

Staff Briefing Papers

Meeting Date April 30, 2020 Agenda Item **3

Company All Electric Utilities

Docket No. **E999/CI-07-1199**
E999/DI-19-406

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

Issues What should the Commission establish as the likely range of costs for future CO₂ regulation on electricity generation?

In what year should the costs begin to be applied?

Should the Commission modify how it has instructed utilities to model scenarios of CO₂ regulatory and externality costs?

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 **Relevant Documents**

Date

Docket No. E999/DI-19-406

Department of Commerce and Minnesota Pollution Control Agency ("the Agencies"), *Request for Comments*

July 9, 2019

Otter Tail Power, *Comments*

August 22, 2019

Minnesota Power, *Comments*

September 6, 2019

Minnesota Large Industrial Group, *Comments*

September 6, 2019

Xcel Energy, *Comments*

September 6, 2019

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The attached materials are work papers of the Commission Staff. They are intended for use by the Public Utilities Commission and are based upon information already in the record unless noted otherwise.

✓ **Relevant Documents**

	Date
Clean Energy Organizations, <i>Comments</i>	September 6, 2019
Great River Energy, <i>Comments</i>	September 6, 2019
Institute for Policy Integrity, <i>Comments</i>	September 6, 2019

Docket No. E999/CI-07-1199

DOC/PCA (Agencies), <i>Analysis and Recommendations</i>	December 17, 2019
Minnesota Power, <i>Comments</i>	January 24, 2020
Minnesota Large Industrial Group, <i>Comments</i>	January 24, 2020
Clean Energy Organizations, <i>Comments</i>	January 24, 2020
Xcel Energy, <i>Comments</i>	January 24, 2020
Great River Energy, <i>Comments</i>	January 24, 2020
Otter Tail Power, <i>Comments</i>	January 24, 2020
Clean Energy Organizations, <i>Reply Comments</i>	February 5, 2020
DOC/PCA (Agencies), <i>Reply Comments</i>	February 5, 2020
Minnesota Large Industrial Group, <i>Reply Comments</i>	February 5, 2020
Xcel Energy, <i>Reply Comments</i>	February 5, 2020

I. Statement of the Issues

What should the Commission establish as the likely range of costs for future CO₂ regulation on electricity generation?

In what year should the costs begin to be applied?

Should the Commission modify how it has instructed utilities to model scenarios of CO₂ regulatory and externality costs?

II. Background

A. Legislative History

Minnesota Statute [§ 216H.06](#) (the Statute) requires the Commission to establish and regularly update an estimate of the likely range of costs of future carbon dioxide (CO₂) regulation on electricity generation:

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.

Staff notes three things about the language in the Statute:

- 1) The language “all electricity generation resource acquisition proceedings” refers to proceedings such as Integrated Resource Plan (IRP) and Certificate of Need (CN) dockets, where a utility plans or proposes to add a generation resource to meet a capacity, energy, or mandated need.
- 2) The Statute established a unique procedural path, in that it directs both a Department Investigation (DI) docket, which is conducted jointly by the Department of Commerce and Minnesota Pollution Control Agency (“the Agencies”), and a subsequent Commission Investigation (CI) docket.¹ Both dockets generally receive comments from the same parties; typically, there is one set of comments in the DI docket used to inform the Agencies’ report, and the CI docket will receive comments and reply comments.

¹ Each DI docket is assigned a different docket number every time the Agencies revisit the cost values. However, the same docket, Docket No. 07-1199, has been used for every Commission Investigation.

- 3) The word “likely” is often a source of dispute among parties. In the absence of a specific state or federal CO₂ tax or cap-and-trade program on which to estimate compliance costs, parties can have different views, and place different weight, on what is “likely” to happen in the future. This, in turn, leads to a variety of perspectives on both the magnitude of the costs and the year by which future CO₂ regulation creates costs to utility operations.

B. Relationship to the Commission’s Environmental Externalities

Importantly, the range of CO₂ regulatory costs under consideration in this case is separate from the Commission’s recently-updated environmental externality values, which measure the social impact of CO₂ emissions. The CO₂ values the Commission is directed to establish in this docket are estimates of regulatory costs incurred to comply with anticipated environmental policy. However, both types of CO₂ costs are required to be used in resource acquisition proceedings.

Some key differences between the two types of costs include:

- CO₂ regulatory costs represent a forecasted rate impact from carbon regulation, whereas externalities reflect damages to society as a result of CO₂ emissions.
- CO₂ regulatory costs are reviewed annually (approximately), whereas environmental externalities were established in 1997 and updated in 2018.
- Some groups model the two types of costs differently. Otter Tail, for example, incorporates both regulatory costs and externalities into a facility’s dispatch cost (although not in the same scenario). Xcel and the Department, conversely, incorporate only regulatory costs into the dispatch cost, and externalities are applied *ex post* to the possible expansion plans in a model run, which changes the overall ranking of plans.

