414 Nicollet Mall, 5th Floor
Minneapolis, Minnesota 55401

May 16, 2016

--VIA ELECTRONIC FILING--

Mr. Daniel P Wolf
Executive Secretary
Minnesota Public Utilities Commission
350 Metro Square Building
121 7th Place East
St. Paul, MN 55101

RE: *IN THE MATTER OF THE FURTHER INVESTIGATION INTO ENVIRONMENTAL AND SOCIOECONOMIC COSTS UNDER MINN. STAT. §216B.2422, SUBD. 3*
REPLY EXCEPTIONS TO ALJ'S FINDINGS OF FACT, CONCLUSIONS AND RECOMMENDATIONS
MPUC DOCKET NO. E999/CI-14-643
OAH DOCKET NO. 80-2500-31888

Dear Mr. Wolf:

Northern States Power Company, doing business as Xcel Energy, submits the enclosed Reply Exceptions to the Administrative Law Judge's *Findings of Fact, Conclusions and Recommendations* issued April 15, 2016 related to the CO_2 portion of the above-referenced proceeding.

If you have questions or need additional information, please contact me at (612) 215-4656 or at james.r.denniston@xcelenergy.com .

Sincerely,

/s/

JAMES R. DENNISTON
ASSISTANT GENERAL COUNSEL

Enclosures
c: Service List

STATE OF MINNESOTA
BEFORE THE OFFICE OF ADMINISTRATIVE HEARINGS
FOR THE
MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of the Further Investigation into Environmental and Socioeconomic Costs Under Minnesota Statute 216B.2422, Subdivision 3	OAH Docket No. 80-2500-31888 MPUC Docket No. E-999/CI-14-643

XCEL ENERGY REPLY TO EXCEPTIONS TO ALJ'S FINDINGS OF FACT, CONCLUSIONS AND RECOMMENDATIONS REGARDING CO_2

May 16, 2016

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TABLE OF CONTENTS

I. INTRODUCTION

Northern States Power Company, doing business as Xcel Energy, respectfully submits this Reply to the Exceptions filed by other Parties to the Administrative Law Judge's *Findings of Fact, Conclusions, and Recommendations: Carbon Dioxide Values* (the ALJ CO_2 Report) in this proceeding. We continue to support our May 5, 2016 Exceptions and provide the following brief summary of our central points.

In Exceptions filed on May 5, Xcel Energy made clear why we do not support the ALJ's recommendation to adopt the Federal Social Cost of Carbon (FSCC) executive summary values – i.e., the average values at 2.5, 3, and 5 percent discount rates – as the Commission's updated environmental cost of CO_2, even with her proposed adjustments to those values. We explained that the executive summary values are falsely precise point estimates, which were not designed to represent and do not function as a range, as required by statute. Adopting three point estimates does not appropriately characterize the uncertainty in estimating climate damages. We noted that the Interagency Working Group (IWG) methodology incompletely captures both high damages (due to omitted impacts and incomplete characterization of "tipping point" impacts) and low damages (due to incomplete characterization of governmental mitigation, societal adaptation and endogenous technological change), and proponents of the FSCC failed to demonstrate that uncertainty on either side is necessarily greater. In contrast, Xcel Energy's proposal represents a true range, statistically derived in a manner that recognizes the uncertainties on both sides.[1] A recent assessment of the FSCC by the National Academy of Sciences affirms our approach, as explained later in this Reply.

[1] Xcel Energy Exceptions to the Administrative Law Judge's *Findings of Fact, Conclusions and Recommendations Regarding CO_2* (hereafter "Xcel Energy Exceptions"), at 18-22.

