modeling a scenario that includes the regulatory cost of CO2 is valuable and provides useful information about both resource selection and operation of those resources.[7] Similarly, modeling a scenario that only includes the external environmental cost of CO2 is valuable and most closely reflects the current situation.

When conducting resource analyses that include the regulatory cost of CO2, utilities incorporate the regulatory cost of CO2 into the dispatch model analysis for all CO2-emitting resources. The regulatory cost of CO2, therefore, provides the model a price signal for CO2 emissions, which informs how generation units are then dispatched by the model and, importantly, what resources are most cost-effective over the analysis period considering that price signal. CEE believes that such an analysis is increasingly important. It allows regulators, utilities, and stakeholders to see how the utility system would be optimized – both in terms of resource selection and operation – if environmental costs of CO2 emissions were embedded into our energy costs. CEE believes that

[6] Ordering Point 1 of the Commission's September 30, 2020 Order in Docket Numbers E-999/CI-07-1199 and E-999/DI-19-406.

[7] We note that, as described above, in this instance, we support using a combination of the regulatory cost of CO2 and the environmental cost of CO2 if and when the regulatory cost of CO2 is less than the environmental cost of CO2.

this perspective is not only useful in integrated resource planning and other resource acquisition proceedings, but may also be informative for rate design and other types of proceedings.

In contrast, in resource acquisition analyses the environmental cost of CO2 is not incorporated into dispatch modeling. Instead, it is our understanding that the environmental cost of CO2 emissions is incorporated through the capacity expansion model, after the dispatch model analysis is complete. When a scenario only incudes the environmental cost of CO2, the dispatch model optimizes utility operations to be least-cost, based on fuel and operations and maintenance ("O&M") costs alone (i.e. dispatch decisions do not account for CO2 emissions). This modeling scenario is also valuable. It reflects the total resource costs, plus the resulting environmental costs of emissions, and selects resources based on those costs. It does not, however, optimize for dispatch decisions that reduce emissions. To model the environmental costs of CO2 without a regulatory cost of CO2 is reflective of how utilities operate under current conditions and how they would continue to operate if CO2 regulation fails to materialize.

Therefore, CEE recommends that the Commission continue to consider both types of costs of CO2 when considering resource acquisitions going forward. We recommend the Commission require utilities to analyze the following scenarios in resource acquisition proceedings.

A. A scenario that includes the Commission's approved low-end environmental cost of CO2 values without an assumed regulatory cost of CO2.
B. A scenario that includes the Commission's approved high-end environmental cost of CO2 values without an assumed regulatory cost of CO2.
C. A scenario that incorporates the Commission's approved low-end environmental cost of CO2 values, but, starting at a date specified by the Commission, switches to the Commission's approved low-end regulatory cost of CO2, as well as any incremental amount of the Commission's approved low-end environmental cost of CO2 values (i.e. the amount by which the environmental cost of CO2 is over and above the approved regulatory cost of CO2), where applicable.
D. A scenario that incorporates the Commission's approved high-end environmental cost of CO2 values, but, starting at a date specified by the Commission, switches to the Commission's approved high-end regulatory cost of CO2, as well as any incremental amount of the Commission's approved high-end environmental cost of CO2 values (i.e. the amount by which the environmental cost of CO2 is over and above the approved regulatory cost of CO2), where applicable.

We note that these four recommended scenarios mirror the scenarios included in Ordering Point 2, A., B., C., and D. from the Commission's September 30, 2020 Order, except for the inclusion of the incremental environmental cost of CO2 values in our recommendations C. and D. above. Other modeling scenarios may be also be useful to the Commission.

Recommendation for an Additional Modeling Scenario

Since the Commission last established estimated values for the environmental cost of CO2, climate science has advanced, the effects of climate change have intensified, and approaches to discounting long-term phenomena have evolved. CEE does not propose reopening a docket to update the environmental cost of CO2 at this time. However, we recommend that the Commission add a required modeling scenario for utility generation resource acquisition proceedings that includes the higher environmental damage values associated with a 2.5 percent discount rate included in the February 2021 *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide, Interim Estimates under Executive Order 13990* (or "2021 Technical Support Document").[8]

The Commission last established a range of values for the environmental cost of greenhouse gas emissions for 2017 through 2050 in its January 3, 2018 Order in Docket No. E-999/CI-14-643. The regulatory process leading up to that 2018 Order started in 2013 and included robust stakeholder discussions, a contested case led by an Administrative Law Judge, and nearly two additional years of regulatory record development. The values the Commission established in 2018 are based the July 2015 Interagency Working Group ("IWG") Technical Support Document. [9]

Recently, the federal government undertook efforts to update those figures with more recent data and analysis and published the 2021 Technical Support Document with updated, interim social costs of carbon in February 2021. While that guidance has not yet been adopted, interim social cost of CO2 figures included in the 2021 Technical Support Document rely on new and additional data and analysis since the Commission's 2018 Order. The IWG findings in the February 2021 Technical Support Document include the following.

- The IWG found that discount rates below 3 percent may be most appropriate for estimating intergenerational damages. In the 2021 Document, IWG states that social cost of CO2 values based on lower discount rates are consistent with the latest scientific and economic understanding of discounting approaches relevant for intergenerational analysis.[10]

- The IWG found reason to apply declining discount rates in the calculation of damages, stating that models used in setting previous social cost of greenhouse gas values "do not

[8] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf
[9] Table 5 on page 31 of the Commission's January 3, 2018 Order in Docket No. E-999/CI-14-643.
[10] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf (p. 23)

reflect the tremendous increase in the scientific and economic understanding of climate-related damages that has occurred in the past decade."[11]

- The IWG found that "because of the distinctive global nature of climate change that analysis of Federal regulatory and other actions should center on a global measure of [social cost of greenhouse gas emissions]."[12]

- Finally, the 2022 guidance applies recent data to update "a common set of assumptions in each model for future population, economic, and GHG emissions growth, as well as equilibrium climate sensitivity – a measure of the globally averaged temperature response to increased atmospheric CO2 concentrations."[13]

CEE recommends that the Commission require utilities to use the updated interim social cost of CO2 figures included in the 2021 Technical Support Document as a sensitivity scenario in utility resource acquisition proceedings. Because the 2021 Technical Support Document includes interim, and not adopted, values, we do not recommend that the Commission initiate a lengthy and intensive process to update Minnesota's established externality values at this time. However, including the updated, interim values as a sensitivity in regulatory proceedings would reflect the trajectory of upcoming changes to the U.S. social cost of CO2 and provide the Commission, utilities, and stakeholders an understanding of how resource decisions may change going forward. Additionally, the interim social cost of CO2 values included in the 2021 Technical Support Document likely more realistically represent the economic and environmental burden of CO2 emissions.

Conclusion

CEE recommends the Commission order the following.

1. If the Commission's approved regulatory cost of CO2 is less than the corresponding environmental cost of CO2, then the incremental environmental costs (i.e. the environmental cost of CO2 value minus the regulatory cost of CO2 value) shall be included in the modeling scenario for all applicable years.
2. In all electricity generation resource acquisition proceedings during 2023 and 2024, utilities shall analyze potential resources under a range of assumptions about environmental values, including—

[11] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf (page 22)
[12] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf (page 16)
[13] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf (page 23)

A. A scenario that includes the Commission's approved low-end environmental cost of CO2 values without an assumed regulatory cost of CO2.
B. A scenario that includes the Commission's approved high-end environmental cost of CO2 values without an assumed regulatory cost of CO2.
C. A scenario that incorporates the Commission's approved low-end environmental cost of CO2 values, but, starting at a date specified by the Commission, switches to the Commission's approved low-end regulatory cost of CO2, as well as any incremental amount of the Commission's approved low-end environmental cost of CO2 values (i.e. the amount by which the environmental cost of CO2 is over and above the approved regulatory cost of CO2), where applicable.
D. A scenario that incorporates the Commission's approved high-end environmental cost of CO2 values, but, starting at a date specified by the Commission, switches to the Commission's approved high-end regulatory cost of CO2, as well as any incremental amount of the Commission's approved high-end environmental cost of CO2 values (i.e. the amount by which the environmental cost of CO2 is over and above the approved regulatory cost of CO2), where applicable.
E. A scenario that includes the higher environmental damage values associated with a 2.5 percent discount rate included in the February 2021 *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide, Interim Estimates under Executive Order 13990*.[14]

We thank the Commission, the Department, and the MPCA for consideration of our Comments.

Please contact me at apartridge@mncee.org with any questions.

Sincerely,

Audrey Partridge
Director of Regulatory Policy
Center for Energy and Environment

[14] https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

AFFIDAVIT OF SERVICE

DOCKET NUMBERS E999/DI-22-236 and E999/CI-07-1199

I, Audrey Partridge, herby certify that on this 31st day of August 2022, I served Center for Energy and Environment's *Comments in the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. §216H.06, Minnesota* in Docket Numbers E999/DI-22-236 and E999/CI-07-1199 on the following persons on the attached Service Lists by:

_XX_ placing such filing in envelopes, properly addressed, and depositing the same in the Post Office at the City of Minneapolis, for delivery by the United States Post Office as directed by said envelopes.

_XX_ electronic filing

/s/ Audrey Partridge
Audrey Partridge

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Minneapolis
City of Lakes

Health Department
Division of Sustainability
505 South 4th Avenue, Suite 500
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Tel 612.673.3666

August 31, 2022

Commissioner Arnold
85 7th Place East, Suite 280
Saint Paul, Minnesota 55101

Commissioner Kessler
520 Lafayette Road N
Saint Paul, MN 55155-4194

RE: Docket No. E999/DI-22-236 In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06

Dear Commissioners Arnold and Kessler:

The City of Minneapolis ("Minneapolis"), a municipality as defined in Minn. Stat. § 216B.02, subd. 2b, respectfully submits these Comments in response to the Minnesota Pollution Control Agency ("MPCA") and the Minnesota Department of Commerce, Division of Energy Resources ("Department") (together, "the Agencies") Notice of Comment Period on the range of cost estimates for the future cost of carbon dioxide ("CO_2") regulation on electricity generation.

The City of Minneapolis, with an estimated 425,000 residents and more than 40,000 businesses, is one of the largest cities in the Upper Midwest and geographically represents a significant portion of electricity consumption in the state. Therefore, the outcome of this proceeding will directly impact the city and our residents and businesses, many of whom are concerned about climate change.

We thank the Agencies for the opportunity to provide comment and respond to the questions below.

Is the currently established range of regulatory costs of CO2 emissions of $5 to $25 per short ton reasonable, and if not, what range should be established and why?

> The City of Minneapolis recommends increasing the range of future regulatory costs of CO_2 emissions from $5 - $25 to a range that better reflects the regulatory costs being called for by the international community in response to the Paris Agreement ("Agreement").[1] Analysis by the World Bank recommends a regulatory range of $40 - $80/$tCO2_e$, with $40 being the lower limit of 2020 prices recommended to be compliant with the Agreement.[2]

[1] The Paris Agreement established a global framework to limit global warming to below 2°C and pursue efforts to limit it to 1.5°C. The United States formally recommitted to the Agreement in January 2021, joining 192 other countries in co-signing. https://www.whitehouse.gov/briefing-room/statements-releases/2021/01/20/paris-climate-agreement/
[2] "State and Trends of Carbon Pricing 2021." The World Bank, Washington, DC. May 2021. p. 12-13. https://openknowledge.worldbank.org/handle/10986/35620

The National League of Cities[3] joins others who have expressed that even with recent federal support for clean energy technologies through the Inflation Reduction Act, additional federal policy will be necessary to set the country on the path to meet the international goals under the Paris Agreement. Notably, the Agreement calls on countries to strengthen their commitments over time, and a leading next step for the United States may include implementation of carbon pricing, similar to many other countries.

Is 2025 the appropriate threshold year for the application of the value range?

Given the increasingly recognized climate emergency[4] impacting Minnesotans as well as people worldwide, it is reasonable and prudent to implement the threshold year before 2025, adopting it as soon as possible. Since the statute passed in 2007 electric utilities and other stakeholders have had the benefit of a growing body of climate data and evolving climate policy to support inclusion of carbon regulatory costs in their analysis. Delay until 2025 is unnecessary as electric utilities can use existing tools to include assumptions about potential cost impacts of CO_2 regulation.

Should the application scenarios listed in the Commission's September 30, 2020 Order remain reasonable and appropriate?

We recommend that the scenarios from the Commission Order include additional scenarios to reflect the recent federal and state policy goals of decarbonizing by 2035[5] and 2040[6] respectively to reflect the country's status as a co-signer to the Paris Agreement since the Order was written. The combined impact of these three developments creates a greater likelihood of a higher regulatory cost of carbon within the lifetime of new generation assets than when the prior scenarios were developed. The number of billion-dollar events in the U.S. has escalated in recent years, including Winter Storm Uri and other extreme weather events, drought, and wildfires, some of which have impacted Minnesota and increased interest in climate action, which may include carbon pricing regulation.[7]

According to National Oceanic and Atmospheric Administration, the United States sustained 56 weather and climate disasters between 2019 and 2021 where overall damages/costs reached or exceeded $1 billion (including CPI adjustment to 2022). The total cost of these 56 events exceeds $315 billion and cost many lives.[8]

We also encourage the Agencies to recommend that the Commission transition away from eliminating externality values in years when the regulatory CO_2 values are assumed.[9] Instead, simply reducing assumptions about the externality values by the

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[3] The National League of Cities observed that while IRA represents the largest investment in climate action in U.S. history it is not nearly enough to address the scale of the climate crisis. https://www.nlc.org/article/2022/08/08/historic-climate-clean-energy-bill-passes-senate/

[4] Why 16 Minnesota Cities Joined Together in a Climate Emergency Campaign. National League of Cities. Feb 2022. https://www.nlc.org/article/2022/02/10/why-16-minnesota-cities-joined-together-in-a-climate-emergency-campaign/

[5] President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target. 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/ Apr 22, 2021.