In the Commission’s inaugural order in the instant docket, the Commission determined that the regulatory costs and environmental costs should not be additive. So, to avoid double counting CO₂-priced emissions, the Commission’s December 21, 2007 Order stated:

In estimating costs associated with CO₂ emissions for the purpose of analyzing electricity generation resources, a utility need not apply CO₂ externality costs derived pursuant to § 216B.2422, subdivision 3, to CO₂ emitted in any year to which the utility applies the CO₂ regulation costs derived pursuant to Minnesota Statutes § 216H.06.²

Prior to the Commission’s update to the externalities, the CO₂ externality value was fairly low, at least relative to the CO₂ regulatory cost. So when the Commission last updated the CO₂

² *In the Matter of Establishing an Estimate of the Costs of Future Carbon Dioxide Regulation on Electricity Generation Under Minnesota Statutes § 216H.06*, Commission Docket No. E-999/CI-07-1199, ORDER ESTABLISHING ESTIMATE OF FUTURE CARBON DIOXIDE REGULATION COSTS, at 11 (December 21, 2007).

regulatory costs in June 2018, it wanted to ensure that both the CO₂ regulatory costs and the externalities would be meaningfully used and reflect their differences in purpose. Thus, the Commission adopted a new policy regarding how utilities should reconcile the needs of Minn. Stat. §§ 216B.2422 (the IRP Statute) and 216H.06. Specifically, the Commission directed electric utilities to include scenarios that:

- Incorporate, for all years, the low end of the range of environmental costs for CO₂ as approved by the Commission in its January 3, 2018 Environmental Externalities Order;
- Incorporate, for all years, the high end of the range of environmental costs for CO₂ as approved by the Commission in its Environmental Externalities Order;
- 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; and
- 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.

Below is a tabular representation of the Order's requirements listed above:

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
Omitting CO₂ Cost Considerations	-	-	-	-

C. The Commission's 2018 CO₂ Regulatory Costs Order

Staff notes that many of the parties' arguments in this case are similar to their comments in the Commission's previous investigation. For this reason, staff will discuss a few issues the Commission addressed in its June 2018 Order, so the Commission can revisit its responses to some of the arguments used again in this round of comments.

First, in the last investigation the Clean Energy Organizations (CEOs) urged the Commission not to reduce the CO₂ regulatory cost range from \$9-\$34/ton to the Agencies' recommended \$5-\$25/ton range it is currently. The Commission ultimately agreed with the Agencies that lowering the range would be reasonable due, in part, to declining costs to decarbonize:

[R]ecent developments have reduced the average amount of CO₂ that a utility must generate, both per kilowatt-hour, and in aggregate, and thus reduced the costs that utilities incur for managing CO₂ emissions ... In short, a reduction in regulatory costs does not reflect a loss of will to regulate CO₂ emissions; it reflects the success that utilities have achieved in reducing these emissions. In sum, the cost of complying with likely CO₂ regulations has declined. The Commission's decision will reflect this fact.³

Second, the CEOs also supported a date of applicability sooner than 2025. The Commission determined that changes in the regulatory climate – in particular the proposed repeal of the Clean Power Plan – justify extending the date by which utilities would likely need to begin incurring CO₂ regulatory costs.

Third, the Minnesota Large Industrial Group (MLIG) proposed a later (2035) effective date, arguing that if utilities plan on bearing costs too soon, this error could lead them to acquire resources that are needlessly expensive. The Commission disagreed for the following reasons:

The Commission does not find this argument persuasive. As an initial matter, identifying the date by which utilities incorporate regulatory costs into their resource planning and acquisition models does not determine the manner in which utilities incorporate those costs. [Also], the cost of adopting an unduly early date must be weighed against the cost of picking an unduly late one—an error that might prompt a utility to acquire apparently cheaper sources of generation that ultimately incur higher costs due to their CO₂ emissions. The Commission appreciates MLIG's objective of avoiding adding needless complexity to resource planning. But while the Commission seeks to avoid making planning needlessly complex, Minn. Stat. § 216H.06 is designed to ensure that planning is appropriately rigorous to address foreseeable risk. The Commission concludes that an implementation date of 2025 best achieves this purpose.⁴

D. Procedural Background

By September 6, 2019, in Docket No. DI-19-406, comments were received from the following stakeholders:

- Clean Energy Organizations (CEOs)
- Great River Energy (GRE)
- Institute for Policy Integrity

³ Commission Order, p. 4-5.

⁴ Commission Order, p. 6-7.

- Minnesota Large Industrial Group (MLIG)
- Minnesota Power (MP)
- Otter Tail Power (OTP)
- Xcel Energy (Xcel)

On January 24, 2020, in Docket No. CI-07-1199, the following stakeholders filed Initial Comments:

- Clean Energy Organizations
- Great River Energy
- Minnesota Large Industrial Group
- Minnesota Power
- Otter Tail Power Company
- Xcel Energy

On February 5, 2020, the CEOs, the Department, MLIG, and Xcel filed Reply Comments.

III. Agencies' Report

There are essentially four issues the Agencies addressed in their report: 1) the range of likely costs; 2) the effective date; 3) the modeling scenarios; and 4) whether the established values should be applied to proceedings in 2020 only, or in 2020 *and* 2021.

All commenters are in agreement on the last issue – that the values the Commission establishes should apply to proceedings in both 2020 and 2021 – so staff will not raise it again in this briefing paper.

For the other three issues, parties were mostly in agreement, with some exceptions. However, some took different positions on these issues in the DI docket, but they chose not to object to the Agencies' recommendations in the CI docket.

The Agencies recommend the Commission continue to use the \$5-\$25 per short ton range for the likely regulatory costs. The report states:

Most commenters stated that the current \$5-\$25 per ton regulatory cost range remains reasonable. Only the CEOs asserted that this range is unreasonably low given the potential for a dramatically different political landscape which could lead to the enactment of significant carbon emissions prices in the near future ... While we acknowledge that the CEOs have made some very good points, the Agencies conclude that there is not sufficient objective basis for revising the current cost range of \$5-\$25 per ton.⁵

⁵ Agencies report, pp. 2-3.