We highlighted that under the ALJ's Burden of Proof Order,[2] proponents of the FSCC bear the burden to demonstrate that the FSCC is reasonable and best available; part of this burden is demonstrating that the FSCC, which was designed for federal regulatory impact analysis, is reasonable for use under Minn. Stat. §216B.2422, subd. 3. This burden is not met by merely showing that the IWG has not specifically recommended against using the FSCC for Minn. Stat. §216B.2422 – a question the IWG has never been asked – or speculating that the IWG might have done nothing differently if asked to develop a range for Minn. Stat. §216B.2422. The IWG in fact explicitly stated that it has not recommended use of the FSCC for state level decision making.[3] Thus, proponents of the FSCC executive summary values in this respect failed to meet their burden of proof.[4]

In contrast, Xcel Energy's proposal is designed with the intended application in mind. We based our range on the same basic science and policy judgments as the IWG, but we balanced eight standard of review criteria that we proposed in pre-filed testimony to evaluate the diverse proposals by different Parties and help in deciding which is reasonable and the best available for determining the environmental cost of CO_2 under Minn. Stat. §216B.2422. We put particular emphasis on deriving a range that balances uncertainty, risk tolerance, and practicability. This balance – including considering practicability when the CO_2 environmental cost values are *applied* in resource planning and acquisition – is essential to ensure this proceeding is not merely an abstract academic exercise but provides useful information for Commission decisions. We explained why in our view it is appropriate and necessary for the

[2] ALJ's March 27, 2015 Order, cited in ALJ CO_2 Report at 5.
[3] Ex. 101 (Polasky Rebuttal), Schedule 1 containing the IWG's July 2015 *Response to Comments: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, at 40-41.
[4] Xcel Energy Exceptions at 23-25.

Commission to exercise its discretion to consider the practical implications of adopting the FSCC.[5]

We continue to advocate adoption of Xcel Energy's proposed CO_2 environmental cost range. However, if the Commission accepts the ALJ's recommendation to adopt the FSCC executive summary values, we urge the Commission to apply her recommended adjustments – shortening the modeling horizon to the year 2200 and excluding the 95th percentile value.[6] While we do not believe these adjustments make the FSCC a reasonable and best available measure for use under Minn. Stat. §216B.2422, they do reduce the embedded uncertainty and improve practicability. Adopting the 95th percentile would only be defensible if the corresponding 5th percentile is also adopted, but the resulting range would be so broad as to point to opposite resource plans.

Lastly, we consider the quantification of emission leakage to be outside the scope of this case. We also advised against opening a separate generalized proceeding on emission leakage. We believe a proceeding attempting to generalize a method applicable to a wide variety of specific Commission decisions that will emerge in future dockets would be difficult, speculative and not likely produce a practicable result.[7]

In this Reply, we focus on three issues raised by the Minnesota Department of Commerce – Division of Energy Resources and Minnesota Pollution Control Agency (Agencies) and the Clean Energy Organizations (CEO) in their Exceptions: modeling horizon, the 95th percentile FSCC value, and future updates to the CO_2 environmental cost values.

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[5] Xcel Energy Exceptions at 5-10.
[6] ALJ CO_2 Report, Recommendation 1 at 124; Xcel Energy Exceptions, Attachment A, at 4.
[7] Xcel Energy Exceptions at 26-27.

II. MODELING HORIZON

The ALJ recommends that the Commission "adopt the Federal Social Cost of Carbon as reasonable and the best available measure to determine the environmental cost of CO_2, establishing a range of values including the 2.5 percent, 3.0 percent, and 5 percent discount rates," but adds that "the FSCC values will be re-calculated to reflect a shortened time horizon extending to the year 2200."[8] Both the Agencies and CEO oppose this adjustment, arguing that no Party proposed shortening the modeling horizon specifically to the year 2200, or offered evidence to support 2200.[9] They contend that shortening the modeling horizon would be impractical because it would require re-running the Integrated Assessment Models (IAMs), now and each time the IWG updates the FSCC.[10] In addition, the Agencies argue that uncertainty is not a valid reason to truncate the modeling horizon because uncertainty is not significantly greater after 2200 than after 2100. The Agencies also contend that societal/technological adaptation is not the major area of uncertainty in the FSCC estimates.[11]

Xcel Energy disagrees with several of these claims, but we begin by noting that we did not shorten the modeling horizon in our proposed range. This range is based on damages to the year 2300, since it is derived from the IWG's raw modeling results – 150,000 FSCC estimates per emission year and discount rate – and each of these data points represents an estimate of the net present value of the difference in damages between a CO_2 "pulse case" and the modeled reference case, from the emission year through the year 2300.

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[8] ALJ CO_2 Report, Recommendation 1.a) at 124.