[6] Governor Walz, Lieutenant Governor Flanagan…Announce Plan to Achieve 100 Percent Clean Energy in Minnesota by 2040. https://mn.gov/governor/news/?id=1055-463873 Jan 21, 2021.

[7] NOAA National Centers for Environmental Information (NCEI) U.S. Billion-Dollar Weather and Climate Disasters (2022). https://www.ncei.noaa.gov/access/billions/, DOI: 10.25921/stkw-7w73

[8] *Id.*

[9] Commission Order Establishing 2020 and 2021 Estimate of Future Carbon Dioxide Regulation Costs. Sept. 30, 2020.

amount of the assumed regulatory price will better reflect the societal impact of generation assets and lead to greater accuracy in resource planning.

Should the Commission's update apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024?

We encourage the State to apply the update to electricity generation resource planning and acquisition proceedings in both 2023 and 2024 unless new federal rules or other developments necessitate modifying the ranges in 2024.

In summary, the City of Minneapolis agrees with the need for the consumer protections addressed by Minn. Stat. § 216H.06 since the possibility of future carbon pricing regulation continues to present an economic risk to Minnesota electricity customers. Generation assets built today are decades' long investments, and electricity customers may be highly impacted by future carbon-based pricing.

Minneapolis thanks the Agencies for consideration of our Comments. Please contact me or Stacy Miller at Stacy.Miller@minneapolismn.gov if you wish to discuss these recommendations further.

Respectfully submitted,

Kim W. Havey
Director
Division of Sustainability

STATE OF MINNESOTA)

) ss. **CERTIFICATE OF SERVICE**

COUNTY OF HENNEPIN)

I, Stacy A. Miller, of the City of Minneapolis, County of Hennepin, State of Minnesota, affirm that on the 31st day of August 2022, I served a copy of the following via e-mail and/or via U.S. Mail:

COMMENTS OF THE CITY OF MINNEAPOLIS regarding Docket No. E999/DI-22-236

at the last known mailing addresses and email addresses of said entities/individuals on the attached Service List.

Stacy A. Miller

_____

Stacy A. Miller

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In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06

Docket No. E999/DI-22-236
Docket No. E999/CI-07-1199

CLEAN ENERGY ORGANIZATIONS' COMMENTS
On Behalf Of

Fresh Energy
Minnesota Center for Environmental Advocacy
Sierra Club
Union of Concerned Scientists

August 31, 2022

TABLE OF CONTENTS

I. INTRODUCTION

These comments are offered by Fresh Energy, Minnesota Center for Environmental Advocacy, Sierra Club, and the Union of Concerned Scientists ("Clean Energy Organizations," or "CEOs"). We submit them in response to the June 30, 2022, Request for Comments issued by the Department of Commerce and the Minnesota Pollution Control Agency ("Agencies") regarding updating regulatory cost of carbon estimates.[1] For the reasons explained in the pages below, CEOs answer the Agencies' questions as follows:

1. **whether the currently established range of regulatory costs of CO2 emissions of $5 to $25 per short ton remains reasonable, and if not, what range should be established and why:**

   The current range of costs is far too low to capture the high end of carbon regulatory risk faced by Minnesota utilities. CEOs therefore recommend that the existing high-end estimate of $25/ton be replaced with the price of $75/ton, shown by the recent IMF study to be needed to achieve the less aggressive goal of the Paris Agreement (see part III).

   However, if the regulatory values remain lower than the Commission's externality values, CEOs urge that the externality values only be replaced up to the level of the regulatory values. The balance of the externality values should continue to be applied since it will not have been internalized by the regulatory costs (see part IV).

2. **whether 2025 is the appropriate threshold year for the application of the value range:**

   The appropriate threshold year should be kept at 2025 (see part VI).

3. **whether the application scenarios listed in the Commission's September 30, 2020 Order remain reasonable and appropriate:**

   The Commission should require an additional scenario that assumes the power sector will be required to undergo rapid decarbonization consistent with the US Nationally Determined Contribution under the Paris Agreement and with the Biden administration's target of carbon-free power by 2035 (see part V).

[1] Minnesota Department of Commerce and Minnesota Pollution Control Agency, *In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. §216H.06*, Request for Comments, Docket No. E999/DI-22-236, Docket No. E999/CI-07-1199 (June 30, 2022).

4. whether the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024:

The Commission should reassess its estimates in 2023 if the EPA's carbon rules are proposed or if other developments indicate the Commission's estimates are unrealistic (see part VII).

II. THE COMMISSION'S CARBON REGULATORY COST ESTIMATES SHOULD BE UPDATED TO REFLECT TODAY'S GHG REDUCTION POLICIES

Much has changed since the Public Utility Commission's (PUC's) last order establishing carbon regulatory costs, issued in September of 2020.[2] The climate crisis has intensifed, with more heat waves, droughts, wildfires, storms, and floods.[3] In the US alone we have experienced 56 billion-dollar-plus extreme weather and climate-related disasters over the past three years, totaling $315 billion in damages and causing 1030 deaths.[4] The world's response to the crisis has intensified as well, with a far broader commitment by nations and other entities to achieve net zero emissions by 2050 and to take other steps needed to limit warming to 1.5° C.[5]

In addition, the nation elected a president who made responding to the climate crisis a major goal of his administration. President Biden has since: returned the US to the Paris Agreement; submitted the U.S. Nationally Determined Contribution (NDC) under that agreement, pledging to cut US greenhouse gas (GHG) emissions by 50-52% by 2030 (below 2005 levels);[6] and set the goal of achieving net zero U.S. emissions economy-wide by 2050.[7] Of most relevance

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[2] Minn. Pub. Utils. Comm'n, *In the Matter of Establishing an Updated 2020 Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation under Minn. Stat. § 216H.06*, Order Establishing 2020 and 2021 Estimate of Future Carbon Dioxide Regulation Costs, Docket No. E-999/DI-19-406 (Sep. 30, 2020) [hereinafter "2020 Regulatory Costs Order"].

[3] *Climate change widespread, rapid, and intensifying*, IPCC (Aug. 9, 2021) *available at* https://www.ipcc.ch/2021/08/09/ar6-wg1-20210809-pr/.

[4] National Centers for Environmental Information, *Billion-Dollar Weather and Climate Disasters,* National Oceanic and Atmospheric Administration (accessed Aug. 29, 2022), *available at* https://www.ncei.noaa.gov/access/billions/.

[5] *Net Zero Targets*, Climate Action Tracker, *available at* https://climateactiontracker.org/methodology/net-zero-targets/.

[6] "The United States Nationally Determined Contribution: Reducing Greenhouse Gases in the United States: A 2030 Emissions Target," submitted to NDC registry April 22, 2021. https://unfccc.int/sites/default/files/NDC/2022-06/United%20States%20NDC%20April%2021%202021%20Final.pdf [hereafter, "US NDC"].

[7] Exec. Order 14,008, Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 7619, 7622 (Feb. 1, 2021).

to utility planning and this proceeding, Biden has established the policy goal of creating a carbon-free electric grid by 2035, describing this goal as "a crucial foundation for net-zero emissions no later than 2050."[8] The administration also established the interim target of 80% carbon-free electricity by 2030, making it part of the president's 2021 budget package.[9] While this was blocked in Congress, a series of studies emerged (discussed further below) showing that 80% carbon-free electricity by 2030 is a viable and important interim step on the path toward a carbon-free grid by 2035.[10]

Despite the accelerating climate crisis and President Biden's GHG reduction goals, Congress has still failed to enact carbon dioxide restrictions.[11] In addition, in June the U.S. Supreme Court imposed new limits on how the Environmental Protection Agency (EPA) can regulate carbon emissions from the power sector, preventing EPA's use of a generation-shifting trading approach as the basis for setting performance standards, such as EPA employed in its Clean Power Plan.[12] However, EPA retains its authority under section 111 of the Clean Air Act to limit carbon emissions from power plants based on the "best system of emissions reduction," as long as it defines that system based on inside-the-fenceline technologies, such as carbon capture and

[8] U.S. State Department and Executive Office of the President, *The Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050*, at 5 (Nov. 2021) available at https://www.whitehouse.gov/wp-content/uploads/2021/10/US-Long-Term-Strategy.pdf.

[9] *Id.* at 27; Dan Esposito, "Studies Agree 80 Percent Clean Electricity by 2030 Would Save Lives and Create Jobs at Minimal Cost," Energy Innovation, Sep. 2021, at 2, https://energyinnovation.org/wp-content/uploads/2021/09/Studies-Agree-80-Percent-Clean-Electricity-by-2030-Would-Save-Lives-and-Create-Jobs-at-Minimal-Cost.pdf [hereinafter "Esposito 2021"].

[10] Esposito 2021, *supra* note 9.

[11] However, the federal government did just impose, for the first time, a cost on greenhouse emissions. It did so in the form of a methane fee enacted under the Inflation Reduction Act, costing $900 per metric ton of methane, increasing to $1,500/ton by 2026. The fact that it was enacted with so little industry opposition and even some industry support has led some analysts to suggest it could pave the way for a future federal price of carbon dioxide. Scott Waldman, *Climate bill's methane fee could pave the way to a carbon tax.* E&E News (Aug. 11, 2022).

[12] *West Virginia v. EPA,* 597 U.S. ___ (June 30, 2022), slip opinion No. 20-1530, available here: https://www.supremecourt.gov/opinions/21pdf/20-1530_n758.pdf

storage (CCS). [13] In response to the Supreme Court's decision, EPA Administrator Michael Regan announced that his agency was "committed to using the full scope of EPA's authorities to protect communities and reduce the pollution that is driving climate change."[14] EPA's power plant climate rules for existing and new power plants are currently scheduled to be proposed in March of 2023.[15]

In addition to President Biden's goal of a carbon-free power grid by 2035, Governor Walz supports the only somewhat less ambitious goal of a carbon-free electric grid by 2040.[16] This 2040 goal is part of the draft Minnesota Climate Action Framework put together by the Walz administration's Climate Change Subcabinet, of which both the Department of Commerce and the Pollution Control Agency are members.[17] Walz is also a member of the U.S. Climate Alliance, a bipartisan coalition of 24 governors representing 54% of the US population and working to "achieve the goals of the Paris Agreement and keep temperature increases below 1.5 degrees Celsius."[18] More specifically, members are committed to reducing collective net GHG emissions at least 50-52 percent by 2030 (below 2005 levels) and to achieving net-zero emissions no later than 2050.[19] These GHG reductions are consistent with the goals of the Paris Agreement and with the US NDC.

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[13] 42 USC § 7411.
[14] *EPA Administrator Regan Issues Statement on West Virginia v. Environmental Protection Agency*, EPA (June 30, 2022), *available at* https://www.epa.gov/newsreleases/epa-administrator-regan-issues-statement-west-virginia-v-environmental-protection
[15] Stephen Lee and Jennifer Hijazi, *EPA Seen as Prepared for Big Challenges Ahead of Carbon Rules,* Bloomberg Law (July 7, 2022), *available at* https://news.bloomberglaw.com/environment-and-energy/epa-seen-as-prepared-for-big-challenges-ahead-of-carbon-rules
[16] 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 Energy in Minnesota by 2040* (Jan. 21, 2021), *available at* https://mn.gov/governor/news/?id=1055-463873.
[17] Climate Change Subcabinet, *Minnesota's Climate Action Framework,* Draft, at 45, https://climate.state.mn.us/sites/climate-action/files/2022-01/Climate%20Action%20Framework%20Draft_2.pdf.
[18] *Fact Sheet: Further. Faster. Together*, U.S. Climate Alliance, at 1 (Apr. 19, 2022), *available at* https://static1.squarespace.com/static/5a4cfbfe18b27d4da21c9361/t/62a258211d5eab2536b9d7ba/1654806561848/USCA+2022+Fact+Sheet.pdf
[19] *Id*. at 2.

We may not know how or when future carbon regulations will emerge, but we know that the carbon reduction targets currently at the center of the policy debate are far more ambitious than the carbon reductions upon which the Commission's regulatory cost estimates have for years been based. It is critical that future utility resource plans seriously consider the possibility that the utility will indeed be required to retire all its fossil fuel plants (or render them carbon-free) by 2035 or 2040. The regulatory cost estimates set by the Commission in 2020 reflect the science and the regulatory expectations of a different time. They should be updated to reflect the costs associated with today's state and national climate protection goals and GHG reduction policies.

III. THE AGENCIES SHOULD RECOMMEND INCREASING THE HIGH END OF THE COST-PER-TON ESTIMATE TO $75/TON

Multiple studies have shown that the current high regulatory cost of $25/ton is far too low to reflect the regulatory risk inherent in the nation's and the world's GHG reduction goals. If the only carbon regulations faced by utilities came in the form of a cost-per-ton of CO2, these studies show it would have to be far higher than $25/ton in order to achieve anything like the rapid decarbonization we need under the Paris Agreement.[20] A 2021 analysis by Wood Mackenzie found that it would take carbon prices of $160/metric ton by 2030 to cut GHGs in line with the world limiting warming to 1.5° C.[21] Another analysis, by the International Energy Agency, found that to achieve net zero energy-related CO2 emissions globally by 2050 required CO2 prices in advanced

[20] Under the Paris Agreement and the 2021 Glasgow Pact, the US and the other nations of the world agreed to hold warming to "well below 2° C" above preindustrial levels and purse efforts to limit warming to 1.5° C. After the Paris Agreement was signed in 2015, new research by the Intergovernmental Panel on Climate Change (IPCC) established the far greater dangers associated with 2° C warming, and the world has increasingly rallied around the safer limit of 1.5 ° C. The US NDC is based on cutting emissions in line with limiting warming to 1.5° C.