The Agencies also recommend the Commission continue to use the current 2025 year to begin applying the values. The report states:

[T]here is not sufficient objective basis for revising the current 2025 threshold year already decided by the Commission in 2018. 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 June 2018. The Agencies believe that this uncertainty weighs in favor of keeping current decisions in place rather than overturning them.⁶

Finally, the Agencies discussed parties' comments regarding the Commission's required modeling scenarios and how parties believe regulatory and externality costs should be applied:

Some commenters expressed minor objections to the complexity or lack of clarity as to how these values should be applied in integrated resource plans (IRPs). The MLIG stated that the Commission's required planning scenarios are overly complex and should be simplified. GRE stated that the Commission should provide a more formal outline of what costs should be included in which IRP runs. The CEOs objected to how these values are generally applied in various planning scenarios; specifically, they maintained that the regulatory and environmental cost values should be applied in reference or base-case planning scenarios and not just as "sensitivity" scenarios. Xcel, again, expressed a middle ground, saying that the current scenarios required by the Commission are reasonable, and, in fact, have already been applied by Xcel in its currently pending IRP (Docket No. E002/RP-19-368).⁷

The CEOs and the Agencies had different views on the modeling scenarios; in particular, the CEOs argued CO₂ values should be included in a utility's base case assumptions. The Agencies responded that whether a particular set of assumptions is included in the base case or a separate run is irrelevant, since the different modeling runs are used to test the impact, or importance, of the assumption to the modeling results. As stated in the report, the Agencies recommend no changes to the modeling scenarios defined in the Commission's June 11, 2018 Order:

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/sensitivities.⁸

⁶ Agencies report, pp. 3-4.

⁷ Agencies report, p. 4.

⁸ Agencies report, p. 4.

IV. Party Comments

Except for the Institute for Policy Integrity, all parties who submitted comments in the DI docket also submitted comments again in the CI docket. And as mentioned, some parties had different recommendations initially, but many of those parties did not object to the Agencies' recommendation to continue the status quo for proceedings in 2020 and 2021.

A. Effective Year

In the DI docket, the date the values would be applied, i.e. the effective year, was the issue with the widest range of viewpoints. The table below shows the parties' initial recommendations for the effective year from their September 6, 2019 comments:

Party	Sept. 2019 Recommendation for Effective Year
Agencies	2025
Clean Energy Orgs.	2023
Great River Energy	2028
Minnesota Power	2030
MLIG	2037
Otter Tail Power	2028
Xcel Energy	2025

Some examples of parties' initial comments on the effective year are presented below:

- CEOs:** "Though there is considerable uncertainty regarding the timing of future CO₂ regulations, the current effective date of 2025 is overly conservative. Policy changes at the state or federal level could require generators to begin incurring regulatory costs for CO₂ emissions starting as early as 2021. This possibility should be considered in planning to prevent electricity customers from being exposed to unnecessary regulatory risk. Based on the potential for federal or state action regulating greenhouse gas emissions, CEOs recommend an effective date of 2023. This is a more reasonable estimate of when generators could be required to comply with carbon regulations."⁹
- GRE:** "GRE uses Wood Mackenzie (WoodMac) for industry information and cost analysis. WoodMac estimates that 2028 is the first year in which federal carbon pricing would come into effect. This is absent any dynamics with potential state policy, and only considers the potential future cost of carbon regulation from the federal level. GRE agrees with this estimate and considers any date before 2028 to be problematic from a

⁹ CEOs, September 6, 2019 comments, p. 6.

policy and implementation standpoint. GRE recommends 2028 as the first year for the application of the value range.”

- **MP:** “Based on proprietary industry resources, as well as the anticipated lead-time required for implementation of a federal regulation for CO₂, application of a CO₂ regulation is not anticipated before 2025. With the recent repeal of the Environmental Protection Agency’s Clean Power Plan and publication of the Affordable Clean Energy (or ACE) Rule, submittal of State Implementation Plans (SIPs) or Federal Implementation Plans (FIPs) for the ACE Rule are anticipated to occur in the 2022-2023 timeframe ... Minnesota Power notes that 2030 may be a more appropriate threshold year for the application of the value range based on a purchased independent IHS Markit forecast used in Resource Planning. However, while the Company’s view is 2030 is a more appropriate threshold year, it does not object to 2025 remaining the threshold year.”¹⁰
- **MLIG:** “To account for the extremely speculative nature of this cost, as well as reflect the fact that developments on the federal regulatory front are proceeding very slowly, MLIG maintains its position that after the current planning periods or later is the appropriate timeframe in which to begin applying the regulatory cost of carbon emissions. As noted in the Agencies’ 2017 request for comments, the United States Supreme Court previously stayed the Clean Power Plan, which was further eroded by President Trump’s Executive Order in March 2017. Earlier this year, the EPA also issued the Affordable Clean Energy Rule effectively replacing the previous Clean Power Plan. This development further demonstrates that a regulatory cost of carbon emissions mandate is not likely in the foreseeable future.

Therefore, MLIG continues to believe that the proper threshold for implementing regulatory values is beyond the current planning period. By postponing the application of regulatory costs associated with CO₂ emissions until at least 2037, the application of such values is moved beyond utility planning periods for pending or soon-to-be-filed integrated resource plans. Additionally, while the regulatory cost of CO₂ emissions would be moved beyond the planning period, utilities may still model CO₂ emissions using the Commission-established environmental CO₂ emissions value in the interim.”¹¹

- **Otter Tail:** “Otter Tail uses the Wood Mackenzie energy price forecasts as the basis for our resource plan modeling. Wood Mackenzie assumes that a cost of carbon will begin in 2028. It is our opinion that using a start date of 2028 is more appropriate than 2025. There is currently no legislation pending for any type of carbon tax. Having such legislation in place to become effective by 2025 would be nearly impossible.”¹²

¹⁰ MP, September 6, 2019 comments, p. 3-4.

¹¹ MLIG, September 6, 2019 comments, p. 3-4.

¹² Otter Tail Power, August 22, 2019 comments, p. 1.