[9] *Exceptions of the Minnesota Department of Commerce, Division of Energy Resources and the Minnesota Pollution Control Agency* (hereafter "Agencies Exceptions") at 8; *Exceptions to Findings of Fact, Conclusions and Recommendations: Carbon Dioxide Values of Clean Energy Organizations* (hereafter "CEO Exceptions") at 6-7, 10.

[10] Agencies Exceptions at 9; CEO Exceptions at 12-13.

[11] Agencies Exceptions at 3-4, 6-7.

We acknowledged, when other Parties proposed a shorter modeling horizon, that the degree of uncertainty and speculation embedded in the IWG's estimates is greater, both further out in time and for greater temperature changes.[12] This is for two reasons. First, further out in time, the IWG methodology's incomplete modeling of mitigation and adaptation and failure to model endogenous technological change means that it may not capture efforts by far-distant generations to reduce emissions, resulting in the possibility that emissions and therefore damages are overestimated. The IWG methodology fixes all five EMF-22 emission trajectories up front and does not allow them to change in response to damages. Moreover, four of those emission trajectories – the basis for 80 percent of all FSCC estimates – are "business as usual" scenarios assuming no global coordination on CO_2 mitigation, which is inconsistent with current evidence.[13] Second, uncertainty is greater for the large temperature changes that the IAMs predict further out in time, because the empirical data used to validate the IAM damage functions naturally derives only from temperature changes experienced to date – i.e., relatively small temperature changes – and there is uncertainty whether the IAM damage functions validated based on small temperature changes remain robust for the larger temperature changes predicted later in the modeling timeframe.[14]

While acknowledging these uncertainties, Xcel Energy did not find it feasible to adjust our proposal to a shorter modeling horizon, since this would have required acquiring, re-coding, and re-running the IAMs.[15] Instead, we addressed the inherent uncertainty in a different way by using symmetric percentiles – the 25th and 75th percentiles of the full data distribution at each discount rate – to eliminate the most uncertain and improbable estimates at the lower end (below the 25th percentile) and at

[12] Ex. 601 (Martin Rebuttal) at 43-45.
[13] Ex. 600 (Martin Direct) at 34; Ex. 601 (Martin Rebuttal) at 47-49; Xcel Energy Exceptions at 19-23.
[14] Ex. 600 (Martin Direct) at 47-48.
[15] Ex. 601 (Martin Rebuttal) at 45.

the higher end (above the 75th percentile). We believe this approach reasonably addresses the uncertainty of a longer modeling horizon and makes Xcel Energy's proposal a reasonable and best available CO_2 environmental cost range for Commission adoption. However, uncertainty is not sufficiently addressed in the FSCC executive summary point estimates. Therefore, if the Commission rejects our proposal and adopts the FSCC executive summary values, we would support the ALJ's recommendation 1.a) to recalculate those values to reflect a modeling horizon to 2200. We believe it is necessary to address the uncertainty in the FSCC executive summary values, and shortening the modeling horizon to 2200 would at least reduce that uncertainty if the Commission adopts these values (which we do not recommend).

The Agencies and CEO are correct that no Party specifically proposed the year 2200, but Parties to this proceeding did present rationale, as well as methods, for shortening the modeling horizon to 2100 or 2140. Those methods could equally be used for 2200.[16]

Finally, we disagree with the Agencies' assertion that societal/technological adaptation is not a major area of uncertainty in the FSCC estimates. It is one of many sources of uncertainty, some causing the IWG methodology to overestimate damages and others causing it to underestimate. No Party has demonstrated by a preponderance of the evidence which of these uncertainties is greater – a key argument for treating them symmetrically, as Xcel Energy has done.