[21] Wood Mackenzie, *Significant Increase in Carbon Pricing is Key in 1.5-degree World*, (Mar. 4, 2021), available at https://www.woodmac.com/press-releases/significant-increase-in-carbon-pricing-is-key-in-1.5-degree-world/#:~:text=Wood%20Mackenzie%20Asia%20Pacific%20Head,at%20the%20end%20of%202020.%E2%80%9D [hereinafter "Wood Mackenzie 2021"].

economies of $130/metric ton in 2030, rising to $205/metric ton in 2040.[22] A third study, by the High-Level Commission on Carbon Prices in a report sponsored by the World Bank, found in 2017 that staying well below 2.0° C (the less ambitious Paris Agreement goal) would require carbon prices of at least $50-100/metric ton by 2030, if complemented by other well-designed policies.[23]

Most recently, a 2022 staff paper by the International Monetary Fund (IMF) assessed the impact of a carbon floor price of $75/metric ton by 2030 for high-income nations, finding it would be sufficient to reduce emissions in line with keeping warming below 2.0° C. Indeed, the IMF found that such a price floor "is the only feasible option out of all those we considered in the paper to prevent the planet from heating to dangerously high temperatures."[24]

Because the current high-cost estimate of $25/ton is so far from what is needed to reduce GHGs sufficiently, we urge the Agencies to recommend a substantially higher value for that upper cost. The IMF's estimate of carbon costs of $75/ton by 2030 would be a reasonable choice for the upper cost, given that it is a very recent estimate that presents a carbon cost sufficient to achieve at least the 2° C limit. It is still a conservative estimate for the upper edge of the cost range, given that the Biden administration is seeking emission reductions aimed at the much safer Paris Agreement goal of 1.5° C, which studies by the International Energy Agency and Wood Mackenzie found would require carbon costs of $130 to $160/metric ton by 2030 to achieve.[25] Moreover, according to the IMF, $75/ton should be a price *floor*, and the IMF stresses that many

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[22] *World Energy Model Documentation,* International Energy Agency, at 17 (Oct. 2021), *available at* https://iea.blob.core.windows.net/assets/932ea201-0972-4231-8d81-356300e9fc43/WEM_Documentation_WEO2021.pdf [hereinafter "IEA 2021"].

[23] High-Level Commission on Carbon Prices, *Report of the High-Level Commission on Carbon Prices*, The World Bank, (2017), at 3, 50*, available at* https://openknowledge.worldbank.org/handle/10986/32419. The High-Level Commission also found that carbon costs of $40-80/ton were needed by 2020.

[24] Jean Chateau, Florence Jaumotte and Gregor Schwerhoff, *Why Countries Must Cooperate on Carbon Prices,* IMFBlog (May 19, 2022). Article and staff paper available at https://blogs.imf.org/2022/05/19/why-countries-must-cooperate-on-carbon-prices-2/

[25] IEA 2021, *supra* note 22; Wood Mackenzie 2021, *supra* note 21.

countries might have to set higher prices to achieve their NDCs. Even so, carbon costs on a trajectory that hits $75/ton by 2030 are clearly a better reflection of the high end of the regulatory cost risk than a flat $25/ton.

We note that the IMF estimate comes very close to the current price ceiling set for the California cap-and-trade program. That figure is $72.29 for 2022, rising annually at five percent plus inflation.[26] It should be noted, however, that the California cap-and-trade program is not aimed at driving sufficient emission cuts to achieve the goals of the Paris Agreement or the US NDC, but was designed with weaker targets in mind.[27] And the IMF's proposed $75 by 2030 cost is lower than the cost that would be imposed by the most recent federal carbon fee bill proposed in Congress, the Save Our Future Act introduced by Senators Sheldon Whitehouse and Brian Schatz; that bill would impose a fee of $56/metric ton in 2023, rising annually at 6% plus inflation, which would yield a fee of well over $75 by 2030 even without the inflation adjustment.[28]

Raising the upper regulatory cost estimate in this way would send a strong and entirely appropriate signal to utilities that they face a much higher carbon regulatory risk than they did just a few years ago, and that they need to at the very least expand the scope of their planning in response. A lower regulatory cost estimate would be retained, reflecting the obvious potential for ongoing political deadlock around climate regulation. However, a $75/ton upper regulatory cost estimate would reflect the potential that the nation's science-based climate policies will actually be reflected in its carbon regulations. By contrast, leaving the upper estimate at $25/ton sends the

[26] California Air Resources Board, *Detailed Price Ceiling Sale Requirements and Instructions* (Dec. 31, 2021), *available at* https://ww2.arb.ca.gov/sites/default/files/cap-and-trade/pcs_requirements.pdf.
[27] Center for Law, Energy, and Environment, *California Climate Policy Fact Sheet: Cap-and-Trade*, University of California, Berkeley (2019), *available at* https://www.law.berkeley.edu/wp-content/uploads/2019/12/Fact-Sheet-Cap-and-Trade.pdf.
[28] *See Carbon Pricing Bill Tracker,* Resources for the Future (June 2021), *available at* https://www.rff.org/publications/data-tools/carbon-pricing-bill-tracker/.

message that the possibility that policymakers will successfully impose regulatory costs sufficient to achieve our climate goals is so remote that it is reasonable for utilities to ignore it in their long-term planning.

IV. THE EXTERNALITY CARBON COST VALUES SHOULD BE RETAINED UNTIL THEY ARE FULLY INTERNALIZED BY THE REGULATORY VALUES

Currently, in the reference cases and most of the cases and sensitivities presented in an IRP, once the carbon regulatory costs are applied in year 2025, the Commission's estimated externality costs completely disappear. This complete replacement of the externality values by the regulatory values runs counter to both the science underlying the externality costs and the fundamental economic concept of externalities.

The externality costs reflect the PUC's best estimate of the damage done to the environment by each ton of CO2 emitted. The externality costs were adopted in 2018 following lengthy and detailed proceedings and the values chosen are based on the federal Social Cost of Carbon (SCC).[29] The Commission found that the SCC was based on the "most credible and widely used sources of information in the scientific literature" and praised the "degree of rigor employed in the development of these cost values, and timeliness of the underlying data and analysis."[30] However, the Commission considerably reduced the upper value of the federally-estimated SCC by declining to use the 2.5% discount rate, the lowest of the three different rates employed at the federal level.[31] (For this and other reasons the upper value of the externality cost estimates used in

[29]Minn. Pub. Utils. Comm'n, *In the Matter of Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statutes Section 216B.2422. Subdivision 3.* Order Updating Environmental Cost Values. Docket No. E-999/CI-14-643 (Jan. 3, 2018) [hereinafter "2018 Externalities Order"].
[30] *Id.* at 15.
[31] *Id.* at 16.

Minnesota is lower than the upper values estimated in other states including Washington, California, New York, and Colorado.[32])

While Minn. Stat. § 216B.2422 refers to these values as "environmental costs," they are commonly known as externalities, and the Commission itself has described them this way. In its last order updating the costs it says that "[w]hen an economic activity imposes a cost or benefit on an unrelated third party, the cost or benefit is known as an economic external cost or 'externality.'" It went on to describe Minn. Stat. § 216B.2422, subd. 3, the statute requiring these cost estimates, as "in essence, … a requirement to determine the costs imposed on the public by pollution from power plants."[33]

The economic concept of externalities assumes that an externality can be "internalized," such as when a polluter pays for an allowance to pollute. The pollution and the damage it causes might continue, but at least the price of the product will now reflect the damage done. However, this is only true *up to the level of the allowance price*. If the damage done to the environment is higher than the regulatory price paid, the externality is only partially internalized.

Currently, the PUC's estimated range of carbon externality costs for the year 2025 ($10.07 to $46.96) is roughly twice as high as its estimated range of carbon regulatory costs for 2025 ($5.00 to $25.00) (see Figure 1). This means that no more than about half of the external costs created by

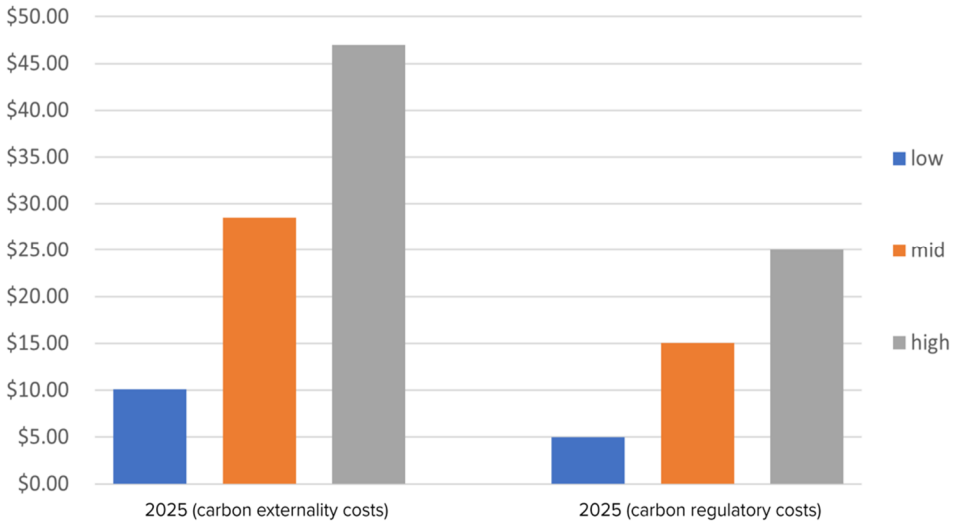
[32] *See e.g., Social Cost of Carbon,* Washington Utilities and Transportation Commission, *available at* https://www.utc.wa.gov/regulated-industries/utilities/energy/conservation-and-renewable-energy-overview/clean-energy-transformation-act/social-cost-carbon; Cal. Pub. Util. Comm'n, *Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning, and Evaluation of Integrated Distributed Energy Resources,* Decision Adopting Cost Effectiveness Analysis Framework Policies for All Distributed Energy Resources, Decision 19-05-019, at 41-42 (May 16, 2019); New York Department of Environmental Conservation, *DEC Announced Finalization of 'Value of Carbon' Guidance to Help Measure Impacts of Greenhouse Gas Emissions,* news release (Dec. 30, 2020), *available at* https://www.dec.ny.gov/press/122070.html; *Public Utilities Commission Modernize Gas Utility Demand-side Management Standards,* Colorado General Assembly, bill summary, *available at* https://leg.colorado.gov/bills/hb21-1238.

[33] 2018 Externalities Order*, supra* note 29*,* at 5.

a plant's carbon emissions in 2025 can be said to have been internalized by the imposition of the regulatory cost. The balance of the externality cost is in no way reflected in the price of electricity. There is therefore no basis for allowing the lower regulatory values to fully replace the higher externality values in the base case and most of the planning scenarios.

Figure 1. Carbon externality costs versus carbon regulatory costs.

The Commission's currently estimated carbon regulatory costs, assumed to begin in 2025, substitute for externality costs roughly twice as high.



By replacing higher externality values with lower regulatory ones in 2025 and beyond, it makes the portion of the total Present Value Social Cost (PVSC) associated with carbon emissions suddenly fall by almost half in 2025. It is inconceivable that the total cost to society associated with carbon emissions will be *going down* in a few years rather than up, and yet this assumption is baked into the reference case that utilities model and the sensitivities based on it.

The Commission first adopted the policy of allowing regulatory costs to substitute for externality costs in its initial order in 2007.[34] However, at the time, regulatory costs were far higher than externality costs, so they fully internalized the externality costs. Not until 2018, when externality costs were substantially raised, did externality costs exceed regulatory costs. In that year, the Commission acknowledged that when the externality costs exceed the regulatory ones, the challenge of reconciling the costs is placed in "sharper relief."[35] However the Commission chose to "avoid combining" the costs because it would pose "conceptual challenges" and "might be difficult for utilities to implement via their computer models."[36] Instead, the Commission fashioned a new policy directing utilities to consider multiple scenarios under a range of assumptions about externality values and regulatory values.

In its 2020 order estimating future regulatory costs, the Commission amended that policy by directing utilities to make sure that their reference scenarios included "at least the midpoint of the Commission-approved environmental and regulatory cost ranges," or the high end of these ranges.[37] Table 1 is taken from that order: (remaining of page left blank, see next page for Table 1)

[34] Minn. Pub. Utils. Comm'n, *In the Matter of Establishing an Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation under Minnesota Statutes § 216H.06,* Order Establishing Estimate of Future Carbon Dioxide Regulation Costs, Docket No. E-999/CI-07-1199, at 4 (Dec. 21, 2007).
[35] Minn. Pub. Utils. Comm'n, *In the Matter of Establishing an Updated 2016 Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06,* Order Establishing 2018 and 2019 Estimate of Future Carbon Dioxide Regulation Costs, Docket No. E-999/Di-17-53, at 10 (June 11, 2018).
[36] *Id.*
[37] 2020 Regulatory Costs Order, *supra* note 2, at 8.

Table 1.

Scenarios currently required by the Commission to be analyzed in resource acquisition proceedings.[38]

Scenarios:	Before 2025		2025 and Thereafter	
	Environmental Cost	Regulatory Cost	Environmental Cost	Regulatory Cost
Low Environmental Cost	Low End	-	Low End	-
High Environmental Cost	High End	-	High End	-
Low Environmental/ Regulatory Costs	Low End	-	-	$5/Ton
High Environmental/ Regulatory Costs	High End	-	-	$25/Ton
Reference Case Scenario	Middle to High End	-	Middle to High End	Middle to High End

Notably, this table does not in fact direct utilities to replace externality costs with regulatory costs in 2025 in the reference case scenario, but seems to order consideration of them both in 2025 and thereafter. However, the order does not explicitly state this, nor does it explain if those values should be added together. In practice, utilities have continued to entirely eliminate the externality costs after 2025 in their reference case scenario as well as in the other scenarios that include regulatory costs.[39] Only one in five scenarios envisions high environmental costs continuing beyond 2025, but that scenario, which assumes no regulatory costs, tends to be shunted to the margins of the planning process. In Minnesota Power's ongoing IRP proceeding, the high environmental costs scenario was so little valued that it was placed in a Supplemental Appendix K that was not even submitted to the PUC until two months after the original IRP filing.[40]

[38] *Id.*
[39] *See, e.g.,* Minnesota Power, *In the Matter of Minnesota Power's Application for Approval of its 2021-2035 Integrated Resource Plan,* 2021 Integrated Resource Plan, Docket No. EO15/RP21-33, at 33 (Feb. 1, 2021).
[40] Minnesota Power, *In the Matter of Minnesota Power's Application for Approval of its 2021-2035 Integrated Resource Plan,* 2021 Integrated Resource Plan, Supplemental Appendix K, Docket No. EO15/RP21-33, at 28 (Apr. 1, 2021).