- **Xcel:** “The threshold year of application is intended to reflect the timeframe when the Commission believes utilities and their customers may begin incurring a CO₂ regulatory compliance cost, which could be under federal and/or state regulation.

The [U.S. EPA] ACE rule requires compliance beginning in 2024. It is possible this could be delayed, due to litigation and a potential stay of the rule during litigation, but that is unknown at this time. It is also possible Minnesota may implement some form of state-level carbon regulation, but the compliance timeframe is speculative at this time. Because we cannot rule out state or federal CO₂ regulatory costs being borne as early as 2025, we believe 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.”¹³

B. Proposed Range of Regulatory Costs

All except the CEOs believe the current CO₂ regulatory cost values are either reasonable or at least acceptable for planning purposes. Some comments include:

- **GRE:** “GRE is in favor of the continued use of \$5 to \$25 per short ton, with a midpoint of \$15 per short ton. This range of costs is reasonable and aligns with industry estimates that GRE consults for potential carbon costs.” (Staff notes that it did not include a \$15 midpoint in the decision options because GRE did not recommend a midpoint in its January 24, 2020 comments; moreover, GRE is free to include a \$15/ton midpoint in its next IRP.)
- **MP:** “Minnesota Power contracts with third-party vendor forecasting services to purchase independent power market forecasts for resource planning purposes ... The expected costs are within the \$5 to \$25 range proposed by the Agencies although the timing of the program is after the 2025 start.”¹⁴
- **MLIG:** “MLIG does not necessarily take issue with the current regulatory cost estimate range of \$5 to \$25, and the Group appreciates the Commission’s recognition of market forecasts in its determination to lower the regulatory cost of carbon emissions range in the 2018 Order.”
- **Otter Tail:** “Otter Tail believes that the current range of \$5 to \$25 with a midpoint of \$15 is reasonable and would favor continued application of this range by the Commission.”¹⁵

¹³ Xcel Energy, September 6, 2019 comments, p. 8.

¹⁴ MP, January 24, 2020 comments, p. 2.

¹⁵ Otter Tail Power, September 6, 2019 comments, p. 1.

- **Xcel:** “[Xcel] believes it would be reasonable to retain the current CO₂ regulatory costs range of \$5 to \$25 per short ton for the present update.”¹⁶

While most parties generally supported the Agencies’ recommended regulatory cost range, the CEOs did not. The Agencies’ report explains, “the CEOs asserted that this range is unreasonably low given the potential for a dramatically different political landscape which could lead to the enactment of significant carbon emissions prices in the near future.”¹⁷

The CEOs recommend two alterations to the range, which substantially increase the cost values (at least when considering the full time horizon). The CEOs recommend the Commission:

- Set the Low regulatory CO₂ cost value as the Regional Greenhouse Gas Initiative (RGGI) Emissions Containment Reserve (ECR) trigger price^{18,19} for years 2023-2030, and escalate the 2030 value at 7% annually for years after 2030; and
- Set the High regulatory CO₂ cost value as the inflation-adjusted High case forecast from Synapse Energy Economics’ (Synapse) Spring 2016 National Carbon Dioxide Price Forecast (which will be discussed below) for the relevant planning year.

Also, the CEOs initially recommended the Commission require utilities to use a midpoint of the range in the base case, but the CEOs appear to have dropped that recommendation after the Agencies issued its report.

Translated into a table, the CEOs’ recommended range (with a midpoint) is shown in Figure 6 of its January 24, 2020 comments, shown below:

Figure 6, CEO Recommendation

	Low	Mid	High
2023	\$6.87	\$18.47	\$30.08
2024	\$7.35	\$19.56	\$31.77
2025	\$7.86	\$20.69	\$33.51
2026	\$8.41	\$21.85	\$35.29
2027	\$9.00	\$23.05	\$37.10
2028	\$9.63	\$26.34	\$43.05
2029	\$10.30	\$29.73	\$49.16
2030	\$11.02	\$33.23	\$55.44

¹⁶ Xcel Energy, September 6, 2019 comments, p. 7.

¹⁷ Agencies report, p. 2.

¹⁸ The [RGGI website](#) explains the ECR as follows: “The Model Rule contains language for the creation and use of an emissions containment reserve (ECR) that will respond to supply and demand in the market if emission reduction costs are lower than projected. States will withhold allowances from circulation to secure additional emissions reductions if prices fall below established trigger prices.”

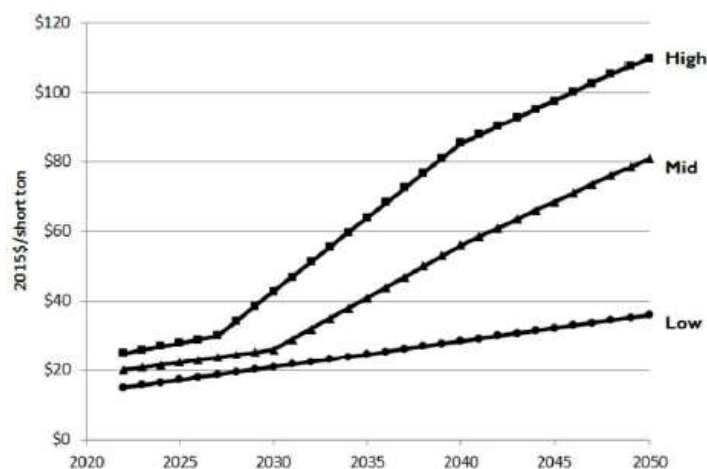
¹⁹ For further explanation of the ECR trigger price, see pages 2-3 of the CEOs’ September 6, 2019 comments in the DI docket and pages 7-8 of Xcel’s January 24, 2020 comments in the CI docket.

