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February 19, 2018

—Via Electronic Filing—

Daniel P. Wolf
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/CI-17-53

Dear Mr. Wolf:

Northern States Power Company, doing business as Xcel Energy, submits the enclosed comments in response to the January 23, 2018 Request for Comments by the Minnesota Public Utilities Commission.

We have electronically filed this document with the Minnesota Public Utilities Commission, and copied parties on the attached service list. Please contact me at (612) 330-6255 or Nicholas.F.Martin@xcelenergy.com if you have any questions regarding this filing.

Sincerely,

/s/

NICHOLAS MARTIN
MANAGER, ENVIRONMENTAL AFFAIRS

Enclosure
Service Lists

STATE OF MINNESOTA
BEFORE THE
MINNESOTA PUBLIC UTILITIES COMMISSION

Nancy Lange	Chair
Dan Lipschultz	Commissioner
Matthew Schuerger	Commissioner
Katie J. Sieben	Commissioner
John A. Tuma	Commissioner

IN THE MATTER OF ESTABLISHING AN
ESTIMATE OF THE LIKELY RANGE OF
COSTS OF FUTURE CARBON DIOXIDE
REGULATION ON ELECTRIC
GENERATION UNDER MINN. STAT §
216H.06

Docket No. E999/CI-07-1199

Docket No. E999/CI-17-53

COMMENTS

OVERVIEW

Northern States Power Company, doing business as Xcel Energy, submits these comments in response to the January 23, 2018 Notice of Comment Period by the Minnesota Public Utilities Commission.

The Commission requests comments on the following topics:

- Should the Commission adopt the Agencies' recommendations?
- If not, what CO₂ values should the Commission set for the range of costs of future carbon dioxide regulation on electricity generation?
- In setting the likely range of costs of future CO₂ regulation, should the Commission consider a state- or regional-level cost of compliance as opposed to a national-level cost of compliance (such as the national CO₂ price developed by Synapse Energy Economics, Inc. in its March 2016 forecast)?
- Are there other issues or concerns related to this matter?

The Commission also requests information from utilities that filed initial Comments:

- In the initial comment period, utilities referenced third party forecasting services as a basis to set CO₂ Values in this case. Did any utility retain a third party vendor to produce a utility-specific and/or national compliance cost for the EPA Clean Power Plan? Is any utility aware of compliance cost estimates that could inform a state- or regional- regulatory scope?

- Using an average of 2010-2012 operations as a baseline, and using the most recently approved integrated resource plan (IRP) for forward-looking projections, please provide the utility’s total emissions reductions and carbon-intensity on the utility’s system. Please provide projections through the last year of the utility’s most recently approved IRP.

COMMENTS

A. CO₂ RANGE AND DATE OF APPLICATION

The Agencies propose a broad range of CO₂ regulatory costs, on the rationale that the landscape for CO₂ regulation is highly uncertain at this time. We agree. To summarize recent federal developments:

- The EPA’s Clean Power Plan (CPP), finalized in October 2015, was stayed by the U.S. Supreme Court in February 2016, and remains stayed pending the ongoing legal challenge at the D.C. Circuit Court. The latter court has held this litigation in abeyance pending EPA’s review of the rule.¹
- In October 2017, the EPA, acting under an Executive Order requiring federal agencies to review existing regulations that potentially burden the development or use of domestically-produced energy resources,² issued a proposed rule to repeal the CPP in its entirety.³ EPA has extended the comment period on this proposal through April 26, 2018, and is holding four public hearings.⁴ It is unknown how or when EPA will act on the final repeal.
- EPA in December 2017 issued an Advance Notice of Proposed Rulemaking (ANPR) requesting comment on whether it should issue a replacement to the CPP and if so, what form a replacement rule should take.⁵ Comments on the ANPR are due February 26, 2018. It is unknown whether EPA will ultimately replace the CPP, what form a replacement rule may take, and what options it will give states for flexibility in designing compliance plans – all of which will affect regulatory compliance costs for utilities and their customers.

¹ *West Virginia v. EPA*, No. 15-1363 (D.C. Cir.).

² Executive Order, “Promoting Energy Independence and Economic Growth,” § 1(c), 82 Fed. Reg. 16,093 (Mar. 28, 2017).

³ Proposed Rule, Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 82 Fed. Reg. 48,035.

⁴ Notice of three public listening sessions and that the public comment period will be reopened. Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; 83 Fed. Reg. 4,620.