CEOs therefore urge the Agencies to recommend that the Commission specify a new approach. When the regulatory costs are assumed to begin, they should be treated as a partial internalization of the externality cost. The externality cost should not disappear, but rather be reduced by the amount of the regulatory cost. For example, using the high regulatory costs and high externality costs currently in place for 2025, utilities would assume a $25/ton regulatory cost for every ton of CO2 emitted. This cost would appear in the scenario's Present Value Revenue Requirement (PVRR) total because, like any other operating cost, it would affect the utility's revenue requirement. Then, the 2025 externality cost would be reduced by $25/ton, yielding a remaining externality cost of $21.96 ($46.96 – 25.00) per ton of CO2 emitted, which would appear in the scenario's PVSC.

Our recommended approach of keeping the balance of the externality in place differs from the current scenarios that consider externalities without regulatory costs (the first two scenarios in Table 1). EnCompass, which is now the capacity expansion modeled used by many Minnesota utilities, treats the regulatory costs and externality costs very differently. Externality costs are added as an additional cost to the total Present Value of Revenue Requirements (PVRR)[41] for each scenario to arrive at a total PVSC value. This means that the externality costs do not have an impact on the dispatch of resources or the selection of new resources within the capacity expansion model. By contrast, regulatory costs are treated as a dispatch adder, or an additional cost, for operating carbon-emitting resources. This means that the regulatory cost does have an impact on the dispatch of units and can influence resources selected in the capacity expansion modeling. The regulatory cost is also included in the PVRR reported by EnCompass, and not added in as a post-modeling

[41] EnCompass reports the PVRR for each modeling run. The externality costs are calculated within EnCompass, but are for reporting purposes only, and are not included in the PVRR. The PVSC is calculated by adding the externality costs to the PVRR as an out of model calculation.

step like the externality cost. As for the three scenarios under Table 1 that now consider regulatory costs but then ignore externalities (including the reference scenario as it has been applied in practice), under our approach they would see their PVSCs rise because they would no longer ignore the uninternalized portion of the externality. This would make that very real ongoing societal cost visible, consistent with the science, with economic theory, and with the requirements of Minn. Stat. § 216B.2422, subd. 3.

Our proposed approach recognizes the existence of the ongoing and uninternalized externality cost but also recognizes the conceptual distinction between regulatory and externality costs and their different impacts on PVRR and PVSC. If the regulatory values are increased by the Commission to the level where they exceed the externality costs – as CEOs have recommended above for the high regulatory cost -- then the externalities would be considered completely internalized, and would no longer need to be applied.

We do not believe our recommended approach would be difficult for utilities to implement via their computer models, as the Commission expressed concern about in 2018. Utilities are already modeling regulatory and externality costs in different ways and adjusting the externality values when the regulatory values begin. Rather than reduce the externalities to zero, this new approach would simply have them reduce the externalities by the amount of the regulatory values.

We also do not believe this approach creates "conceptual challenges," because we are not proposing adding the regulatory and externality values together. Rather we propose retaining the uninternalized portion of the externality, which is an approach consistent with the economic concept of externalities and their internalization through regulation. Our approach would also

better reflect the scientific reality of a utility's carbon emissions continuing to cause environmental damage beyond what they are assumed to pay in regulatory costs.[42]

V. A NEW SCENARIO SHOULD BE ADDED THAT ASSUMES DECARBONIZATION OF THE POWER SECTOR WILL BE REQUIRED

There was a time when fully decarbonizing the U.S. electric grid in the foreseeable future was unthinkable. Now it is something every prudent utility must think about and start preparing a plan to achieve. However, none of the Commission's current five required planning scenarios comes close to requiring utilities to consider how they would achieve full decarbonization, despite a growing body of literature showing the importance of full or nearly full power sector decarbonization to combating the climate crisis. Indeed, the Commission's five regulatory scenarios may create a false sense of security among utilities and the public by requiring so much planning around dated and insufficiently ambitious climate regulatory futures.

The many studies considering how the nation can meet its climate targets all stress the importance of having the power sector decarbonize much faster than the other sectors.[43] This is partly because the power sector has more affordable and commercially available options than other sectors. It is also because the leading strategy for decarbonizing other energy-using sectors like

[42] CEOs note that the payment of a carbon price while continuing to emit does not eliminate the environmental damage of the emissions, nor does it necessarily compensate those harmed by the emissions, but it does at least yield a cost of electricity that reflects the damages, and under economic theory this should yield to more optimal patterns of production.

[43] *See e.g.* 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; 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; *Accelerating Decarbonization of the U.S. Energy System*, National Academies of Sciences, Engineering, and Medicine, The National Academies Press (2021), *available at* https://nap.nationalacademies.org/catalog/25932/accelerating-decarbonization-of-the-us-energy-system; Ben Haley et al., *Annual Decarbonization Perspective: Carbon-Neutral Pathways for the United States* 2022, Evolved Energy Research (2022), *available at* file:///C:/Users/barba/Downloads/Evolved%20ADP2022%208.19.pdf*; A Transformative Climate Action Framework: Putting People at the Center of Our Nation's Clean Energy Transition,* Union of Concerned Scientists (2021), *available at* https://www.ucsusa.org/resources/clean-energy-transformation.

transportation, industry, and buildings, is to have them replace their own fossil fuel use with electricity. The power sector, therefore, needs to both rapidly decarbonize and prepare to take on new energy loads from other sectors. This represents an enormous challenge for the power sector, but it will be a far more enormous challenge if utilities fail to plan for it now.

Given the urgent need to decarbonize the power sector, the PUC should require utilities to include in their integrated resource plans at least one rapid decarbonization scenario. We propose that utilities be required to include in their IRPs a plan that would allow them to achieve 80% carbon-free generation by 2030. This plan should be detailed enough to allow the utility to rapidly move ahead with the plan if required by law or by order of this Commission. It should specify which carbon-emitting resources it would retire and when, along with the size, type, and timing of carbon-free resources it would likely acquire. It should provide a general cost estimate, factoring in likely technological improvements and financial subsidies, and discuss why it considers its plan better than other decarbonization options. The plan should also discuss its technological options and preferences for eliminating all or nearly all of the remaining 20% of carbon-emitting resources by 2035, though it would not need to specify their cost.

Xcel Energy has already announced that it expects to achieve "nearly 80% of our power . . . from carbon-free sources by 2030,"[44] and several recent studies show that getting 80% of U.S. electricity from carbon-free sources by 2030 is technically and economically achievable. For example, a major analysis called *The 2030 Report,* by the Goldman School of Public Policy at the University of California, Berkeley, used a state-of-the-art capacity expansion and production cost modeling developed by the National Renewable Energy Laboratory (NREL) to assess the technical

[44] Xcel Energy, *Our Vision: Net-Zero Energy Provider by 2050* (2022), *available at* https://www.xcelenergy.com/staticfiles/xe-responsive/Clean-Energy-Transition-Highlights.pdf.

and economic feasibility of achieving 80% carbon-free electricity in the US by 2030.[45] It finds that an 80% clean grid would be dependable without coal plants and without new gas plants and despite aggressive electrification of the transportation sector.[46] Moreover, it finds that the cost to generate and deliver electricity in 2030 would be no more than today's,[47] and that moving to an 80% clean grid would avoid $1.7 trillion in health and environmental damages through 2050.[48] The study notes that "modeling of the U.S. NDC to reduce economy-wide emissions 50 percent from 2005 levels by 2030 converges with the need to reach at least 80% clean electricity by 2030."[49]

This report is just one of many that have reached similar conclusions about the viability and benefits of reaching 80% carbon-free power by 2030. A meta analysis of 11 recent studies modeling clean energy policy packages, including The 2030 Report, finds that they "collectively affirm that achieving 80 percent clean energy by 2030 is feasible, affordable, critical to meeting national climate goals, and deeply beneficial to the economy and public health – all without compromising power system reliability."[50]

We can expect that there will be additional technologies commercially available in the years after 2030 to enable utilities to achieve full decarbonization, and existing technologies will be cheaper as a result of both technological improvements and the cost reductions that come from mass production and deployment. The entire world is going to be working on decarbonization, with tremendous resources devoted to reducing the costs and improving the functioning of all forms of carbon-free technologies. For example, the Department of Energy has already launched

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[45] *2030 Report: Powering America's Clean Economy, A Supplemental Analysis to the 2035 Report*, Goldman School of Public Policy, at 2, 13 (April 2021), *available at* https://gspp.berkeley.edu/faculty-and-impact/centers/cepp/projects/2030-report-powering-americas-clean-economy.
[46] *Id*. at 3, 17-23.
[47] *Id.* at 4, 23-27.
[48] *Id*. at 5-6, 31-34.
[49] *Id*. at 2.
[50] Esposito 2021, *supra* note 9, at 2.

one program aimed at cutting the cost of long-duration grid-scale energy storage by 90% within the decade,[51] and another aimed at cutting the cost of clean hydrogen by 80% in one decade.[52] The recently-enacted Inflation Reduction Act[53] will not only reduce the costs of deployment of carbon-free energy and storage directly through major new subsidies but can be expected to drive future cost reductions by helping emerging technologies mature at an accelerated pace. There are also synergies with other sectors that could yield cost savings but which utilities' models, focused only on the power sector, do not capture. For example, recent deep decarbonization studies have shown that dynamic coupling between the electricity sector and industrial sector loads such as electrolyzers and boilers can reduce curtailment of wind and solar and lower the costs of electric fuels such as green hydrogen.[54]

Given the limitations of power-sector-only models and the uncertainty around the costs of achieving the last 10-20% of emission reductions, we do not propose at this time that utilities be asked to specify the costs of their plans for full decarbonization after 2030. We expect cost projections made today will greatly overestimate the costs of decarbonization technologies available after 2030. However, the utilities' rapid decarbonization plans should recognize the goal

[51] *Secretary Granholm Announces New Goal to Cut Costs of Long Duration Energy Storage by 90 Percent*, Department of Energy (July 14, 2021), *available at* https://www.energy.gov/articles/secretary-granholm-announces-new-goal-cut-costs-long-duration-energy-storage-90-percent.
[52] *Secretary Granholm Launches Hydrogen Energy Earthshot to Accelerate Breakthroughs Toward a Net-Zero Economy,* Department of Energy (June 7, 2021), *available at* https://www.energy.gov/articles/secretary-granholm-launches-hydrogen-energy-earthshot-accelerate-breakthroughs-toward-net.
[53]The Inflation Reduction Act was enacted as H.R. 5376. The official text of H.R. 5376, published by the Government Publishing Office, is available at https://www.govinfo.gov/content/pkg/BILLS-117hr5376enr/pdf/BILLS-117hr5376enr.pdf. *See also, Inflation Reduction Act (IRA) Summary: Energy and Climate Provisions,* Bipartisan Policy Center (Aug. 4, 2022), *available at* https://bipartisanpolicy.org/blog/inflation-reduction-act-summary-energy-climate-provisions/.
[54] Ben Haley et al., *Annual Decarbonization Perspective: Carbon-Neutral Pathways for the United States* 2022, Evolved Energy Research at 66 (2022), *available at* file:///C:/Users/barba/Downloads/Evolved%20ADP2022%208.19.pdf.

of full or virtually full decarbonization by 2035 and not include any long-term resource investments that would preclude achieving it.

CEOs recognize that this is a deviation from the Commission's past approach to expected carbon regulations. However, given the unfolding climate crisis, today's far more ambitious GHG reduction targets, and growing demands for full and rapid power sector decarbonization, we believe this deviation is not only reasonable but necessary. Long-term utility plans should not ignore future policies that scientists say are key to meeting globally-agreed climate goals, that researchers say are feasible, and that policymakers including the US President are actively pursuing. Requiring utilities to consider such a scenario and have a plan to respond to it is entirely within the spirit of Minn. Stat. § 216H.06, which clearly reflects the legislature's desire that utilities plan with future climate regulation firmly in mind. Requiring utilities to include a rapid decarbonization scenario also falls within the Commission's statutory authority to approve, reject, or modify a utility's IRP based on whether it is consistent with the public interest.[55] The Commission cannot judge whether a plan is in the public interest if it cannot tell whether the plan aligns with the broader effort to avoid catastrophic climate changes.

Currently, utilities are not planning a rapid enough decarbonization of their systems. In effect, all the versions of the future they are planning around are futures that fail to achieve the carbon reductions needed to achieve climate protection goals. It is not in the public interest to allow utilities to consistently assume we will fail in our efforts to combat the climate crisis, especially when that assumption perpetuates dependence on fossil fuels and thereby makes that failure more likely.

[55] Minn. Stat. § 216B.2422.

VI. THE COMMISSION SHOULD RETAIN THE THRESHOLD YEAR 2025 FOR ASSUMED CARBON COSTS-PER-TON

The enactment or adoption of laws imposing a cost-per-ton of carbon by 2025 may seem implausible in 2022. However, given the accelerating climate crisis and the urgent need to cut emissions deeply by 2030 in order to limit warming to 1.5° C, it is not unreasonable to expect some form of regulatory action imposing costs in the mid-2020s.

To a certain extent the carbon regulatory cost-per-ton values can function as a proxy for future carbon regulations that may not appear as a gradually-rising yet modest stream of annual costs (as the current estimates assume) but rather as a single, much larger retrofit cost. As noted, the EPA is planning to propose regulations for new and existing power plants in March of 2023. These regulations may, for example, require plants to commence constructing carbon capture and storage capabilities within just a few years after the rule is adopted.

