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STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION

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Valerie Means	Commissioner
Matthew Schuerger	Commissioner
Joseph Sullivan	Commissioner
John Tuma	Commissioner

June 8, 2020

In the Matter of an Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities

Docket No. E999/CI-19-704

COMMENTS OF FRESH ENERGY

I. Introduction

Fresh Energy submits these comments in response to the Commission's May 11, 2020 *Notice of Extended Comment Period* regarding the Commission's Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities. Minnesota Power ("MP"), Xcel Energy ("Xcel"), and Otter Tail Power ("OTP") submitted *Annual Compliance Filings* in this docket on March 1, 2020.

Self-commitment and self-scheduling are options available to generators participating in the Midcontinent Independent System Operator (MISO) wholesale electricity market. The unit commitment process determines which generators will operate to meet the upcoming need while the scheduling and dispatch process determines the hourly output level for each committed resource. Under "economic" commitment and dispatch, MISO will not dispatch a resource until market prices meet or exceed the unit's production costs, subject to reliability requirements. "Self-commitment" (also commonly referred to as "must run") enables a participant to pre-determine that the unit will be committed, and self-scheduling enables a participant to unilaterally set a unit's output level regardless of economics. Self-committed units are wholesale market price-takers up to their economic minimum output level (or up to the self-scheduled level, if higher), but may be dispatched above economic minimum depending on market prices or reliability needs.

Self-commitment and self-scheduling have come under great scrutiny across the country over the past year. Several reports and evaluations of market economics have concluded that

widespread use of self-commitment suppresses market prices, unnecessarily elevates fuel costs for customers, and may displace lower-cost resources such as renewable energy generators.[1] Coal plants are the most common users of self-commitment – a recent MISO report showed that 80%-90% of coal generation was self-committed between March 2019 and March 2020. As market prices have fallen over the past decade or more,[2] the production costs of coal plants are more frequently above market price, contributing to hundreds of coal plant retirements across the country.[3] We commend the Commission for being on the vanguard of investigating these practices and facilitating a shift toward more efficient operational strategies in Minnesota.

To address this market dynamic and the fact that many self-committed coal plants operate at a loss for significant periods of time, in our September 2019 filing in Docket 18-373, Fresh Energy identified that Minnesota utilities could change the default commitment status of coal units from self-commit to economic commitment. Making this change to operations would: i) preserve the ability for coal units to qualify for resource adequacy at MISO,[4] ii) enable coal units to provide electricity when wholesale prices are high enough to justify it, iii) enable coal units to be called on for reliability services if determined they are needed by MISO,[5] and iv) avoid operating coal units at a loss when they are not needed.

Two Minnesota investor-owned utilities have already responded constructively to market dynamics and the Commission's investigation and have taken concrete action to reduce customer costs. Xcel Energy ("Xcel") has shifted two units from using self-commitment year-round to using predominantly economic commitment. At the Commission's May 21, 2020 Agenda Meeting, the Commission approved Xcel's proposal to idle Sherco 2 and the Allen S King plant during shoulder seasons while continuing to commit them economically during peak seasons.[6] Xcel has also begun to use economic commitment at Sherco 1 and is currently

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[1] Southwest Power Pool Independent Market Monitoring Unit, *Self-committing in SPP Markets*, December 2019; Fisher, Jeremy et al. *Playing with Other People's Money*, Sierra Club, October 2019; Daniel, Joe et al. *Used by How Useful*, Union of Concerned Scientists, June 2020.

[2] See for example Mills, Andrew D, et al., *Impact of Wind, Solar, and Other Factors on Wholesale Power Prices: An Historical Analysis—2008 through 2017*, Lawrence Berkeley National Lab, November 2019.

[3] *US power generators set for another big year in coal plant closures in 2020*, S&P Global, January 2020.

[4] MISO Resource Adequacy Business Practices Manual BPM-011-r23 Effective Date: March-31-2020, section 4.2.1.3 (describing the "must offer" requirement); MISO Energy and Operating Reserve Markets Business Practices Manual BPM-002-r20 Effective Date: AUG-15-2019, section 4.2.3.4.6 (describing the various qualifying offer commitment statuses).

[5] MISO Energy and Operating Reserve Markets Business Practices Manual BPM-002-r20 Effective Date: AUG-15-2019, section 6 and section 6.1.5 (describing the Reliability Assessment Commitment and Look-Ahead Commitment Activities, which "provide input into the operation of the Real-Time Energy and Operating Reserve Market to ensure that sufficient Resources are available and on-line to meet the demand and Operating Reserve requirements within the Market Footprint, as projected by MISO for each hour, or sub-hour, or sub-hour, period of the Operating Day." This process includes all committed generators and makes accommodations for "Long Start-Up Resources.")