⁵ Advance Notice of Proposed Rulemaking: State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units. 82 Fed. Reg. 61,507.

This uncertainty notwithstanding, Minn. Stat. §216H.06 requires the Commission to regularly update its estimate of the likely range of costs of future CO₂ regulation on electricity generation. We agree with the Agencies' general approach that a broad range is appropriate to reflect the current uncertainty. The range the Agencies propose uses actual carbon market pricing for its Low end (\$5 per ton), based on recent publicly-available Regional Greenhouse Gas Initiative auction results), and publicly-available carbon pricing forecasts for its High end (\$25 per ton – the upper end of a March 2016 forecast by Synapse Energy Economics).

The Agencies note that the Synapse forecast preceded most of the federal regulatory developments summarized above, and may be a high estimate of likely regulatory costs. We agree this is likely the case, considering that most CPP allowance price estimates were lower – and considering that Xcel Energy and other utilities are taking advantage of ongoing renewable energy cost declines and low natural gas prices to exceed what would have been their reduction obligations under the CPP. Nonetheless, we can support establishing the range at \$5 to \$25 in the current uncertain environment, and updating it as the regulatory landscape becomes clearer.

As to date of application, we agree with the Agencies that CO₂ regulation is unlikely to impose costs on utilities and their customers before 2025. CPP compliance would have begun in 2022, but considering EPA's proposed repeal, the time needed to develop a replacement rule if EPA chooses to do so, and the time required for states to develop compliance plans, requiring utilities to apply the CO₂ regulatory range in their resource plans beginning in planning year 2025 is appropriate.

B. STATE, REGIONAL, OR NATIONAL COST OF COMPLIANCE

The Notice next asks whether the Commission should consider state- or regional-level compliance cost estimates, as opposed to national estimates. Several federal agencies and non-profit think-tanks prepared forecasts of carbon pricing under the CPP, some of which included state- or regional-level carbon pricing based on assuming states might allow intra- and interstate emission credit trading in their CPP implementation plans.⁶

Therefore some state- and regional-level CPP carbon price forecasts are available, and we are willing to summarize them if the Commission desires. However, we believe

⁶ CPP modeling of which the Company is aware included the EPA's own CPP Regulatory Impact Analysis, modeling by the USDOE Energy Information Agency, and modeling by the Bipartisan Policy Center, Electric Power Research Institute, MJ Bradley & Associates, National Electric Reliability Corporation, MISO, Nicholas Institute, Resources for the Future, and Union of Concerned Scientists.

they would not be useful to consider as a basis for the Commission’s CO₂ regulatory cost range at present. EPA has proposed to repeal the CPP, and it is unclear what regulatory approach will replace it. Regardless, few expect the CPP to be enacted in the form finalized in October 2015 and modeled by the organizations mentioned in the footnote. We therefore do not recommend state or regional CO₂ pricing based on the CPP, and we support the Agencies’ recommendation to use a broad range from \$5 to \$25 pending greater regulatory clarity.

C. OTHER ISSUES OR CONCERNS

1. *Relationship Between CO₂ Regulatory and Externality Values*

In their January 19, 2018 Analysis and Recommendations, the Agencies raise the issue of the relationship between CO₂ regulatory costs under Minn. Stat. § 216H.06 and the Commission’s recently updated CO₂ environmental costs (or CO₂ Externality) range under Minn. Stat. § 216B.2422, subd. 3. While the two ranges are not directly comparable, the Agencies note that “... they both reflect steps to account for the burdens that CO₂ emissions impose on third parties,” so it would not be appropriate to apply them additively.⁷

This does not mean regulatory and externality values cannot be combined in a single modeling run – merely that only one or the other should be used in a given planning year. Based on this guidance, utilities’ established practice is to apply CO₂ Externality Values in planning years up until the planning year that CO₂ Regulatory Costs go into effect. The Agencies recommend no change to this practice, nor do we.

In our September 22, 2017 Comments, we discussed the interplay of the two ranges, asserting that the reasons underlying the Commission’s original decision to apply the ranges separately remain valid and should be preserved. We also explained how we intend to use these values in our modeling *Reference Case* and *Sensitivities*.