Importantly, the CEOs' proposed range used the same sources as the Agencies – that is, existing carbon markets and the Synapse forecast – to develop its recommendations. The differences between the Agencies' \$5-\$25/ton range and the CEOs' values listed above in Figure 6 can be explained by two key ways those sources were applied.

First, the CEOs believe future costs are better reflected by design aspects of carbon market programs, in particular RGGI's forward-looking ECR trigger price, rather than historical auction prices. Notably, the CEOs do not object to using existing carbon markets as a basis for the range, but they disagree that an average of historical auction prices by itself aligns with the Statute's directive to assess future costs. RGGI provisions, for example, escalate market prices annually, at roughly 7% per year, whereas the Agencies' values remain flat over time.

Second, the CEOs also do not object to the Agencies' recommendation to apply the 2016 Synapse CO₂ price forecast, just as the Agencies' previous report did. However, the CEOs argue that the Agencies' apply that forecast incorrectly. As shown by the figure below, in the Synapse forecast, like the RGGI provisions, CO₂ prices escalate over time.²⁰

Figure 5, Synapse 2016 CO₂ national price forecasts



Source: Synapse Energy Economics, Inc. 2016.

The CEOs agree the RGGI market is a reasonable proxy for Minnesota CO₂ regulatory costs, and they do not object to retaining the 2016 Synapse forecast as a reasonable basis for future values. The problem is that Agencies' range applies only recent auction prices, which remain constant, and only the first year of the Synapse forecast. The Commission should establish values that reflect escalating costs in both CO₂ markets and the Synapse forecast.

C. Modeling Scenarios

Almost all parties recommended the Commission retain its modeling scenarios required by its June 11, 2018 Order. MLIG opposed the scenarios and proposed that no externality costs

²⁰ Figure 5 is from page 6 of the CEOs' January 24, 2020 comments.

should be included in the regulatory cost scenarios. The Institute for Policy Integrity voiced its support for the recently updated environmental externality values. Some comments include:

- **GRE:** “GRE finds the scenarios outlined in the June 11, 2018 Order to still hold value and make sense from an analytical perspective, although the volume of duplicative runs required by the scenarios across all cases modeled could prove to be onerous and create a very large number of results for interpretation and analysis.”²¹
- **Institute for Policy Integrity:** “Minnesota should continue to require utilities to use environmental externality costs based on the best available science and economics in their resource planning ... The Commission should ensure that Minnesota maintains its role among states as a leader on sensible energy and climate policies, and should continue to require the use of the social cost of carbon in its utility resource planning rules.”²²
- **MLIG:** “MLIG remains opposed to the unnecessarily complex CO₂ emissions cost planning scenarios the Commission outlined in the 2018 Order [T]he scenarios previously ordered by the Commission create a challenging and illogical set of modeling assumptions for utilities to model.”²³
 ...
 “[I]t is not clear what benefit the low and high environmental/regulatory cost combination assumptions add to any analysis. It would appear to be more efficient to simply assume, for compliance with Minn. Stat. § 216H.06, there is no regulatory cost until 2037, with low and high values utilized going forward after 2037.”²⁴
- **MP:** “Minnesota Power does not suggest any changes to the scenarios listed in the Commission’s June 11, 2018 order.”²⁵
- **Otter Tail:** “The five application scenarios listed in the Commission’s June 11, 2018 order are still reasonable and appropriate. These scenarios explore the outer bounds of CO₂ costs and provides all parties adequate information to evaluate company resource plans. These five scenarios do not limit parties from providing additional scenarios should they wish.”²⁶

²¹ GRE, September 6, 2019 comments, p. 2.

²² Institute for Policy Integrity, September 6, 2019 comments, p. 3-4.

²³ MLIG, January 24, 2020 comments, p. 4.

²⁴ MLIG, January 24, 2020 comments, p. 5.

²⁵ MP, September 6, 2019 comments, p. 4.

²⁶ Otter Tail, August 22, 2019 comments, p. 3.

- **Xcel:** “The Company believes the five application scenarios required in the Commission’s June 11, 2018 Order remain reasonable. We have applied these scenarios in our recently filed 2020-2034 Integrated Resource Plan, where we used high CO₂ environmental costs through 2024 and high CO₂ regulatory costs thereafter as our reference assumption, and ran the remaining scenarios as sensitivities.”²⁷

V. Reply Comments

A. Xcel Energy

Xcel replied to the CEOs, Institute for Policy Integrity, and MLIG.

Response to the CEOs

Xcel emphasized that “the Statute directs the Commission to establish an estimate of the *likely* range of costs of CO₂ regulation, based on evidence currently available, not speculation what might happen at the federal or state levels.”²⁸ According to Xcel, it is not reasonable to assume a different political landscape at the federal level, and on top of that, high CO₂ regulatory costs as a result of more stringent CO₂ regulations. Xcel noted that if such changes were to occur, the Commission could re-open this docket whenever it finds necessary.

In addition, the CEOs propose a CO₂ cost range that is not representative of actual or expected CO₂ prices. Price floors and ceilings from existing cap-and-trade programs “are simply regulatory safeguards, built into the programs to contain prices within a range considered to be politically acceptable.”²⁹ Xcel cited the Agencies’ response to the CEOs proposal, which noted, “the trigger prices referenced by the CEO are not carbon dioxide trading prices, but only tools used by the regulators to influence the allowance market should the actual prices go too high or too low. The Commission declined to adopt the CEO’s recommendations on the cost range in the last cost of future carbon regulation update proceeding.”³⁰

Xcel also disagreed with the CEOs’ proposal to establish a range that would incorporate a Synapse national CO₂ price forecast from 2016 for the high end. Xcel noted the Synapse forecast was made at a time when the Clean Power Plan appeared the likely approach to power sector CO₂ regulation, but this is no longer an appropriate basis.