For these reasons, we recommend that the Commission keep in place the 2025 date for the onset of future carbon regulatory costs. Postponing the date would send the message that utilities can count on a longer future period of cost-free carbon emissions, and it would not encourage the prudent planning Minnesota needs given national and state decarbonization goals.

VII. THE UPDATED VALUES SHOULD BE REASSESSED IN 2023 IF THE EPA'S CARBON RULES ARE PROPOSED OR IF OTHER DEVELOPMENTS INDICATE THE COMMISSION'S ESTIMATES ARE UNREALISTIC

The EPA is currently preparing rules that would address the carbon emissions of both existing and new fossil fuel plants. An EPA spokesperson stated, after the West Virginia v. EPA decision, that the agency "will continue to conduct outreach in 2022 on greenhouse gas rules for new and existing power plants and propose further rulemaking under Clean Air Act section 111 in

early 2023."[56] If the EPA keeps to this schedule, it would make sense for the Commission to reopen this docket in 2023. If not, and if no other developments indicate that the Commission's estimates are unrealistic, then the estimates should apply to proceedings initiated in both 2023 and 2024.

Dated: August 31, 2022

/s/Barbara Freese
Barbara Freese
Minnesota Center for Environmental Advocacy
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Attorney for Clean Energy Organizations

[56] Stephen Lee and Jennifer Hijazi, *EPA Seen as Prepared for Big Challenges Ahead of Carbon Rules*, Bloomberg Law (July 7, 2022), *available at* https://news.bloomberglaw.com/environment-and-energy/epa-seen-as-prepared-for-big-challenges-ahead-of-carbon-rules.

Community Power
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August 31st, 2022

TO: The Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Commerce, Division of Energy Resources (Department) (together, "the Agencies")"

RE: In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06
Docket No. E999/DI-22-236, Docket No. E999/CI-07-1199 -

Community Power, Cooperative Energy Futures, and Minnesota Renewable Now respectfully submit the following comments into the record. The Agencies have requested responses on the following questions to guide the development of their recommendations to the Public Utilities Commission. Our answers to the first two of these questions are provided below.

BACKGROUND OF COMMENTERS:

Community Power is an energy democracy organization focused on building the capacity of local residents and community-based organizations in Minnesota to participate and shape decisions about energy towards a clean, locally resilient, equitable, affordable and reliable future. We engage Minnesotans in deepening understanding of the energy system so that they may intervene in decisions that impact themselves and their communities, not just passive consumers and rate-payers to utilities.

Cooperative Energy Futures is a member-owned and controlled solar energy developer that focuses on membership from historically disadvantaged populations and low-to moderate income households. By working with underserved and low-income communities - as well as the general public - we create real community wealth by reducing energy use and producing our own clean, renewable energy. CEF sees communities as central to building and implementing solutions.

MN Renewable Now is working through the lens of environmental and climate justice towards a carbon free future by starting with those who are the most vulnerable to the effects of climate change. Engaging thousands of North Minneapolis residents about renewable energy, we have been able to convert the electricity consumption of over 100 households to renewable energy since October 2019, and 50 energy efficiency audits and installations in households located in North Minneapolis. This lowered heating/cooling bills by 10-30%, water bills by 30%, and saved each household over $500 on their electric bills annually.

QUESTIONS AND RESPONSES:

***Question 1*: Whether the currently established range of regulatory costs of CO2 emissions of $5 to $25 per short ton remains reasonable, and if not, what range should be established and why;**

This number ($25 per ton) is insufficient to reflect the real regulatory costs of CO2 emissions, and to steward the economic and public interests for which regulation is intended. The adopted cost of CO2 should be increased to, at minimum, $42/ton (dated from 2022) in order to be aligned with scientific evidence, and other policy-makers' findings. This cost should also be scaled up each year beyond that to reflect the exponentially increasing costs of delayed action to curb CO2 emissions. On its face, $25 could be taken as an ambitious proposal simply based on a comparison of what has been used thus far in Minnesota ($5/ton). But looked at in comparison to peers or, more importantly, rigorous scientific evidence about what must be done, it is alarmingly inadequate. Many respected local, US, and international analytical agencies have estimated the social cost of carbon significantly higher than both what Minnesota has only relatively recently adopted, and still nearly double what is proposed here ($25/ton). **At this time, we recommend a floor price in line with experts' analysis of the regulatory cost: $50/ton be adopted in 2023, and increased each year after at the cost of inflation plus a relevant amount that achieves a per ton cost in the range of $60-152 by 2030 in 2023 dollars.** If any delay in implementation of this cost is added beyond 2023, we recommend it begins at a *higher* cost than the original scale-up to reflect the exponential nature of the damages caused by waiting (e.g. if the amount would have been $55/ton in 2025 if a $50/ton cost was added in 2023, then it would need to be a $65 or $70/ton cost if the start of implementation was 2025).

Supporting evidence:

- The IPCC cites carbon pricing as a key strategy to reduce emissions on a timescale that prevents and mitigates the catastrophic damages from climate change, writing: "Policies reflecting a high price on emissions are necessary in models to achieve cost-effective 1.5°C pathways (high confidence)." [1] The report identifies that for pathways with a two-in-three chance of meeting the 2 degrees celsius outer limit, the carbon price is ~$90/ton, with a range of $60-120 in 2030 and $210/ton in 2050 with a range between $140-$340. For pathways that hold warming to 1.5C with no or limited overshoot (and have a one-in-two chance of doing so) the price is around $220/ton (range: $170-290) in 2030 and $630/ton (range: $430-990) in 2050. In general, the authors say that while costs increase with how much mitigation occurs, they "are reduced when energy demand is moderated through energy efficiency and lifestyle changes, when sustainable transport policies are implemented,

[1] IPCC Chapter 2 - https://www.ipcc.ch/sr15/chapter/chapter-2/

and when international technology cooperation is fostered." [2] The language in the most recent IPCC report also calls out 1) the importance of aggressive targets of reductions 2) swift, consistent government and policy action including regulatory pricing on carbon, and 3) the inequities in who contributes to emissions based on wealth landing significant responsibility with US actors:

> *"Pathways consistent with 1.5°C of warming above pre-industrial levels can be identified under a range of assumptions about economic growth, technology developments and lifestyles. However, lack of global cooperation, lack of governance of the required energy and land transformation, and increases in resource-intensive consumption are key impediments to achieving 1.5°C pathways**. Governance challenges have been related to scenarios with high inequality and high population growth in the 1.5°C pathway literature.** {2.3.1, 2.3.2, 2.5}* [3]

> *"Under emissions in line with current pledges under the Paris Agreement (known as Nationally Determined Contributions, or NDCs), global warming is expected to surpass 1.5°C above pre-industrial levels, even if these pledges are supplemented with very challenging increases in the scale and ambition of mitigation after 2030 (high confidence). **This increased action would need to achieve net zero CO2 emissions in less than 15 years.** Even if this is achieved, temperatures would only be expected to remain below the 1.5°C threshold if the actual geophysical response ends up being towards the low end of the currently estimated uncertainty range. Transition challenges as well as identified trade-offs can be reduced if global emissions peak before 2030 and marked emissions reductions compared to today are already achieved by 2030 {2.2, 2.3.5, Cross-Chapter Box 11 in Chapter 4}."*[4]

> ***"Policies reflecting a high price on emissions are necessary in models to achieve cost-effective 1.5°C pathways (high confidence).** Other things being equal, modelling studies suggest the global average discounted marginal abatement costs for limiting warming to 1.5°C being about 3–4 times higher compared to 2°C over the 21st century, with large variations across models and socio-economic and policy assumptions. **Carbon pricing can be imposed directly or implicitly by regulatory policies.** Policy instruments, like technology policies or performance standards, can complement explicit carbon pricing in specific areas. {2.5.1, 2.5.2, 4.4.5}"*[5]

> *Regional contributions to global GHG emissions continue to differ widely. Variations in regional, and national per capita emissions partly reflect different development*

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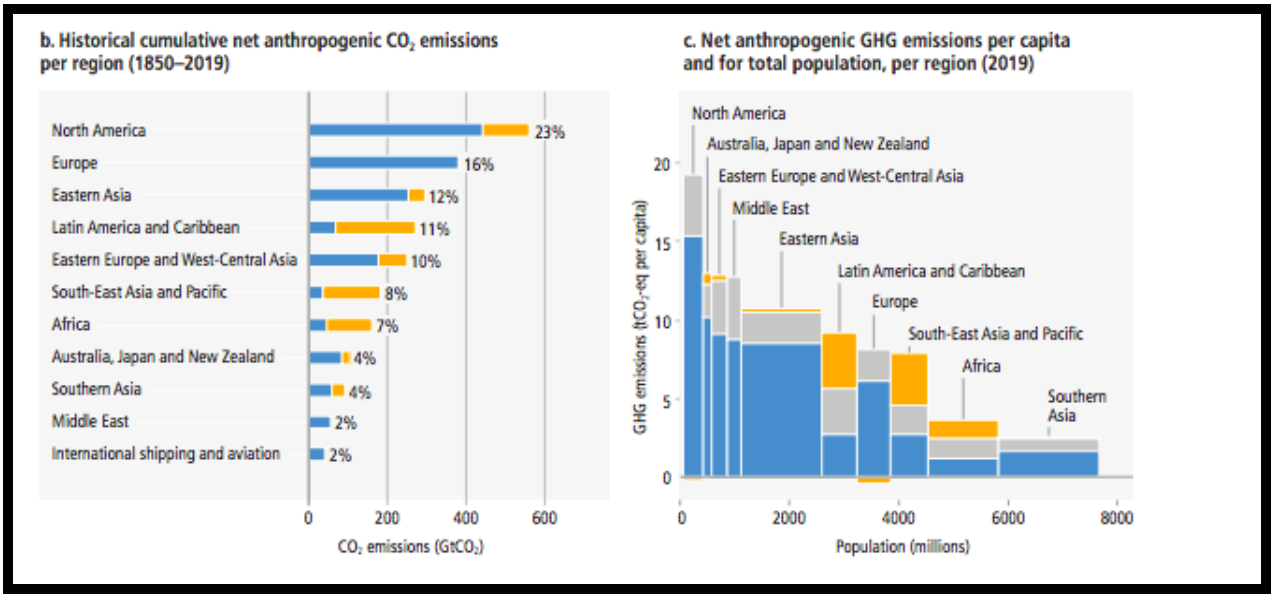
[2] "In-depth Q&A: The IPCC's sixth assessment on how to tackle climate change" Multiple authors. April 2022. https://www.carbonbrief.org/in-depth-qa-the-ipccs-sixth-assessment-on-how-to-tackle-climate-change/

[3] IPCC Chapter 2 - https://www.ipcc.ch/sr15/chapter/chapter-2/

[4] IPCC Chapter 2 - https://www.ipcc.ch/sr15/chapter/chapter-2/

[5] IPCC Chapter 2 - https://www.ipcc.ch/sr15/chapter/chapter-2/

stages, but they also vary widely at similar income levels. ***The 10% of households with the highest per capita emissions contribute a disproportionately large share of global household GHG emissions.*** *[...] (high confidence) (Figure SPM.2) {Figure 1.1, Figure 2.9, Figure 2.10, Figure 2.25, 2.2, 2.3, 2.4, 2.5, 2.6, Figure TS.4, Figure TS.5}*[6]



- The White House, has similarly set clear regulatory frameworks to understand this issue and price carbon in a manner that reflects the impact on society of continued emissions:

> *"Executive Order 12866 requires agencies, to the extent permitted by law, "to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs."* ***The purpose of the social cost of carbon (SC-CO2) 1 estimates presented here is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO2) emissions into cost-benefit analyses of regulatory actions."***[7]

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[6] "Summary for Policymakers: Climate Change 2022 Mitigation of Climate Change." *Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* 2022. https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SPM.pdf

[7] "Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866" Authors: Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, with collaboration from the Dept. of Energy and multiple other agencies. August 2016. P. 4 https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc_tsd_final_clean_8_26_16.pdf

Below are a table and a chart from the White House in 2016 - now a few years outdated, but still more ambitious than the proposal here - capturing the social cost of carbon per ton for years 2010 - 2050 (in 2007 dollars).

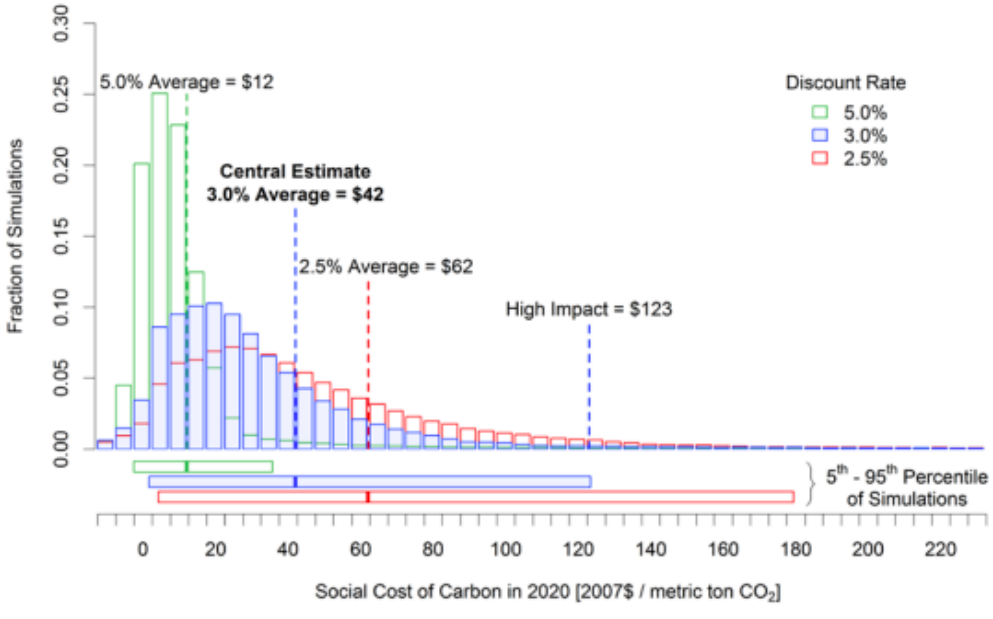
For purposes of capturing uncertainty around the SC-CO_2 estimates in regulatory impact analysis, the IWG emphasizes the importance of considering all four SC-CO_2 values.