In the *Reference Case* (also called Base Assumptions), we propose to apply the CO₂ Regulatory Cost midpoint in each year beginning in 2025; we refer to this as the Regulatory Cost Period. In the years preceding the Regulatory Cost Period (the Pre-Regulatory Cost Period), we propose to apply an Externality Value to reflect that CO₂ emissions impose an externalized damage cost in those years, even though not yet regulated. Table 1 below illustrates our Reference Case assumptions. This Reference

⁷ Agencies’ January 19, 2018 Analysis and Recommendations, quoting December 21, 2007 *Order Establishing Estimate of Future Carbon Dioxide Regulation Costs*: “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 the CO₂ regulatory cost estimate.”

Case complies with Commission guidance by applying a Regulatory Cost or Externality Value, but not both, in each planning year.

Table 1: Application of Regulatory Cost and Externalities Values – Reference Case

	Pre-Regulatory Cost Period (years prior to 2025)		Regulatory Cost Period (2025 and beyond)	
	Regulatory Cost	Externality Value	Regulatory Cost	Externality Value
Reference Case	None	Low	Midpoint of Agencies' range	None

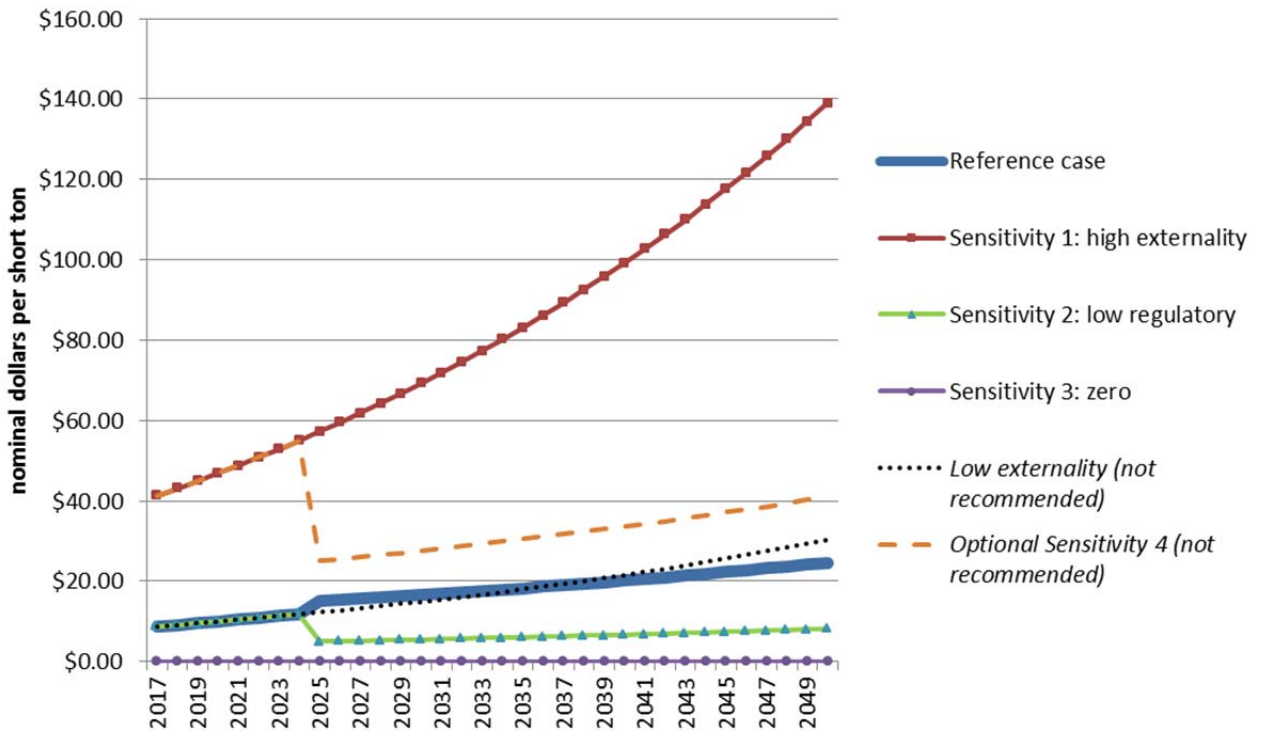
Meanwhile, *Sensitivities* are used in resource planning to represent a reasonable range of possible outcomes to test the robustness of the Reference Case. Our principles in choosing sensitivities include: 1) a broader range of sensitivities provides greater decisional value for the Commission and stakeholders; 2) sensitivities that are very close to the Reference Case provide little added value; 3) the overall number of sensitivities should be reasonable, considering there will also be sensitivities for many other variables and input assumptions. Table 2 shows our proposed sensitivities. Figure 1 illustrates both the Reference Case and Sensitivities.