III. 95TH PERCENTILE VALUE

Although the ALJ recommends that the Commission adopt the FSCC executive summary values, she recommends excluding one of those values, the 95th

[16] Ex. 300 (Smith Direct) at 22-23, 31-33; Smith Expert Report at 79, 110.

percentile at 3 percent discount rate.[17] The Agencies did not oppose this recommendation. The CEO are the only Party in this proceeding who recommend adopting the 95th percentile value, asserting that evidence in the record shows that the FSCC is artificially low and incompletely accounts for the possibility of catastrophic damages.[18]

Xcel Energy agrees with the ALJ that it would be inappropriate to adopt the 95th percentile value at 3 percent discount rate, for several reasons. First, it would be inappropriate because the 95th percentile – like all the executive summary values – represents a point estimate, raising issues of false precision that are of greater import in resource planning and acquisition than in federal regulatory impact analysis.[19]

Second, it would be inappropriate because the IWG presented this value for only one discount rate – 3 percent – despite acknowledging that no consensus exists about what discount rate to use in quantifying monetary damages for intergenerational environmental problems.[20] Adopting this value would suggest agreement, which has not been established in this proceeding, that 3 percent is the appropriate discount rate.

Third, adopting the 95th percentile without its corresponding 5th percentile would suggest a degree of confidence that the IWG methodology underestimates damages, which has not been established by a preponderance of the evidence in this proceeding. The CEO speculate that because the IWG omits some damages, and only partially characterizes catastrophic or "tipping point" damages, the FSCC is

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[17] ALJ CO_2 Report, Recommendation 1.b) at 124.
[18] CEO Exceptions at 16-18.
[19] Ex. 602 (Martin Surrebuttal) at 7-9.
[20] "The choice of a discount rate, especially over long periods of time, raises highly contested and exceedingly difficult questions of science, economics, philosophy, and law. Although it is well understood that the discount rate has a large influence on the current value of future damages, there is no consensus about what rates to use in this context." Ex. 600 (Martin Direct) at 44; Ex. 600, Schedule 6 (Interagency Working Group's February 2010 *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*) at 17.

"artificially low," and adopting the 95th percentile is a way to embed in the Commission's CO_2 environmental cost range a degree of caution that climate damages might be higher than estimated by the IWG.[21] In other words, the CEO are recommending adoption of the 95th percentile of the current distribution of FSCC values to represent damage estimates that, due to limitations in the methodology, are *not in the current distribution at all*. Such a decision is without statistical basis, but might still have a policy basis if we knew that the IWG methodology systematically underestimates damages because the damages it omits on the high side are greater than those it omits on the low side. However, we do not know this. The CEO have presented no evidence to establish whether the methodological omissions and flaws on the high-damage side (omitted damages, incomplete characterization of tipping point damages) or those on the low-damage side (incomplete modeling of mitigation, adaptation and endogenous technological change) are greater. Thus adopting the 95th percentile to capture the possibility that the IWG methodology underestimates damages, without adopting the corresponding 5th percentile to capture the possibility that it overestimates, would not be defensible considering the uncertainty and lack of evidence in the record.

A better approach under these circumstances is to treat uncertainty symmetrically. This was Xcel Energy's approach: we began by omitting from further consideration the relatively improbable damage estimates both below the 25th percentile and above the 75th percentile. This omitted low-probability estimates on both sides – and, by extension, damage estimates (both low and high) that are currently absent from the probability distribution because of the inability of the IWG's current methodology to capture them. We established our initial range from the 25th percentile at 5 percent discount rate to the 75th percentile at 2.5 percent

[21] CEO Exceptions at 16-18, 20-21.

discount rate, retaining three fourths of all the IWG's damage estimates. We acknowledged that any symmetrical pair of percentiles (1st and 99th, 5th and 95th, etc.) would have been *statistically* defensible, though not necessarily practicable. The wider the range between percentiles, the lower the implied risk tolerance – i.e., tolerance for the risk that the actual value of future damages lies outside the Commission's adopted range – but a balance must be struck, since wider ranges could also be impracticable as applied. If too far apart, the bookends of the Commission's range might merely point to opposite resource plans. For example, adopting the 95th percentile, which would require also adopting the 5th percentile, would mean adopting a range from $142.60 to $1.80 in nominal dollars per ton in emission year 2020. This would likely assign the lowest Present Value of Social Cost (PVSC) ranking to two diametrically opposed resource plans, which we argued does not provide useful information for decision-making.[22] So the choice of *which* pair of symmetrical percentiles to use balances risk tolerance with practicability, but what would not be statistically defensible is adopting only one side of any pair.