Finally, while the CEOs believe the Agencies’ range is flawed because it does not include an escalation rate, Xcel noted that it *does* escalate the CO₂ regulatory costs for inflation – currently at 2% per year – just as with other costs.

²⁷ Xcel, September 6, 2019 comments, p. 9.

²⁸ Xcel, January 24, 2020 comments, p. 3.

²⁹ Xcel, January 24, 2020 comments, p. 7.

³⁰ Xcel, January 24, 2020 comments, p. 7.

Response to Institute for Policy Integrity

The Institute for Policy Integrity supports requiring utilities to use the CO₂ environmental externality cost, which is based on the federal government's social cost of carbon. Xcel did not disagree that externalities are important to use, but Xcel stated that these comments are not germane to this docket since they do not comment on the regulatory costs.

Response to MLIG

Xcel disagreed with the MLIG's recommendation to move the effective year to 2037. Xcel argued that "there is no basis to conclude there will be no federal regulations affecting power sector CO₂ emissions until 2037, and state regulations could also impose costs sooner."³¹ Like Xcel's response to the CEOs, Xcel noted the Commission can adjust the values in future updates as federal and/or state regulatory developments occur.

B. Clean Energy Organizations

Response to Xcel

The CEOs clarified that it does not believe the Commission should ignore historical data from U.S. carbon pricing programs, as they provide concrete examples of carbon pricing. What the CEOs oppose is basing costs "solely on the prices today."³² Auction prices in carbon markets have increased significantly over time; the average RGGI auction price in 2019, for instance, was double the price cited by the Agencies in making their recommended Low value.

Further, auction prices in these markets will continue to increase moving forward. Market designs aim to limit the range of CO₂ prices within a given year, and program provisions signal the intention to actively intervene if auction prices fall outside of this range.

Xcel also claimed the CEOs proposed a "blended approach" that relied on a Synapse national CO₂ price forecast from 2016, and that this forecast is "no longer an appropriate basis" for regulatory CO₂ values. The CEOs pointed out that it was the Agencies that developed this "blended approach," not the CEOs, and this is the approach employed by the Agencies to develop the range currently in use.

Nevertheless, while the CEOs agree with Xcel that a three-year old forecast is not ideal, the Agencies' recommended High value – which Xcel supports – is based on this very forecast. The CEOs contend that if the Commission prefers to continue using the Agencies' approach, it would be more reasonable to use the actual Synapse forecast for each planning year rather than freezing the values at the 2022 forecast year. This would better accomplish the Agencies' objective of "projecting regulatory costs into the future, which corresponds to electric utility planning horizons."

³¹ Xcel January 24, 2020 comments, p. 9.

³² CEOs, February 5, 2020 reply comments, p. 1.

Response to the MLIG

The CEOs dispute the MLIG's recommended effective year of 2037 for three main reasons:

First, the CEOs disagree with the MLIG's claim that carbon regulation is "increasingly speculative." To the contrary, the CEOs argue, "there is growing urgency to reduce greenhouse gas emissions, and scientists, economists, politicians, and citizens around the state and across the world are calling for policies to reign in greenhouse gas emissions."³³

Second, moving the effective year beyond IRP timeframes inappropriately circumvents the Statute's requirements. According to the CEOs, "MLIG is effectively asking the Commission to take an end run around the legislative process and remove this statute from Minnesota Law."³⁴

Third, the CEOs reject the MLIG's assertion that the EPA's recent replacement of the Clean Power Plan implies anything about the future of likely carbon regulation. A potential carbon pricing program could take many forms that the MLIG ignores, including action taken by Minnesota. As expressed throughout the CEOs' filings, the potential for CO₂ regulation poses a financial risk to ratepayers, and the MLIG's recommendation will exacerbate this risk.

C. MLIG

Response to CEOs

The CEOs' recommendations rely on much stronger government regulations in the near future which do not exist today. While the CEOs claim the Agencies recommendations are "overly conservative," according to the MLIG the CEOs support their opposition only with speculation. In particular, the MLIG disagrees with establishing values that depend on election outcomes and future legislative actions.

Response to Xcel

Xcel stated in its comments that it "agree[s] that federal carbon regulation is not likely under the current Administration. However, there is no basis to conclude there will be no federal regulations affecting power sector CO₂ emissions until 2037, and state regulations could also impose costs sooner."³⁵

The MLIG argues that Xcel's comments actually lend support to the MLIG's recommendations; Xcel's comments, as well as the CEOs', indicate that they do not believe carbon regulation is likely in the near future. The MLIG suggests that, "instead of speculating about application

³³ CEOs, February 5, 2020 reply comments, p. 2.

³⁴ CEOs, February 5, 2020 reply comments, p. 3.

³⁵ Xcel, January 24, 2020 comments, p. 8.

dates, the Commission should remove the regulatory cost value to beyond the current planning period, as anything less is merely guessing.”³⁶

VI. Staff Analysis

A. *Comment on the Agencies’ Report*

It is worth keeping in mind that the Legislature required that the Commission make its decision following analysis and recommendations from the Agencies, which staff believes is an important directive. Staff interprets the Statute to mean that the Legislature viewed the Agencies’ expertise as uniquely instructive to the Commission’s decision to establish reasonable values. In other words, staff does not believe the Legislature’s intent was that the Agencies’ report would be considered merely as a set of party comments or a summary of the stakeholder comments, as doing so would give little purpose for having separate DI and CI dockets with the same intervenors.

Of course, the Statute is clear that, ultimately, it is up to the Commission to determine what constitutes a reasonable range of CO₂ regulatory costs. At the same time, staff also believes the Agencies’ recommendations should be given considerable weight in the decision-making process, due to the Agencies’ role under the Statute.