Table 2: Application of Regulatory Cost and Externalities Values – Sensitivities

	Pre-Regulatory Cost Period (years prior to 2025)		Regulatory Cost Period (2025 and beyond)	
	Regulatory Cost	Externality Value	Regulatory Cost	Externality Value
Sensitivity 1 (high externality)	None	High	None	High
Sensitivity 2 (low)	None	Low	Low end of Agencies' range	None
Sensitivity 3 (zero) ⁸	None	None	None	None
<i>Optional Sensitivity 4 (not recommended)</i>	<i>None</i>	<i>High</i>	<i>High</i>	<i>None</i>

⁸ The Commission's January 3, 2018 Order in Docket No. CI-14-643 requires consideration of Low, High, and zero externality sensitivities: "Combining the higher discount rate with the shorter time horizon generates the lowest practicable estimate of CO₂ costs. Combining the lower discount rate with the longer time horizon generates the highest practicable estimate. By considering resource plans prepared with these costs—along with a scenario that excludes consideration of externality costs—the Commission will gain insight into the magnitude of the CO₂-related stakes in any resource choice." Order at page 32.

Figure 1: Proposed Reference Case and Sensitivities⁹



We noted in our September 22, 2017 Comments that we could theoretically run sensitivities using low and high CO₂ Externality Values, and low and high CO₂ Regulatory Costs throughout the Regulatory Cost period. But the midpoint of the Agencies’ proposed Regulatory Cost range (heavy blue line) and the low CO₂ Externality Value (dotted black line) are coincidentally nearly identical. A Sensitivity using the latter, while theoretically distinct, would provide nearly identical results to the Reference Case in Present Value of Societal Cost (PVSC) terms, which would not be useful. A Sensitivity using the high CO₂ Regulatory Cost (orange dashed line) differs from the Reference Case would provide somewhat of an intermediate PVSC result between the Reference Case and high Sensitivity.

However, considering the goals of limiting the number of Sensitivities to those that provide tangible added decisional value, we proposed running *Sensitivities* at the lowest CO₂ cost/value and the highest CO₂ cost/value, regardless of whether these represent Regulatory Costs or Externalities Values. The Agencies asserted that this option is not theoretically sound because the CO₂ Regulatory Costs and Externality Values represent different things, saying:

⁹ The CO₂ externality values in the January 3, 2018 Order are in 2015 dollars per short ton. We have used a 2 percent inflation escalator to convert these to nominal dollars. When the CO₂ regulatory cost values take effect in 2025, we also escalate these at 2 percent per year.

The externality value range reflects third-party damages, while the regulatory cost of carbon range is intended to capture the expected cost to the utility to comply with future emissions regulations (expected internal cost).¹⁰

We agree with the Agencies on what the two ranges represent. We believe, however, that applying these values as *Sensitivities* is practical. The Agencies acknowledge that conducting four modeling runs to reflect the high and low Externality Value for each respective year and the high and low Regulatory Cost for each year – in addition to the Reference Case – may not provide results significant enough to warrant the extra time and effort. As Figure 1 above shows, the low CO₂ Externality Value and high CO₂ Regulatory Cost provide limited additional information for Commission decision making.

Therefore, running *Sensitivities* in the Regulatory Cost period as we propose (at the lowest CO₂ cost/value and the highest CO₂ cost/value), regardless of whether these represent Regulatory Costs or Externalities Values is practical, efficient, and will provide greater decisional value for the Commission and stakeholders. We respond to the Agencies discussion about how the Regulatory Costs and Externalities Values impact the Strategist modeling below.

2. *How CO₂ Values are Used in Strategist Modeling*

The Agencies also discuss differences in how the CO₂ Regulatory Costs and Externality Values impact utilities' modeling. They note:

The cost of future carbon regulation is modeled as an internal cost (on an ex ante basis), and therefore impacts the resources the model selects to be added or retired. In contrast, the externality value range is applied on an ex post basis once the model selects the resource package, and therefore impacts the estimated cost of the various resource portfolios, but does not influence which resources the model selects to include in the portfolios.¹¹

Since they are a proxy for *actual* costs that will be borne once regulations are in effect, the CO₂ Regulatory Costs are appropriately included in the dispatch of resources. When we run our Reference Case, the CO₂ Regulatory Cost midpoint is included in the dispatch costs of fossil fuel-fired units, and affects how much they run in the model. This alters the dispatch order, relative to a scenario without CO₂ Regulatory

¹⁰ Agencies' Analysis and Recommendations at page 7.