In arguing to adopt the 95th percentile value, the CEO assert that the ALJ rejected Xcel Energy's proposal on the grounds that it "unreasonably excluded information about the magnitude as well as the likelihood of significant damages as reflected in the higher end tails of the distribution."[23] As noted in our Exceptions, this conclusion is incorrect. Using the 25th and 75th percentiles as bookends of our initial range does not exclude information about the magnitude and likelihood of significant damages, because these bookends treat the high damage values in the same manner as the low damage values. We retained all predictions in the initial FSCC distribution – both high and low – and they affected where all percentiles landed in the distribution.

[22] Ex. 602 (Martin Surrebuttal) at 15.
[23] CEO Exceptions at 18.

If we had ignored the high end values, all percentiles would have landed at a lower damage value, and the bookend values of our range would have shifted to the left.[24]

A. National Academy of Sciences Assessment

Xcel Energy's use of percentiles and symmetrical approach to uncertainty finds support in a recent assessment of near-term improvements to the FSCC by the National Academy of Sciences (NAS). This assessment, while released in 2016 and thus not introduced as an exhibit in this proceeding, was cited by the CEO and by Minnesota Large Industrial Group in their Exceptions,[25] so we have evaluated whether there are additional findings relevant to this proceeding. NAS's charge was to consider possible improvements for a near-term update of the FSCC, including identifying ways the IWG could improve the characterization of uncertainty and the transparency of the FSCC. NAS notes that the FSCC depends on many uncertain inputs, and none of the three IAMs in NAS's view is sufficiently comprehensive to include all of the uncertainties that are likely to be important. NAS recommends that "factors omitted or not adequately captured by the analysis need to be better characterized" as the IWG updates the FSCC.[26]

NAS then specifically addresses how the uncertainty could be better conveyed in the IWG's reporting of results:

> "The only range of SCC estimates presented in the executive summary of the technical support documents is the range based on discount rates,

[24] Xcel Energy Exceptions at 16.
[25] CEO Exceptions at 13; Minnesota Large Industrial Group *Exceptions to the Findings of Fact, Conclusions, and Recommendations of the Administrative Law Judge Regarding Phase I (CO_2 Track)* at 7.
[26] National Academies of Sciences, Engineering, and Medicine. (2016). *Assessment of Approaches to Updating the Social Cost of Carbon: Phase 1 Report on a Near-Term Update*. Committee on Assessing Approaches to Updating the Social Cost of Carbon, Board on Environmental Change and Society. Washington, DC: The National Academies Press. doi: 10.17226/21898. (Hereafter "NAS Assessment of SCC") Available at http://www.nap.edu/catalog/21898/assessment-of-approaches-to-updating-the-social-cost-of-carbon. At 46-48.

> together with the 95th percentile of the SCC based on a 3 percent discount rate. A more complete characterization of uncertainty would include other sources of variability in the SCC, for each discount rate, *and would include both high and low values*. A balanced presentation of uncertainty includes both low and high values conditioned on each discount rate… To facilitate such inclusion, the executive summary of the technical support document *should present symmetric high and low values from the frequency distribution of SCC estimates with equal prominence, conditional on each assumed discount rate… the IWG could identify a high percentile (e.g., 90th, 95th) and corresponding low percentile (e.g., 10th, 5th) of the SCC frequency distributions on each graph*. This approach would define a usable uncertainty range for the regulatory impact analysis for each discount rate."[27]

NAS provides an explicit illustration, recommending an executive summary table with low, average and high estimates at each discount rate, and charts showing 10th and 90th percentiles. A footnote indicates that the 10th and 90th percentiles are provided only as an example; the NAS recommendation is that *symmetrical low and high percentiles* (not necessarily the 10th and 90th specifically) are needed to convey the uncertainty in the results.[28] Presenting only the 95th percentile, only for one discount rate, does not in NAS's view accurately convey the uncertainty involved.

Moreover, NAS is speaking in its assessment only to how best to characterize uncertainty and improve transparency when the FSCC is used for its intended purpose of federal regulatory impact analysis. If this change is important in that context, it is all the more important in resource planning and acquisition, where false precision has potentially more serious consequences.