Table ES-1: Social Cost of CO_2, 2010 – 2050 (in 2007 dollars per metric ton of CO_2)

Year	5% Average	**3% Average**	2.5% Average	High Impact (95th Pct at 3%)
2010	10	**31**	50	86
2015	11	**36**	56	105
2020	12	**42**	62	123
2025	14	**46**	68	138
2030	16	**50**	73	152
2035	18	**55**	78	168
2040	21	**60**	84	183
2045	23	**64**	89	197
2050	26	**69**	95	212

Note: the percentages at the top refer to the discount rate.

Figure ES-1: Frequency Distribution of SC-CO_2 Estimates for 2020[3]



In short, the thrust of what experts are beginning to quantify here is what the real human impacts have been and will be in the future. The real world impacts of climate change are becoming rapidly more apparent (e.g. increasing storms, longer and worsened wildfire seasons, threatened water supplies and water compacts, geopolitical distress and conflict over resources and corresponding massive climate refugee migrations, etc.). These impacts are also creating unexpected impacts (e.g. the economic impact of Winter Storm Uri as a financial cost that will cost MN households hundreds of millions from a *single* bad weather event). Climate change interacts with economic and infrastructure vulnerability in unpredictable ways, and it is clear our current approach has not adequately incentivized us to take the problem seriously enough.

***

Question 2: Whether 2025 is the appropriate threshold year for the application of the value range;

As it stands, Minnesota is already significantly behind on when this change in estimated cost of carbon was needed to account for and plan around the social cost of carbon. This cost should be adopted 60 days from PUC ruling, or at the latest in Q2 of 2023. The US - inclusive of Minnesota - bears a disproportionate responsibility for greenhouse gas emissions globally, and all agencies must work diligently to take right-sized responsibility for curbing emissions now.

CLOSING

Attaching a sufficient, real-world cost to carbon is a must, and it should be done so in light of how long we have delayed action, how much responsibility we bear globally, and the substantial and largely immeasurable catastrophic risks we face. And - carbon is just one of a series of climate drivers; methane and other greenhouse gasses currently have no price attached to them. These should receive similar treatment - with the Agencies' support and advocacy - at the Commission as soon as possible.[8]

We thank the Agencies for the opportunity to comment on this foundational issue that reflects our assumptions about the true costs to our communities so that we may make business decisions that reflect reality.

[8] IPCC Chapter 2 - "Limiting warming to 1.5°C implies reaching net zero CO2 emissions globally around 2050 and concurrent deep reductions in emissions of non-CO2 forcers, particularly methane (high confidence)." https://www.ipcc.ch/sr15/chapter/chapter-2/

/s/ Alice Madden
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/s/ Pouya Najmaie
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STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation under Minn. Stat. §216H.06	Docket No. E999/DI-22-236 Docket No. E999/CI-07-1199

COMMENTS OF GREAT RIVER ENERGY

Great River Energy (GRE) appreciates the opportunity to provide comments in this matter as requested by Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Commerce, Division of Energy Resources (DOC) in their Request for Comments letter dated June 30, 2022. GRE provides its comments on the range of cost estimates for the future cost of carbon dioxide (CO_2) regulation on electricity generation.

GRE neither supports nor opposes the continued use of $5 to $25 per short ton, with a midpoint of $15 per short ton. From an organizational perspective, GRE is on track to eliminating its carbon risk to its membership and is not contemplating the addition of fossil fuel resources that would be significantly impacted by a regulatory cost of carbon. GRE's current portfolio is on track to reduce carbon emissions by nearly 90% by 2032, while rate projections are lower than forecasts prior to the portfolio changes that led to the decarbonized power supply of today.

Similarly, GRE neither supports nor opposes the use of 2025 as the appropriate threshold year for application of the value range. The passage of the Inflation Reduction Act (IRA) at the federal level will create significant market incentives for the continued transition away from fossil fuel resources and for the continued growth of renewable resources, storage, and carbon-free baseload assets. The effective date of a future cost of carbon regulation continues to be uncertain as the industry has reduced its carbon emissions over the last 10 years, with coal assets being replaced or planned for replacement by renewable resources and other lower carbon emitting assets. These steps will only be accelerated by the IRA which will create further uncertainty for an effective date of a hypothetical federal carbon governance policy.

GRE will comply with any order the PUC puts forth regarding modeling future regulatory cost of CO_2 and does not expect to see substantial impacts to its current or future resource decisions as a result.

Finally, GRE finds the application scenarios previously listed in the Commission's September 30, 2020 Order reasonable and appropriate for resource planning proceedings in both 2023 and 2024.

If you have any questions, please contact me at zruzycki@grenergy.com or at 763-445-6116.

Sincerely,

GREAT RIVER ENERGY

/s/ Zac Ruzycki

Zac Ruzycki
Director, Resource Planning

c: Service List

minnesota power
AN ALLETE COMPANY

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August 31, 2022

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

Re: In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06
Docket Nos. E999/DI-22-236, E999/CI-07-1199

Dear Mr. Seuffert:

Minnesota Power (or "the Company") submits these comments in response to the Minnesota Pollution Control Agency and Minnesota Department of Commerce's ("Agencies") June 30, 2022, request for comments regarding the range of cost estimates for the future cost of carbon dioxide (CO2) regulation on electricity generation. The Request identified the topics open for comment. Minnesota Power's responses to those comments are outlined below.

COMMENTS

Whether the currently established range of regulatory costs of CO2 emissions of $5 to $25 per short ton remains reasonable, and if not, what range should be established and why.

Minnesota Power does not object to the currently established range of regulatory costs of CO2 emissions of $5 to $25 per short tons which remainsreasonable for planning purposes.

Whether 2025 is the appropriate threshold year for the application of the value range.

The Company does not object to 2025 as the appropriate threshold year for the application of the value range.

Whether the application scenarios listed in the Commission's September 30, 2020 Order remain reasonable and appropriate.

The application scenarios listed in the Commission's Order remain reasonable and appropriate at this time.

Whether the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024.

Minnesota Power believes the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in both 2023 and 2024.

The Company appreciates the opportunity to comment on this topic. If you have any questions regarding this filing, please contact me at 218.355.3602 or avang@mnpower.com.

Sincerely,

Ana Vang
Public Policy Advisor

AMV:th

STATE OF MINNESOTA	)	AFFIDAVIT OF SERVICE VIA
	) ss	ELECTRONIC FILING
COUNTY OF ST. LOUIS	)	

Tiana Heger of the City of Duluth, County of St. Louis, State of Minnesota, says that on the 31st day of August, 2022, she served Minnesota Power's Comments in **Docket Nos. E999/DI-22-236 and E999/CI-07-1199** on the Minnesota Public Utilities Commission and the Energy Resources Division of the Minnesota Department of Commerce via electronic filing. The persons on E-Docket's Official Service List for this Docket were served as requested.

Tiana Heger

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August 31, 2022

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

RE: In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. SS 216H.06
Docket Nos. E999/DI-22-236 & E999/CI-07-1199
Comments

Dear Mr. Seuffert:

Otter Tail Power Company (Otter Tail) hereby submits to the Minnesota Public Utilities Commission (Commission) its Comments in the above-referenced matter.

We have electronically filed this document with the Commission and copies have been served on all parties on the attached service list. A Certificate of Service is also enclosed.

Please contact me at 218-739-8989 or njensen@otpco.com if you have any questions regarding this filing.

Sincerely,

/s/ NATHAN JENSEN
Nathan Jensen
Resource Planning Manager

kaw
Enclosures
By electronic filing
c: Service List

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06	**Docket Nos. E999/CI-07-1199** **E999/DI-22-236** **Comments**

I. INTRODUCTION

Otter Tail Power Company (Otter Tail) submits these Comments in response to the June 30, 2022, Request for Comments by the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Commerce, Division of Energy Resources (Department) (together, the Agencies) in the above-captioned matter. The Agencies' Request for Comments invited comments on the range of cost estimates for future cost of carbon dioxide (CO2) regulation on electricity generation.

II. OTTER TAIL RESPONSES

Whether the currently established range of regulatory costs of CO2 emissions of $5 to $25 per short ton remains reasonable, and if not, what range should be established and why;

Otter Tail agrees that the regulatory cost range of $5 to $25 per ton of CO2 emissions is reasonable and continues to favor that Commission established range. Otter Tail does not recommend any other range or ranges for the costs of future carbon regulation.

Whether 2025 is the appropriate threshold year for the application of the value range;

It is Otter Tail's opinion that using a start date of 2028 is more appropriate than 2025. It will in all likelihood take several years to get a CO2 reduction plan developed and approved, and likely an additional period of years after that before compliance is required. Despite our preference being 2028, we do not feel that 2025 is unreasonable and would support that as the date of CO2 costs begin to be applied.

Whether the application scenarios listed in the Commission's September 30, 2020 Order remain reasonable and appropriate;

Otter Tail recommends that the Commission continue to direct the utilities to evaluate generation resources under a variety of scenarios using regulatory costs as approved by the Commission in its September 30, 2020 Order Updating Environmental Costs in Docket No. E-999/CI-14-643, In the Matter of the Further investigation into Environmental and Socioeconomic Costs Under Minnesota Statues Section 216B.2422, Subdivision 3, which also incorporated consideration of environmental costs, as set forth in Attachment A.

Whether the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024

Otter Tail recommends that the update should apply to both 2023 and 2024.

III. CONCLUSION

Otter Tail recommends the continued use of a range of $5 to $25 per ton of CO2 emitted. We also recommend no change be made in the way to the application scenarios listed in the Commission's September 30, 2020, Order. Otter Tail recommends the range and start time be applied for a two-year time period covering both 2023 and 2024.

If you have any questions regarding these comments, please feel free to contact Nathan Jensen at njensen@otpco.com or 218-739-8989.

Dated: August 31, 2022

Sincerely,

OTTER TAIL POWER COMPANY

By: */s/ NATHAN JENSEN*

Nathan Jensen
Manager, Resource Planning
Otter Tail Power Company
215 S. Cascade Street
Fergus Falls, MN 56537
(218) 739-8989
njensen@otpco.com

CERTIFICATE OF SERVICE

RE: In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. SS 216H.06
Docket Nos. E999/DI-22-236 & E999/CI-07-1199

I, Kim Ward, hereby certify that I have this day served a copy of the following, or a summary thereof, on Will Seuffert and Sharon Ferguson by e-filing, and to all other persons on the attached service list by electronic service or by First Class Mail.

Otter Tail Power Company
Comments

Dated this **31st** day of **August, 2022**.

/s/ KIM WARD
Kim Ward
Lead Regulatory Filing Coordinator
Otter Tail Power Company
215 South Cascade Street
Fergus Falls MN 56537
(218) 739-8268

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401 Nicollet Mall
Minneapolis, MN 55401

August 31, 2022

—Via Electronic Filing—

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

RE: COMMENTS
ESTIMATED COSTS OF FUTURE CARBON DIOXIDE REGULATION ON ELECTRICITY GENERATION
DOCKET NOS. E999/CI-07-1199; E999/DI-19-406; AND E999/DI-22-236

Dear Mr. Seuffert:

Northern States Power Company, doing business as Xcel Energy, submits these comments in response to the June 30, 2022 Request for Comments by the Minnesota Pollution Control Agency and Minnesota Department of Commerce, Division of Energy Resources (together, the Agencies). The Agencies invite comments on the range of cost estimates for the future cost of carbon dioxide (CO_2) regulation on electricity generation – specifically:

- whether the currently established range of regulatory costs of CO_2 emissions of $5 to $25 per short ton remains reasonable, and if not, what range should be established and why;
- whether 2025 is the appropriate threshold year for the application of the value range;
- whether the application scenarios listed in the Commission's September 30, 2020 Order remain reasonable and appropriate; and
- whether the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024

In summary, the Company believes the upper range of the regulatory costs of CO_2 should be raised to $30 per short ton to maintain consistency with existing carbon markets and suggests updating the cost range to $5 to $30 beginning in 2025. The Company further believes it would be reasonable to retain the application scenarios as currently ordered, and that it would be reasonable to apply all these parameters to

electricity generation resource planning and acquisition proceedings initiated in both 2023 and 2024. In the event that the federal or state CO_2 regulatory landscape shifts more quickly than expected, making aspects of these parameters no longer reasonable, the Commission would have discretion to reopen the docket sooner than 2025.

A. Background

Minn. Stat. § 216H.06 requires the Minnesota Public Utilities Commission to "establish an estimate of the likely range of costs of future carbon dioxide regulation on electricity generation." The estimate, which may be made in a Commission Order, must be used in all electricity generation resource acquisition proceedings. The Commission last updated its CO_2 regulatory cost range in September 2020, adopting a range of $5 to $25 per short ton of CO_2, applied beginning in 2025, for resource planning and acquisition proceedings initiated in both 2020 and 2021.[1]

The CO_2 regulatory cost range is intended as a proxy for regulatory costs that utilities and their customers may face, beginning in the year they are expected to incur these costs, so that resource planning and acquisition decisions can consider the impacts of those costs on long-term capital investments. This cost range is meant to capture regulatory costs only. Societal damages from climate change are separately addressed using the CO_2 environmental cost range under Minn. Stat. §216B.2422, subd. 3. The CO_2 regulatory cost range is applied in resource planning models as a cost faced by any fossil generation resource, affecting both the dispatch of resources and expansion plan choices. Use of CO_2 regulatory costs results in a Present Value of Societal Cost (PVSC) ranking of resource plan alternatives that differs from the Present Value of Revenue Requirements (PVRR) ranking. All else equal, a portfolio with more CO_2-emitting generation will have a higher PVSC than one with less CO_2-emitting generation. PVSC is one of the factors utilities and the Commission consider in assessing preferred resource alternatives and portfolios.