¹¹ Agencies' Analysis and Recommendations at page 7.

Costs, and affects the overall portfolio of resources shown as most economic. In the extreme, it could cause the dispatch of a unit to fall sufficiently that a utility would decide it has become uneconomic and propose retirement of that unit.

In contrast, the CO₂ Externality Values reflect, by definition, *externalized* costs that are not borne by utilities or their customers. As such, the CO₂ Externality Values are not included in dispatch costs in any run – Reference Case or Sensitivities – and do not affect the dispatch order. Instead they affect the PVSC ranking of different potential plans – causing a plan with more fossil resources to have a higher PVSC relative to a plan with fewer fossil resources, all else being equal.

Therefore, both CO₂ Regulatory Costs and CO₂ Externality Values may impact resource selection, additions/retirements, the PVSC ranking of portfolios, and the Commission's ultimate decision on the optimal plan. But the Agencies are correct that CO₂ Externality Values are applied *ex post* and only CO₂ Regulatory Costs impact the dispatch of resources in Strategist.

The implications for our proposed modeling are as follows:

- In the *Reference Case*, the midpoint of the Agencies' proposed Regulatory Cost range would be included in dispatch from 2025 on. Prior to 2025, no CO₂ amount would be included in dispatch (since no CO₂ Regulatory Costs are borne by dispatched units); however, the low CO₂ Externality Value would be applied and would impact the PVSC of resource portfolios modeled.
- In *Sensitivity 1*, no CO₂ amount would be included in dispatch in any year, but the high CO₂ Externality Value would impact PVSC in all years (Pre-Regulatory and Regulatory Cost Period).
- In *Sensitivity 2*, the Low end of the Agencies' proposed Regulatory Cost range would be included in dispatch from 2025 on. The low CO₂ Externality Value would impact PVSC until 2025.
- In *Sensitivity 3*, per the Commission's Order, no CO₂ amounts would be included in dispatch, nor impact PVSC, in any years.

An optional fourth sensitivity is theoretically possible, which we show in Table 2 as not recommended. This would be a variant of Sensitivity 1 in which the high CO₂ Externality Value is used in the Pre-Regulatory Cost Period (not included in dispatch, but impacting PVSC); and the CO₂ high Regulatory Cost (but no Externality Value) is included in dispatch in the Regulatory Cost Period. We question the usefulness of this Sensitivity for two reasons. First, the current CO₂ regulatory environment and the low costs of renewable energy and natural gas do not support the notion that a CO₂ Regulatory Cost as high as \$25 per ton will be borne by fossil units starting in 2025.

Second, such a Sensitivity would use the Commission's recently updated high CO₂ Externality Value for only seven years, and would not reflect an estimate of climate damages in PVSC ranking of plans after 2025.

D. UTILITY-SPECIFIC AND/OR NATIONAL CPP COMPLIANCE COST ESTIMATES

The Notice states that utilities referenced third-party forecasting services as a basis to set CO₂ values, and asks whether any utility retained a third-party to produce a utility-specific and/or national compliance cost for the CPP. It asks whether any utility is aware of compliance cost estimates that could inform a state- or regional- regulatory scope.

Xcel Energy did not propose third-party forecasting services as a basis for CO₂ Regulatory Costs; in our September 22, 2017 Comments, we pointed to publicly available CO₂ allowance auction results for RGGI and California/Quebec. We did in 2016 retain a third-party vendor, ICF International, to conduct Company-specific analysis of the CPP on behalf of Xcel Energy, using the Company's assumptions and scenarios. One result of this analysis was that across several policy cases modeled, carbon prices in our jurisdictions were generally projected to be low – \$6 per ton and below – to 2030. This is in part because the Company already has plans to reduce its CO₂ emissions below what the CPP would have required, through a combination of renewable energy additions, natural gas additions, coal retirements, and maintaining our nuclear units.