B. *Providing Value to Resource Acquisition Proceedings*

All parties acknowledge there is substantial uncertainty surrounding carbon regulation, but they have different views on what this means for decision-making in the present. For instance, the CEOs state that “there is growing urgency to reduce greenhouse gas emissions,”³⁷ which makes the Agencies’ recommended effective date of 2025 conservative. Conversely, MLIG contends that “it is still extremely speculative as to when a regulatory carbon emissions mandate will be imposed.”³⁸

Staff does not disagree with either claim. But the Commission does not need to be the arbiter over who is right or wrong for each argument, nor does it need to predict the future of one of the most controversial issues in American politics. Instead, the Commission might prefer that, so long as the Agencies’ recommended cost values have a reasonable foundation – and most seem to agree that they do – decision-making could come down to how maximize value to resource acquisition proceedings.

In staff’s view, the Agencies’ recommended range provides value in at least one important way: a \$5-\$25/ton range provides different and useful data points relative to the environmental externality values. This will help robustly test the sensitivity of how CO₂ pricing affects the selection (or retirement) of electric generating resources.

³⁶ MLIG, reply comments, p. 4.

³⁷ CEO, February 5, 2020 comments, p. 2.

³⁸ MLIG, January 24, 2020 comments, p. 3.

Below is a table showing the existing CO₂ externality values from 2020-2040 (note that the increase in values reflects the increasing societal damage of each incremental ton):

Environmental Cost Values for CO₂ (2020-2040)					
(2015 dollars per net short ton)					
<u>Year</u>	<u>Low</u>	<u>High</u>	<u>Year</u>	<u>Low</u>	<u>High</u>
2020	\$9.05	\$42.46	2031	\$11.30	\$52.37
2021	\$9.25	\$43.36	2032	\$11.51	\$53.27
2022	\$9.46	\$44.26	2033	\$11.71	\$54.17
2023	\$9.66	\$45.16	2034	\$11.92	\$55.07
2024	\$9.87	\$46.06	2035	\$12.12	\$55.97
2025	\$10.07	\$46.96	2036	\$12.33	\$56.87
2026	\$10.28	\$47.86	2037	\$12.53	\$57.77
2027	\$10.48	\$48.77	2038	\$12.74	\$58.67
2028	\$10.69	\$49.67	2039	\$12.94	\$59.58
2029	\$10.89	\$50.57	2040	\$13.15	\$60.48
2030	\$11.10	\$51.47			

Setting aside the fact that an environmental externality and a regulatory cost reflect different things, a \$5-\$25/ton range would appear to improve the assessment of price sensitivity to CO₂ in economic modeling.

To be clear, staff is not suggesting the Commission establish arbitrary CO₂ regulatory costs that are supportable only by their value relative to the externality values. But there is a general consensus that the Agencies' recommended cost values do indeed have a reasonable basis. The added benefit is that this particular regulatory cost range, when considered alongside the \$0 scenario and environmental externality values, might provide more ability to observe trends in carbon price sensitivity in resource selection proceedings.

With regard to the effective year, staff believes the Commission's rationale in its June 2018 order – that “the cost of adopting an unduly early date must be weighed against the cost of picking an unduly late one”³⁹ – remains sound. The 2025 effective year provides value to resource acquisition proceedings because it implies CO₂ regulation may not be imminent, but carbon-emitting generation has a real financial risk. In addition, the 2025 effective year strikes a reasonable balance between the different perspectives among the parties.

C. Modeling Scenarios

The Commission's June 2018 Order adopted Xcel's proposed method of blending, but not adding, together the newly updated environmental externality values and the CO₂ regulatory cost values. For this round of analysis, the Agencies asked parties in its Request for Comment “whether the application scenarios listed in the Commission's June 11, 2018 Order remain

³⁹ Commission Order, June 11, 2018, p. 6-7.

reasonable and appropriate.” As discussed previously, most parties and the Agencies agree that the scenarios remain reasonable, although MLIG believes they are needlessly complex.

In staff’s view, retaining the modeling scenarios as listed in the Commission’s June 11, 2018 Order is reasonable, and staff takes no position on whether to change them. However, staff also believes that the Statute and the Commission’s December 2007 Order would support a \$0 CO₂ cost value in years prior to the effective year.

To explain further, two of the Commission’s required modeling scenarios include applying the high and the low environmental externalities values, which is necessary in order to accurately assess the full societal impact of pollution. In other words, they appropriately ignore the regulatory costs because the purpose of these two scenarios is to internalize the negative externalities that result from carbon emissions.

The CO₂ regulatory costs were intended to do something different; the original purpose was to create a rate impact forecast in a highly uncertain political landscape, as explained below in an excerpt from the Commission’s December 2007 Order:

It is important to note what Minnesota Statutes § 216H.06 does and does not require. The statute reflects the Legislature’s conclusion that it is likely that eventually laws will govern the emission of CO₂ and that utilities and their ratepayers will need to bear these costs. The statute’s chief requirement is to compel utilities to plan accordingly. A utility’s failure to correctly forecast the magnitude of CO₂ regulation costs may result in the utility’s making choices that prove to be costly in retrospect, the same as any other forecasting error. But the forecasts themselves will neither increase nor decrease any utility’s wholesale costs or retail rates for electricity. They are simply planning tools, akin to any other forecast a utility makes.⁴⁰

Staff believes the Commission’s existing scenarios remain reasonable because (a) the Commission is not bound by a decision it made in December 2007 and (b) accounting for CO₂ regulatory costs where they exist and externalities in other years is not imprudent planning. Having said that, staff believes the \$0 cost value until the effective year would provide the most accurate forecast of likely rate impacts.