When the Commission adopted the range of $5 to $25 per ton in its last update, it considered a variety of factors including actual CO_2 allowance prices at that time in the Western Climate Initiative (WCI) and Regional Greenhouse Gas Initiative (RGGI) carbon markets; modeling of possible CO_2 allowance prices under the EPA's Clean Power Plan (CPP); and the possibility that future regulatory approaches at the federal, regional, or state level might impose greater regulatory costs than the indicative carbon prices in WCI, RGGI, or the CPP.

The Commission specified five scenarios that utilities must consider in all electricity

[1] ORDER ESTABLISHING 20EW3 AND 2021 ESTIMATE OF FUTURE CARBON DIOXIDE REGULATION COSTS. *In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06*. September 30, 2020. Docket Nos. E-999/DI-17-53 and Docket No. E-999/CI-07-1199.

generation resource acquisition proceedings during 2020 and 2021:

A. Incorporate, for all years, the low end of the range of environmental costs for CO_2 as approved by the Commission in its January 3, 2018 Order Updating Environmental Costs in Docket No. E-999/CI-14-643;
B. Incorporate, for all years, the high end of the range of environmental costs for CO_2;
C. Incorporate the low end of the range of environmental costs for CO_2 but substituting, for planning years after 2024, the low end of the range of regulatory costs for CO_2 regulations, in lieu of environmental costs;
D. Incorporate the high end of the range of environmental costs for CO_2 but substituting, for planning years after 2024, the high end of the range of regulatory costs for CO_2 regulations, in lieu of environmental costs;
E. A reference case scenario incorporating the Commission's middle or high values of the established environmental and regulatory cost ranges.

Accordingly, the Company used all five scenarios in our recently filed 2020-2034 Upper Midwest Integrated Resource Plan. Option D – high CO_2 environmental costs through 2024, high CO_2 regulatory costs thereafter – was selected as the basis of our primary PVSC scenarios and we conducted analysis on the remaining options as sensitivities.[2] The Company also provides sensitivities that examine future scenarios with no CO_2 costs incorporated – or our PVRR cases – as a comparison point, although it is no longer required in Minnesota resource planning or acquisition filings.[3]

B. Changes in the Planning Landscape

There have been changes in the carbon regulatory landscape since the Commission's last update. These changes are summarized below. The Company concludes that, given uncertainty in federal regulation of CO_2, it is reasonable to retain the current range of CO_2 cost values with an update to the upper range for consistency with existing carbon markets, and retain the 2025 year of application at this time.

1. Future EPA Power Sector Rulemaking

In June, the Supreme Court ruled in West Virginia vs. EPA (a case related to the repeal of the Clean Power Plan and the Affordable Clean Energy (ACE) rule proposals) that the EPA cannot use "generation shifting" as a Best System of

[2] *2020-2034 Upper Midwest Integrated Resource Plan*. Docket No. E002/RP-19-368. See Appendix F2, Strategist Modeling Assumptions and Inputs.
[3] We note that, as an investor-owned utility with customers located in North Dakota, we are also subject to new North Dakota Integrated Resource Plan requirements and there, consideration of potential future carbon regulation is expressly prohibited by North Dakota law (N.D.C.C. § 49-02-23).

Emission Reduction (BSER) under Section 111 (d) of the Clean Air Act. The court noted that the market-based cap and trade program established under the Clean Air Mercury Rule may not suffer from the generation-shifting problem, because the cap was based on the application of technology that was achievable at plants within the source category.

EPA is planning to release a new rule under Section 111 (b) for natural gas and coal generation in 2023, and the timing for a subsequent Section 111 (d) rule is still unknown. The Company is not able to anticipate how the rules will be structured and what the resulting regulatory cost may be at this time. However, it is possible the rules could allow for emissions trading as it was not precluded as a compliance mechanism by the Supreme Court's June 2022 decision. Emissions trading could result in an effective regulatory cost of carbon emissions.

Due to the uncertainty in the parameters of the Section 111 (b) and (d) rules that will be proposed, the Company does not propose that the Commission base its $/ton CO_2 regulatory cost range on past costs that were estimated in previous 111 (d) rulemakings.

2. Federal Legislation

No federal framework regulating carbon emissions from the electric sector has passed, or even gained significant traction, since the Commission's last update. The recently signed Inflation Reduction Act provides significant tax incentives for clean energy generation and infrastructure – which will certainly spur additional clean energy additions – but does not create any regulatory mechanisms for carbon pricing. Presently, there is no concrete federal legislative framework on which to base CO_2 regulatory costs.

3. State Legislation

Presently, there is no concrete State of Minnesota legislative or regulatory framework on which to base an update to the CO_2 regulatory costs range.

4. Update to RGGI and WCI Carbon Prices

The WCI and RGGI carbon markets have continued to operate since the Commission's last update. Since CO_2 allowance prices in these markets were a factor considered in the last update,[4] we provide an updated summary of the CO_2 allowance auction clearing prices in those markets over the last two years. There has been a

[4] ORDER ESTABLISHING 2020 AND 2021 ESTIMATE OF FUTURE CARBON DIOXIDE REGULATION COSTS. *In the Matter of Establishing an Updated Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minn. Stat. § 216H.06*. September 30, 2020. Docket Nos. E-999/DI-17-53 and Docket No. E-999/CI-07-1199.

slight increase in the upper bound of the price range since the last update.[5,6]

Table 1: CO_2 Allowance Auction Clearing Prices Summary – WCI and RGGI

			Clearing Price	
Market	Auction No.	Date of Auction	$/metric tonne	$/short ton
WCI	31	May-22	$30.85	$27.99
	30	Feb-22	$29.15	$26.45
	29	Nov-21	$28.26	$25.64
	28	Aug-21	$23.30	$21.14
	27	May-21	$18.80	$17.06
	26	Feb-21	$17.80	$16.15
	25	Nov-20	$16.93	$15.36
	24	Aug-20	$16.68	$15.14
	23	May-20	$16.68	$15.14
RGGI	56	Jun-22		$13.90
	55	Mar-22		$13.50
	54	Dec-21		$13.00
	53	Sep-21		$9.30
	52	Jun-21		$7.97
	51	Mar-21		$7.60
	50	Dec-20		$7.41
	49	Sep-20		$6.82

B. Questions Posed by the Agencies

The Agencies request comment on four specific topics, to which we respond below.

1. *Whether the currently established range of regulatory costs of CO_2 emissions of $5 to $25 per short ton remains reasonable, and if not, what range should be established and why.*

[5] WCI market CO_2 allowance auction results are posted on the California Air Resources Board website at https://ww3.arb.ca.gov/cc/capandtrade/auction/auction.htm. The *Summary of Auction Settlement Prices and Results* shows results from all auctions to date. See the "Current Auction Settlement Price" column, which gives the clearing price in that auction for current-vintage allowances. The market operates in metric tonnes, so we have provided the equivalent $/short ton.

[6] RGGI market CO_2 allowance auction results are posted on the RGGI website at https://www.rggi.org/auctions/auction-results/prices-volumes under "Allowance Prices and Volumes." The RGGI market operates in short tons.

The Company believes it would be reasonable to retain the basis for the current CO_2 regulatory costs range of $5 to $25 per short ton but that the upper bound should be raised to $30 per short ton to maintain consistency with allowance auction clearing prices in WCI. At the time of the last update, prices of $25 or higher had not yet occurred in either market; however, now WCI has seen prices at or above $25 for the last three quarterly auctions.

No federal legislative framework regulating CO_2 emissions from electricity has been enacted or gained sufficient traction to serve as a basis for estimating CO_2 regulatory costs. While there is clearly interest in Minnesota in reducing carbon emissions from all sectors of the economy, no state legislative framework regulating CO_2 emissions from electricity has yet been enacted to serve as a basis for estimating CO_2 regulatory costs.

Thus, as at the time of the last update, CO_2 allowance prices in WCI and RGGI remain the best estimate for the regulatory cost of carbon. While WCI has recently seen prices greater than $25 per short ton, neither market has seen allowance prices as high as $30 per short ton. However, as with the last update, we cannot rule out the possibility that Minnesota might take a regulatory approach that imposes a higher cost than the CO_2 allowance prices in WCI and RGGI.

2. *Whether 2025 is the appropriate threshold year for the application of the value range.*

The threshold year of application is intended to reflect the timeframe when the Commission believes utilities and their customers may begin incurring a CO_2 regulatory compliance cost, which could be under federal and/or state regulation.

The timeline for EPA's Clean Air Act 111 (b) and (d) rule enactment is uncertain. Minnesota may implement some form of state-level carbon regulation, but the compliance timeframe is currently speculative. Because of uncertainty in the development of state and federal carbon regulation, the Company believes it would be reasonable to retain the current threshold year. If new approaches to federal or state level carbon regulation are enacted and require compliance sooner or later than 2025, the Commission could reopen this docket.

3. *Whether the application scenarios listed in the Commission's September 30, 2020 Order remain reasonable and appropriate.*

The Company believes the five application scenarios required in the Commission's September 30, 2020 Order remain reasonable. The Company has applied these scenarios in the 2020-2034 Integrated Resource Plan, where high CO_2 environmental costs through 2024 and high CO_2 regulatory costs thereafter (scenario D) were used

as the reference assumption and we ran the remaining scenarios as sensitivities. As noted above, the Company also includes an assessment of scenario costs without CO_2 regulatory costs. A scenario without CO_2 provides additional information for consideration in resource planning and acquisition proceedings and allows the Company to comply with North Dakota requirements.

4. *Whether the Commission's update should apply to electricity generation resource planning and acquisition proceedings initiated in 2023 only, or in both 2023 and 2024.*

The Company believes it would be reasonable to apply the current update to electricity generation resource planning and acquisition proceedings initiated in both 2023 and 2024. In the event the federal or state CO_2 regulatory landscape shifts more quickly than expected, making either the $5 to $30 cost range or 2025 application year no longer appear reasonable, the Commission would have discretion to reopen the docket sooner than 2025.

The Company appreciates the opportunity to provide these comments. This document has been filed with the Minnesota Public Utilities Commission and copied parties on the attached service list. Please contact Sydnie Lieb at (612) 321-3051 or Sydnie.M.Lieb@xcelenergy.com, or me at (612) 330-6064 or Bria.E.Shea@xcelenergy.com, if you have any questions.

Sincerely,

/s/

BRIA E. SHEA
RVP, REGULATORY POLICY
NSPM REGULATORY AFFAIRS

Enclosures

c: Service List

CERTIFICATE OF SERVICE

I, Crystal Syvertsen, hereby certify that I have this day served copies of the foregoing document on the attached lists of persons.

xx by depositing a true and correct copy thereof, properly enveloped with postage paid in the United States mail at Minneapolis, Minnesota

xx electronic filing

Docket No.

Dated this 31st day of August 2022

/s/

_____

Crystal Syvertsen Regulatory Administrator

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First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Edward	Garvey	garveyed@aol.com	Residence	32 Lawton St Saint Paul, MN 55102	Electronic Service	No	OFF_SL_7-1199_1
Bruce	Gerhardson	bgerhardson@otpco.com	Otter Tail Power Company	PO Box 496 215 S Cascade St Fergus Falls, MN 565380496	Electronic Service	No	OFF_SL_7-1199_1
Todd J.	Guerrero	todd.guerrero@kutakrock.com	Kutak Rock LLP	Suite 1750 220 South Sixth Street Minneapolis, MN 554021425	Electronic Service	No	OFF_SL_7-1199_1
Joe	Hoffman	ja.hoffman@smmpa.org	SMMPA	500 First Ave SW Rochester, MN 55902-3303	Electronic Service	No	OFF_SL_7-1199_1
Casey	Jacobson	cjacobson@bepc.com	Basin Electric Power Cooperative	1717 East Interstate Avenue Bismarck, ND 58501	Electronic Service	No	OFF_SL_7-1199_1
Craig	McDonnell	Craig.McDonnell@state.mn.us	MN Pollution Control Agency	520 Lafayette Road St. Paul, MN 55101	Electronic Service	No	OFF_SL_7-1199_1
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	OFF_SL_7-1199_1
Dalene	Monsebroten	dalene.monsebroten@nmpagency.com	Northern Municipal Power Agency	123 2nd St W Thief River Falls, MN 56701	Electronic Service	No	OFF_SL_7-1199_1
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_7-1199_1
Peter	Nelson	peter.nelson@americanexperiment.org	Center of the American Experiment	8441 Wayzata Boulevard Suite 350 Golden Valley, MN 55426	Electronic Service	No	OFF_SL_7-1199_1

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
David	Niles	david.niles@avantenergy.com	Minnesota Municipal Power Agency	220 South Sixth Street Suite 1300 Minneapolis, Minnesota 55402	Electronic Service	No	OFF_SL_7-1199_1
Samantha	Norris	samanthanorris@alliantenergy.com	Interstate Power and Light Company	200 1st Street SE PO Box 351 Cedar Rapids, IA 524060351	Electronic Service	No	OFF_SL_7-1199_1
Russell	Olson	rolson@hcpd.com	Heartland Consumers Power District	PO Box 248 Madison, SD 570420248	Electronic Service	No	OFF_SL_7-1199_1
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	Yes	OFF_SL_7-1199_1
Kevin	Reuther	kreuther@mncenter.org	MN Center for Environmental Advocacy	26 E Exchange St, Ste 206 St. Paul, MN 551011667	Electronic Service	No	OFF_SL_7-1199_1
Robert K.	Sahr	bsahr@eastriver.coop	East River Electric Power Cooperative	P.O. Box 227 Madison, SD 57042	Electronic Service	No	OFF_SL_7-1199_1
Kay	Schraeder	kschraeder@minnkota.com	Minnkota Power	5301 32nd Ave S Grand Forks, ND 58201	Electronic Service	No	OFF_SL_7-1199_1
Christine	Schwartz	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	No	OFF_SL_7-1199_1
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul, MN 55101	Electronic Service	No	OFF_SL_7-1199_1
Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	OFF_SL_7-1199_1