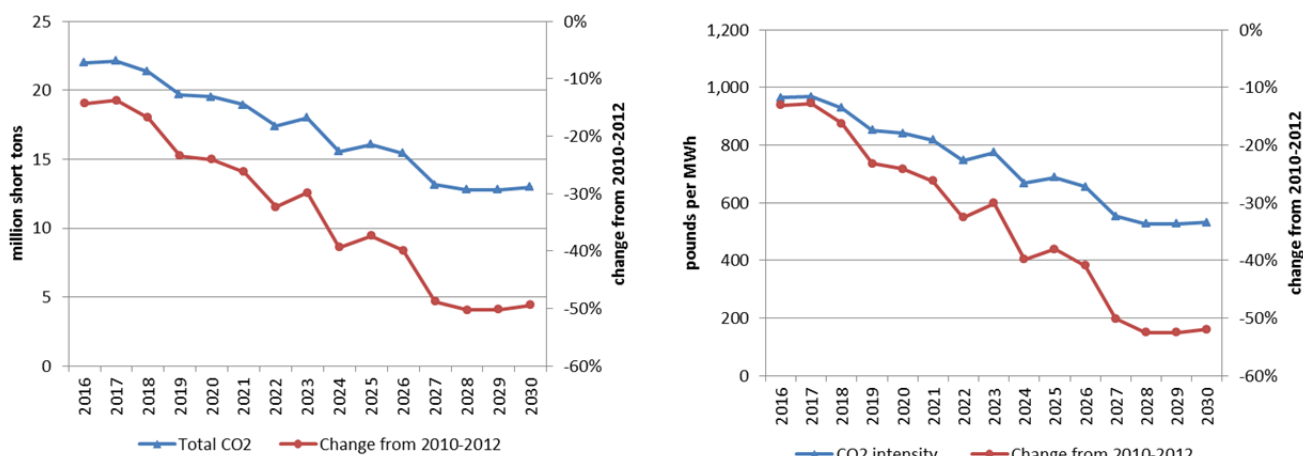
We do not, however, propose the ICF analysis, or any other CPP-based analysis, for determining utility-specific CO₂ regulatory costs. Few now expect the CPP to be enacted in the form finalized in October 2015, and it is unclear what regulation will replace it – making CPP-based estimates a poor basis for estimating CO₂ Regulatory Costs. Likewise, as noted above we are aware of state- and regional-level carbon price forecasts for the CPP (see footnote 6), but for the same reason, we do not believe these should inform the Commission's CO₂ Regulatory Cost range.

E. TOTAL EMISSIONS REDUCTIONS AND CARBON-INTENSITY PROJECTIONS

Finally, the Notice asks utilities to provide their total emissions reductions and carbon intensity on the utility's system, using an average of 2010-2012 operations as a baseline, and provide forward-looking projections under the utility's most recently approved Integrated Resource Plan (IRP).

Figure 2 below shows these forecasts under our *Upper Midwest Resource Plan for 2016-2030* as approved by the Commission.¹² Since that approval however, we have added significant wind resources to our portfolio and announced an aspirational goal that would take our total CO₂ and CO₂ intensity significantly lower than reflected in the figures below.¹³ We will reflect these changes and plans in our next IRP, due to be filed February 1, 2019. We also note that Xcel Energy generally uses 2005 as a baseline, consistent with the Next Generation Energy Act statewide goals – so, the percentage reductions shown in the Figure 2 do not reflect reductions achieved between 2005 and the 2010-2012 average, and therefore the reductions shown below are smaller than our publicly announced goals.

Figure 2: Total CO₂ Emissions (left) and CO₂ Intensity (right) Relative to 2010-2012 under Xcel Energy’s Upper Midwest Resource Plan for 2016-2030



¹² See Order, Docket No. E-002/RP-15-21 (January 11, 2017).

¹³ We have received approval for a 1,550 MW wind portfolio – and proposed an additional 300 MW – for a total of 1,850 MW of additional wind resources, compared to at least 1,000 MW reflected in the Commission’s Order approving our latest IRP.

CONCLUSION

Xcel Energy appreciates the opportunity to provide these comments and response to the Commission's Notice.

Dated: February 19, 2018

Northern States Power Company

CERTIFICATE OF SERVICE

I, Jim Erickson, 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

xx electronic filing

DOCKET NOS. E999/CI-07-1199
E999/CI-17-53

Dated this 19th day of February 2018

/s/

Jim Erickson
Regulatory Administrator

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