D. Effective Year

Historically, this docket has repeatedly wrestled with selecting a year when carbon regulation could occur. In this round, parties have, for the most part, coalesced around 2025. The CEOs and MLIG remain very far apart, and a few utilities initially preferred an effective year later than 2025.

Up to this point, each Commission order has chosen a single effective year, but as shown by the table below, subsequent Commission orders have often postponed the effective year:

⁴⁰ Commission order, December 21, 2007, p. 3.

Commission Order, By Year	Effective Year
2007	2012
2009	2012
2011	2012
2012	2017
2014	2019
2016	2022
2018	2025

Staff believes continuing the approach of keeping a single effective year remains reasonable, and no party has recommended otherwise; however, the Commission could consider incorporating a different price *and* year into the range.

For instance, the low end of the range could adopt a later effective year and lower cost, or \$5/ton beginning in 2030. This would be more aligned with MP's, GRE's, and Otter Tail's initial recommendations in the DI docket. Then, the high end of the range could adopt an earlier effective date with a higher cost, or \$25/ton in 2023, which would be more aligned with the midpoint of the CEOs' recommendation. And the existing, required \$0 scenario (no externality/no regulatory cost) seems to align with the MLIG position.

Staff did *not* include this approach in the decision options because it is intended to be a possible topic for discussion should the Commission wish to explore it, not a staff proposal. Also, as noted, no party suggested applying two different years. But since, in this case, there is actually more disagreement with the year than the costs, staff thought to offer for the Commission's consideration having two different effective years.

Staff notes, however, that incorporating two different effective years could have several limitations:

First, each value the Commission establishes should have a reasonable basis and align with the Statute's directive to establish an estimate of likely costs. Nearly all of the parties would probably conclude that a \$25/ton in 2023 cost value is not likely.

Second, having a single effective year has worked well in the past because parties are able to use a midpoint as a base case, and they are able to use a midpoint in dockets where one number must be used, such as avoided cost calculations. Having to select a midpoint between two different prices and two different years could be problematic.

Third, in general, simplicity has great value in modeling exercises, particularly since utilities are required to model environmental externalities in addition to regulatory costs. Solely evaluating two ends of a cost range is much more straightforward.

E. Guide to the Decision Options

The Decision Options are presented as basically a binary choice between the Agencies' recommendations and the CEOs' recommendations. Again, all parties except the CEOs either support, or do not object to, the Agencies' proposed range. (The MLIG's recommendation to delay the effective year and remove externalities from the regulatory cost scenarios are included in the Agencies Recommendations section because the MLIG supports the cost range.) The CEOs' recommendation is listed separately because the values and the effective year are both different.

Second, in the "Modeling Scenarios" section of the Staff Analysis section, staff discussed whether utilities should continue to use environmental externalities prior to the year in which the CO₂ regulatory costs begin to apply. The MLIG's comments also discuss their preference for removing environmental externalities from the regulatory cost scenarios.

If the Commission wishes to modify the regulatory cost scenarios to incorporate a \$0 cost value before the effective year, it would adopt Decision Options 2.c.i. (staff option) or 2.c.ii. (MLIG) and 2.d.i. (staff option) or 2.d.ii. (MLIG) as written on the next page.

Third, the Agencies recommend that the cost values be applied to proceedings in 2020 *and* 2021, not just 2020. As shown in Decision Option 2, this recommendation is rolled into the Agencies' recommendation on the "Modeling Scenarios"—in other words, whether to apply the values in 2020 proceedings only is not a separate decision option.

Because all parties agree with applying the values to 2020 *and* 2021 proceedings, staff chose not to change the Department's language and create separate decision options. However, if the Commission wishes to apply the values to 2020 only, it would strike the language "and 2021" from Decision Option 2.

Finally, staff chose not to include every party's final position in the parentheses after each decision option. All parties except the CEOs support the Agencies Recommendation except where noted (e.g. the MLIG positions on the effective year and modeling scenarios).

VII. Decision Options

Agencies Recommendation

(No change from the Commission's June 11, 2018 Order)

1. Quantify and establish the range of regulatory costs of carbon dioxide emissions as \$5 to \$25 per short ton effective 2025 and after. **OR**
 - a. Quantify and establish the range of regulatory costs of carbon dioxide emissions as \$5 to \$25 per short ton effective 2037 and after. *(MLIG)*
2. Require that, 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 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 CO₂ as approved by the Commission in its January 3, 2018 Order.
 - c. 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 emissions, in lieu of environmental costs. **OR**
 - i. Incorporate, for planning years after 2024, the low end of the range of regulatory costs for CO₂ emissions. *(Staff Option)*
 - ii. Incorporate, for planning years after 2036, the low end of the range of regulatory costs for CO₂ emissions. *(MLIG)*
 - 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. **OR**
 - i. Incorporate, for planning years after 2024, the high end of the range of regulatory costs for CO₂ emissions. *(Staff Option)*
 - ii. Incorporate, for planning years after 2036, the high end of the range of regulatory costs for CO₂ emissions. *(MLIG)*

- e. Consistent with the Commission's decision in the Order Updating Environmental Costs, utilities shall include at least one scenario that excludes consideration of CO₂ costs.

CEOs Recommendation

3. Set the Low regulatory CO₂ cost value as RGGI's Emissions Containment Reserve trigger price for years 2023-2030, and escalate the 2030 value at seven percent annually for years after 2030;
4. Set the High regulatory CO₂ cost value as the inflation-adjusted High case forecast from Synapse Energy Economics' Spring 2016 National Carbon Dioxide Price Forecast for the relevant planning year; and
5. Find that 2023 is the appropriate threshold year for the application of CO₂ regulatory costs.