B. Policy Arguments

The CEO contend that "eliminating [the 95th percentile value] from consideration is a policy decision that the Commission can choose to make in a given

[27] NAS Assessment of SCC at 48-49. Emphasis added.
[28] NAS Assessment of SCC at 50.

proceeding, but it is inappropriate to make that policy decision as part of this scientific investigation."[29] As we have noted, this proceeding is not a purely scientific investigation. Estimating CO_2 environmental cost values depends in part on climate science and modeling capabilities, but is at least as strongly driven by public policy judgments, including those raised by other Parties (geographic scope of damages, modeling horizon, choice of discount rates, and treatment of marginal emissions) and those raised by Xcel Energy (the appropriate balancing of uncertainty, risk tolerance and practicability when deciding what CO_2 environmental cost range is reasonable and best available). The IWG's methodology to develop the FSCC has many embedded policy decisions, and these types of decisions are unavoidable as the Commission updates its CO_2 environmental cost range. The Commission certainly has discretion to decide in this proceeding whether to adopt the 95th percentile value, since this is fundamentally a policy decision about how best to handle uncertainty, risk, and practicability. Indeed, it would be preferable for the Commission to provide clear and consistent policy direction in this proceeding rather than revisiting policy choices and making case-by-case judgments in future dockets.

The CEO also assert that retaining the 95th percentile value is necessary to "counter an undervaluation practice that Minnesota utilities already adopt in filings to the Commission," in which utilities provide a resource planning sensitivity that uses a zero value for CO_2 externality costs, referred to as the "North Dakota" sensitivity.[30] This is a mischaracterization. The $0 per ton CO_2 externality cost sensitivity does not represent an assertion by utilities that the value of climate damages will be zero; it is provided to comply with a North Dakota statute that bars consideration of CO_2 externality costs in resource plans.[31] Just as utilities are bound to comply with

[29] CEO Exceptions at 16.
[30] CEO Exceptions at 19-20.
[31] N.D. Cent. Code §49-02-23. Available at http://www.legis.nd.gov/cencode/t49c02.pdf.

statutory requirements and Commission orders in Minnesota, and do so by including the Minnesota Commission's current externality ranges as base assumptions for resource planning, we are likewise bound to comply with statutory requirements and Commission orders of other states in which we operate.

IV. FUTURE UPDATES

Both the Agencies and CEO urge the Commission to update its selected CO_2 environmental cost values whenever the IWG updates the FSCC.[32] We disagree. While we argued that one advantage of Xcel Energy's proposal is that it is easily replicable and updateable if the IWG updates the FSCC, we did not recommend an automatic update without a new proceeding.

As noted in our Exceptions, the FSCC is strongly influenced by policy judgments that could be altered by a future IWG, resulting in dramatic changes to the FSCC. Indeed, the NAS will consider more comprehensive updates to the FSCC in a second phase of its assessment, which will evaluate updates not only to the latest climate science, but also to the choice of IAMs, damage functions, socioeconomic and emissions scenarios, presentation of uncertainty, and discounting.[33] If NAS recommends and a future IWG enacts changes to these elements of the methodology – many of them imbued with public policy judgments – the FSCC may change dramatically, upward or downward. The Commission, even if it accepts the scientific decisions of a future IWG, may or may not agree with its policy judgments. We recommend the Commission consider future IWG updates, but not automatically act to adopt them without fully considering the embedded policy judgments, and base its decision on a complete evidentiary record.

[32] Agencies Exceptions at 9-10; CEO Exceptions at 22-23.
[33] NAS Assessment of SCC at 17.

V. CONCLUSION

Climate change science and the level of our knowledge about potential damages from CO_2 emissions have advanced since the Commission adopted its CO_2 environmental cost range in 1997, and Xcel Energy agrees an update is warranted. The uncertainty remains significant, and many of the factors influencing the estimation of climate damages over long timeframes are as much matters of public policy as climate science, but these are not arguments against establishing new CO_2 environmental cost values. The Commission should revise the values as long as a reasonable and best available measure can be identified.