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Elizabeth	Wefel	eawefel@flaherty-hood.com	Flaherty & Hood, P.A.	525 Park St Ste 470 Saint Paul, MN 55103	Electronic Service	No	OFF_SL_7-1199_1
Robyn	Woeste	robynwoeste@alliantenergy.com	Interstate Power and Light Company	200 First St SE Cedar Rapids, IA 52401	Electronic Service	No	OFF_SL_7-1199_1

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	No	OFF_SL_19-406_19-406
Brian	Draxten	bhdraxten@otpco.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380498	Electronic Service	No	OFF_SL_19-406_19-406
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280 Saint Paul, MN 551012198	Electronic Service	No	OFF_SL_19-406_19-406
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_19-406_19-406
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	No	OFF_SL_19-406_19-406
Christine	Schwartz	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	No	OFF_SL_19-406_19-406
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul, MN 55101	Electronic Service	No	OFF_SL_19-406_19-406
Bria	Shea	bria.e.shea@xcelenergy.com	Xcel Energy	414 Nicollet Mall Minneapolis, MN 55401	Electronic Service	No	OFF_SL_19-406_19-406
Analeisha	Vang	avang@mnpower.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	OFF_SL_19-406_19-406

CERTIFICATE OF SERVICE

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

Minnesota Department of Commerce
Comments

Docket No. E999/CI-07-1199 and E999/DI-22-236

Dated this **5th** day of **January 2023**

/s/Sharon Ferguson

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Jon	Brekke	jbrekke@grenergy.com	Great River Energy	12300 Elm Creek Boulevard Maple Grove, MN 553694718	Electronic Service	No	OFF_SL_7-1199_Official
Christina	Brusven	cbrusven@fredlaw.com	Fredrikson Byron	200 S 6th St Ste 4000 Minneapolis, MN 554021425	Electronic Service	No	OFF_SL_7-1199_Official
Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	No	OFF_SL_7-1199_Official
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David	Dahlberg	davedahlberg@nweco.com	Northwestern Wisconsin Electric Company	P.O. Box 9 104 South Pine Street Grantsburg, WI 548400009	Electronic Service	No	OFF_SL_7-1199_Official
Curt	Dieren	curt.dieren@dgr.com	L&O Power Cooperative	1302 S Union St Rock Rapids, IA 51246	Electronic Service	No	OFF_SL_7-1199_Official
Brian	Draxten	bhdraxten@otpco.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380498	Electronic Service	No	OFF_SL_7-1199_Official
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280 Saint Paul, MN 551012198	Electronic Service	Yes	OFF_SL_7-1199_Official
Edward	Garvey	garveyed@aol.com	Residence	32 Lawton St Saint Paul, MN 55102	Electronic Service	No	OFF_SL_7-1199_Official

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Bruce	Gerhardson	bgerhardson@otpco.com	Otter Tail Power Company	PO Box 496 215 S Cascade St Fergus Falls, MN 565380496	Electronic Service	No	OFF_SL_7-1199_Official
Todd J.	Guerrero	todd.guerrero@kutakrock.com	Kutak Rock LLP	Suite 1750 220 South Sixth Street Minneapolis, MN 554021425	Electronic Service	No	OFF_SL_7-1199_Official
Joe	Hoffman	ja.hoffman@smmpa.org	SMMPA	500 First Ave SW Rochester, MN 55902-3303	Electronic Service	No	OFF_SL_7-1199_Official
Casey	Jacobson	cjacobson@bepc.com	Basin Electric Power Cooperative	1717 East Interstate Avenue Bismarck, ND 58501	Electronic Service	No	OFF_SL_7-1199_Official
Craig	McDonnell	Craig.McDonnell@state.mn.us	MN Pollution Control Agency	520 Lafayette Road St. Paul, MN 55101	Electronic Service	No	OFF_SL_7-1199_Official
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	OFF_SL_7-1199_Official
Dalene	Monsebroten	dalene.monsebroten@nmpagency.com	Northern Municipal Power Agency	123 2nd St W Thief River Falls, MN 56701	Electronic Service	No	OFF_SL_7-1199_Official
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_7-1199_Official
Peter	Nelson	peter.nelson@americanexperiment.org	Center of the American Experiment	8441 Wayzata Boulevard Suite 350 Golden Valley, MN 55426	Electronic Service	No	OFF_SL_7-1199_Official
David	Niles	david.niles@avantenergy.com	Minnesota Municipal Power Agency	220 South Sixth Street Suite 1300 Minneapolis, Minnesota 55402	Electronic Service	No	OFF_SL_7-1199_Official

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Samantha	Norris	samanthanorris@alliantenergy.com	Interstate Power and Light Company	200 1st Street SE PO Box 351 Cedar Rapids, IA 524060351	Electronic Service	No	OFF_SL_7-1199_Official
Russell	Olson	rolson@hcpd.com	Heartland Consumers Power District	PO Box 248 Madison, SD 570420248	Electronic Service	No	OFF_SL_7-1199_Official
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	Yes	OFF_SL_7-1199_Official
Kevin	Reuther	kreuther@mncenter.org	MN Center for Environmental Advocacy	26 E Exchange St, Ste 206 St. Paul, MN 551011667	Electronic Service	No	OFF_SL_7-1199_Official
Robert K.	Sahr	bsahr@eastriver.coop	East River Electric Power Cooperative	P.O. Box 227 Madison, SD 57042	Electronic Service	No	OFF_SL_7-1199_Official
Kay	Schraeder	kschraeder@minnkota.com	Minnkota Power	5301 32nd Ave S Grand Forks, ND 58201	Electronic Service	No	OFF_SL_7-1199_Official
Christine	Schwartz	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	No	OFF_SL_7-1199_Official
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul, MN 55101	Electronic Service	No	OFF_SL_7-1199_Official
Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	OFF_SL_7-1199_Official
Pat	Treseler	pat.jcplaw@comcast.net	Paulson Law Office LTD	4445 W 77th Street Suite 224 Edina, MN 55435	Electronic Service	No	OFF_SL_7-1199_Official

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Karen	Tyler	ktyler@nd.gov	Industrial Commission of North Dakota	14th Floor 600 E. Boulevard Avenue, Dept. 405 Bismarck, ND 58505	Electronic Service	No	OFF_SL_7-1199_Official
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Robyn	Woeste	robynwoeste@alliantenergy.com	Interstate Power and Light Company	200 First St SE Cedar Rapids, IA 52401	Electronic Service	No	OFF_SL_7-1199_Official

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Jon	Brekke	jbrekke@grenergy.com	Great River Energy	12300 Elm Creek Boulevard Maple Grove, MN 553694718	Electronic Service	No	OFF_SL_22-236_DI-22-236
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Generic Notice	Commerce Attorneys	commerce.attorneys@ag.state.mn.us	Office of the Attorney General-DOC	445 Minnesota Street Suite 1400 St. Paul, MN 55101	Electronic Service	Yes	OFF_SL_22-236_DI-22-236
Riley	Conlin	riley.conlin@stoel.com	Stoel Rives LLP	33 S. 6th Street Suite 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_22-236_DI-22-236
Stacy	Dahl	sdahl@minnkota.com	Minnkota Power Cooperative, Inc.	5301 32nd Ave S Grand Forks, ND 58201	Electronic Service	No	OFF_SL_22-236_DI-22-236
David	Dahlberg	davedahlberg@nweco.com	Northwestern Wisconsin Electric Company	P.O. Box 9 104 South Pine Street Grantsburg, WI 548400009	Electronic Service	No	OFF_SL_22-236_DI-22-236
Curt	Dieren	curt.dieren@dgr.com	L&O Power Cooperative	1302 S Union St Rock Rapids, IA 51246	Electronic Service	No	OFF_SL_22-236_DI-22-236
Brian	Draxten	bhdraxten@otpco.com	Otter Tail Power Company	P.O. Box 496 215 South Cascade Street Fergus Falls, MN 565380498	Electronic Service	No	OFF_SL_22-236_DI-22-236
Sharon	Ferguson	sharon.ferguson@state.mn.us	Department of Commerce	85 7th Place E Ste 280 Saint Paul, MN 551012198	Electronic Service	No	OFF_SL_22-236_DI-22-236
Barb	Freese	bfreese@mncenter.org	Minnesota Center for Environmental Advocacy	1919 University Ave W Ste 515 Saint Paul, MN 55104-3435	Electronic Service	No	OFF_SL_22-236_DI-22-236

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
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Joe	Hoffman	ja.hoffman@smmpa.org	SMMPA	500 First Ave SW Rochester, MN 55902-3303	Electronic Service	No	OFF_SL_22-236_DI-22-236
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Craig	McDonnell	Craig.McDonnell@state.mn.us	MN Pollution Control Agency	520 Lafayette Road St. Paul, MN 55101	Electronic Service	No	OFF_SL_22-236_DI-22-236
David	Moeller	dmoeller@allete.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	OFF_SL_22-236_DI-22-236

First Name	Last Name	Email	Company Name	Address	Delivery Method	View Trade Secret	Service List Name
Dalene	Monsebroten	dalene.monsebroten@nmpagency.com	Northern Municipal Power Agency	123 2nd St W Thief River Falls, MN 56701	Electronic Service	No	OFF_SL_22-236_DI-22-236
Andrew	Moratzka	andrew.moratzka@stoel.com	Stoel Rives LLP	33 South Sixth St Ste 4200 Minneapolis, MN 55402	Electronic Service	No	OFF_SL_22-236_DI-22-236
Pouya	Najmaie	pouya@cooperativeenergyfutures.com	Cooperative Energy Futures	3416 16th Ave S Minneapolis, MN 55407	Electronic Service	No	OFF_SL_22-236_DI-22-236
Peter	Nelson	peter.nelson@americanexperiment.org	Center of the American Experiment	8441 Wayzata Boulevard Suite 350 Golden Valley, MN 55426	Electronic Service	No	OFF_SL_22-236_DI-22-236
David	Niles	david.niles@avantenergy.com	Minnesota Municipal Power Agency	220 South Sixth Street Suite 1300 Minneapolis, Minnesota 55402	Electronic Service	No	OFF_SL_22-236_DI-22-236
Samantha	Norris	samanthanorris@alliantenergy.com	Interstate Power and Light Company	200 1st Street SE PO Box 351 Cedar Rapids, IA 524060351	Electronic Service	No	OFF_SL_22-236_DI-22-236
Russell	Olson	rolson@hcpd.com	Heartland Consumers Power District	PO Box 248 Madison, SD 570420248	Electronic Service	No	OFF_SL_22-236_DI-22-236
Audrey	Partridge	apartridge@mncee.org	Center for Energy and Environment	212 3rd Ave. N. Suite 560 Minneapolis, Minnesota 55401	Electronic Service	No	OFF_SL_22-236_DI-22-236
Kristel	Porter	kristel@mnrenewablenow.org	MN Renewable Now	N/A	Electronic Service	No	OFF_SL_22-236_DI-22-236
Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us	Office of the Attorney General-RUD	1400 BRM Tower 445 Minnesota St St. Paul, MN 551012131	Electronic Service	Yes	OFF_SL_22-236_DI-22-236

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Kevin	Reuther	kreuther@mncenter.org	MN Center for Environmental Advocacy	26 E Exchange St, Ste 206 St. Paul, MN 551011667	Electronic Service	No	OFF_SL_22-236_DI-22-236
Zachary	Ruzycki	zruzycki@grenergy.com	Great River Energy	12300 Elm Creek Boulevard Maple Grove, Minnesota 55369	Electronic Service	No	OFF_SL_22-236_DI-22-236
Robert K.	Sahr	bsahr@eastriver.coop	East River Electric Power Cooperative	P.O. Box 227 Madison, SD 57042	Electronic Service	No	OFF_SL_22-236_DI-22-236
Kay	Schraeder	kschraeder@minnkota.com	Minnkota Power	5301 32nd Ave S Grand Forks, ND 58201	Electronic Service	No	OFF_SL_22-236_DI-22-236
Christine	Schwartz	Regulatory.records@xcelenergy.com	Xcel Energy	414 Nicollet Mall FL 7 Minneapolis, MN 554011993	Electronic Service	No	OFF_SL_22-236_DI-22-236
Will	Seuffert	Will.Seuffert@state.mn.us	Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul, MN 55101	Electronic Service	Yes	OFF_SL_22-236_DI-22-236
Eric	Swanson	eswanson@winthrop.com	Winthrop & Weinstine	225 S 6th St Ste 3500 Capella Tower Minneapolis, MN 554024629	Electronic Service	No	OFF_SL_22-236_DI-22-236
Pat	Treseler	pat.jcplaw@comcast.net	Paulson Law Office LTD	4445 W 77th Street Suite 224 Edina, MN 55435	Electronic Service	No	OFF_SL_22-236_DI-22-236
Karen	Tyler	ktyler@nd.gov	Industrial Commission of North Dakota	14th Floor 600 E. Boulevard Avenue, Dept. 405 Bismarck, ND 58505	Electronic Service	No	OFF_SL_22-236_DI-22-236

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Analeisha	Vang	avang@mnpower.com	Minnesota Power	30 W Superior St Duluth, MN 558022093	Electronic Service	No	OFF_SL_22-236_DI-22-236
Elizabeth	Wefel	eawefel@flaherty-hood.com	Flaherty & Hood, P.A.	525 Park St Ste 470 Saint Paul, MN 55103	Electronic Service	No	OFF_SL_22-236_DI-22-236
Robyn	Woeste	robynwoeste@alliantenergy.com	Interstate Power and Light Company	200 First St SE Cedar Rapids, IA 52401	Electronic Service	No	OFF_SL_22-236_DI-22-236