The record in this proceeding shows the FSCC executive summary values are not that reasonable and do not represent the best available measure. Those values are designed for a different purpose, do not constitute a range as required by statute, and do not according to the National Academy of Sciences appropriately convey the associated uncertainty. Adopting these values for use under Minn. Stat. §216B.2422 would lead to false precision and impracticable results. A reasonable and best available measure would be Xcel Energy's proposal – a true range, derived using percentiles that recognize the uncertainty on both low and high sides and balance risk tolerance with practicability. Unlike the FSCC, our range is specifically tailored to the intended application.

Hearkening back to the standard of review criteria that Xcel Energy proposed to help determine what constitutes a reasonable and best available measure – criteria ALJ Schlatter called "a useful set of guideposts for considering the CO_2 cost values"[34] – the FSCC executive summary values fare relatively poorly:[35]

[34] ALJ CO_2 Report at 130.
[35] See Ex. 601 (Martin Rebuttal) at 13-37 for our initial assessment of Parties' proposals against these criteria.

- They do constitute a *damage costs approach*, as defined by the Commission, and do *reflect absence of consensus on discount rate* – though not if the Commission adopts the 95th percentile value, which reflects a single discount rate. Xcel Energy's proposal likewise uses a damage cost approach, and gives equal weight to the FSCC results calculated at each discount rate.
- They do not *reasonably address uncertainty*, and do not *use statistically sound methods*. The FSCC executive summary values represent three average values and one 95th percentile, presented without the corresponding 5th percentile. All are point estimates that place greater emphasis on relatively improbable high damages than on possible low damages. The National Academy of Sciences critiqued this approach, recommending instead a symmetrical presentation of low and high percentiles. This is exactly the approach Xcel Energy took: since it is unknown how uncertainties and omissions on the low and high sides balance out, we used symmetrical percentiles to derive our initial range.
- They do not *reflect appropriate risk tolerance* or *yield a practicable range* when we consider how the Commission's CO_2 environmental cost values are used. Adopting all four FSCC executive summary values – from $12 to $123 per metric ton ($13.34 to $136.70, in 2014 dollars per short ton) for emissions in 2020 – might be appropriate if the Commission's only objective were to minimize risk tolerance, i.e., the risk that the actual value of climate damages lies above or below its range. But this is not the only objective, and a range from $13.34 to $136.70 would yield diametrically opposite PVSC rankings, pointing to two largely non-overlapping resource plans – thus not providing useful information for decision-making. Applying the CO_2 environmental cost values to their intended purpose under Minn. Stat. §216B.2422 requires a balancing of risk tolerance with practicability, and our proposal strikes that balance.

- They do not *minimize subjective judgments* – but no Party's proposal avoids subjective policy judgments. We do not claim Xcel Energy's policy judgments about how to balance uncertainty, risk tolerance and practicability are objective, only that they are more appropriate to the intended application.
- They are *replicable and updateable*, in the sense that the Commission could update its values when the IWG updates the FSCC. However, Xcel Energy recommends against any automatic update, since the Commission may or may not agree with a future IWG's policy judgments.

The question before the Commission is not whether the FSCC is credible or appropriate to its intended purpose of federal regulatory impact analysis. The question is whether it is reasonable and the best available measure for use under Minn. Stat. §216B.2422. Considering all the above, Xcel Energy contends that it is not, even with the ALJ's recommended adjustments to the FSCC executive summary values. We propose our CO_2 environmental cost range as a reasonable and best available measure. However, if the Commission decides to adopt the FSCC executive summary values, Xcel Energy would support the ALJ's recommended adjustments to shorten the modeling horizon and exclude the 95^{th} percentile value at 3 percent discount rate.

We commend the ALJ and all Parties to this proceeding for developing a thorough evidentiary record for a complex and important decision. Regardless where the CO_2 environmental cost values are set, Xcel Energy intends to continue our leadership in CO_2 reduction, seeking cost-effective ways to provide affordable, reliable, and increasingly clean energy for our customers.

CERTIFICATE OF SERVICE

I, Carl Cronin, hereby certify that I have this day served copies of the foregoing document on the attached list of persons.

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

xx by electronic filing.

Docket No: E999/CI-14-643

Dated this 16th day of May 2016.

/s/

_____

Carl Cronin
Regulatory Administrator

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