[6] Unanimously approved Motion by Commissioner Schuerger at the May 21, 2020 Public Utilities Commission Agenda Meeting, Docket No. 19-704.

alternating economic commitment between Sherco 1 and 2. Otter Tail Power ("OTP") has been working with co-owners of the Big Stone plant over the past year to develop a plan to move to economic commitment while dispatching into both MISO and SPP. Big Stone was moved to economic commitment in April.[7]

Thanks to the action by utilities and ongoing research by advocates and market monitors, it has become clear that coal plants can move to using economic commitment and that doing so has huge cost saving potential for customers in addition to significant emissions reductions. As the Minnesota Department of Commerce stated in *Initial Comments* regarding Xcel's proposal to move King and Sherco 2 to economic commitment and seasonal idling: "Using an economic commitment strategy clearly results in lower energy costs than a must-run strategy…It is clear that the must-run commitment strategy is not reasonable."[8]

Fresh Energy's analysis of the utilities' 2020 Annual Compliance Filings supports that conclusion. Each coal unit we looked at had significant periods of losses when customers could have benefited from the unit being economically committed and dispatched. We recommend that each utility take swift action to evaluate and implement operational changes at each coal unit that is still being self-committed year-round. Now more than ever, customers should not be over-paying for electricity and Minnesota's utilities should take every possible step to minimize costs.

MP failed to comply with the Commission's previous order, as it did not evaluate the potential for moving either Boswell unit to economic commitment or to examine the costs and benefits of such a change. Nonetheless, we can see by looking at MP's filing that economic commitment would benefit customers. MP also provides several reasons for why it believes economic commitment will not work at Boswell, but none of these are a valid barrier. Therefore, we recommend that MP provide a plan for moving the Boswell units to economic commitment by September 1, 2020.

OTP and Xcel have taken positive steps to reduce customer costs and lower emissions of their coal fleet by shifting to economic commitment at one or more units. Fresh Energy's analysis found a large opportunity for cost savings at both Big Stone and Coyote from moving to economic commitment. We recommend that OTP provide additional analysis of the costs and benefits of shifting operations at Coyote, including an analysis of the costs of potential changes to the fuel contract at that unit. Fresh Energy also found that shifting to economic commitment at Sherco 3, the only Xcel coal unit that is still self-committing year-round, could generate significant customer savings. We recommend that Xcel provide an analysis of the costs and benefits of shifting operations at Sherco 3 in their next compliance filing in this docket.

[7] Otter Tail Power response to Sierra Club IR 31 (MN-Sierra-31)
[8] Minnesota Department of Commerce, *Initial Comments* filed April 1, 2020, Docket 19-809, pp.4-6.

II. Analysis of Self-Committing Coal Plants in Minnesota

A. Compliance Filings

The Commission's investigation covers the "baseload" generators of Minnesota's three investor-owned utilities. Fresh Energy focuses here on the eight coal generating units operated by these utilities: Boswell units 3 and 4 operated by MP, King and Sherco units 1-3 operated by Xcel, and Big Stone and Coyote operated by OTP. Unfortunately for Minnesota ratepayers, all eight of these units operated at a loss in 2019 when considering a plant's fuel plus O&M costs (not including its long-term capital costs recovered in base rates) compared to plant's energy market revenues. Combined, their operational losses totaled approximately $78 million in 2019.[9]

The three *Annual Compliance Filings* are significantly more robust than the reporting submitted last year in Dockets 17-492 and 18-373. Fresh Energy applauds Xcel and OTP for their work over the past year to evaluate operational changes and take concrete action to reduce costs for customers by moving to economic commitment at certain units. Minnesota Power, on the other hand, failed to even evaluate the potential costs and benefits of alternative operational strategies like moving to economic and/or seasonal commitment,[10] even though they were required to by Order Point 8 of the Commission's November 13, 2019 *Order Accepting 2017 - 2018 Electric Reports and Setting Additional Requirements* ("Order").[11]

As discussed above, Xcel and OTP have already shifted from self-commitment to economic commitment at one or more coal units, at least on a seasonal basis, and expect significant customer savings as a result.[12] This change in operational strategy is becoming best practice across the country and in Minnesota. We see no reason MP cannot do the same. Thus far, MP has failed to provide any analysis comparing economic with self-commitment and has failed to provide any reasonable basis for why an economic commitment-based strategy,[13] similar to the one being utilized by Xcel for Sherco 1 and by OTP at Big Stone, would not work for the Boswell units.

MP asserts that, "self-commitment status combined with allowing MISO to dispatch the Boswell facility economically between its minimum and maximum capability is currently the least cost

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[9] MISO energy market revenues less fuel, variable O&M, and fixed O&M costs.
[10] Minnesota Power, *Annual Compliance Filing* filed March 2, 2020 in Docket 19-704, p. 6
[11] Minnesota Public Utilities Commission, Order Accepting 2017 - 2018 Electric Reports and Setting Additional Requirements, November 13, 2019 in Docket 18-373.
[12] Xcel, *Initial Filing* filed December 19, 2019 in Docket 19-809, pp. 10-11.
[13] By "economic commitment-based strategy" Fresh Energy means an operational plan that uses economic commitment as much as possible, but may also use self-commitment strategically to minimize costs. For example, this strategy might include self-committing a unit if forecasts predict a short period of low prices followed by a period of higher prices (e.g. "commitment bridging").

strategy for Minnesota Power customers as demonstrated by the evaluation contained in this filing."[14] Yet, as MP points out, the analysis contained in their March 2 filing simply calculates net MISO energy market revenues for each hour of the period covered, and ignores clear opportunities for savings under an economic commitment-based strategy. How does MP know this is the least cost strategy without having even taken the step examine alternatives (as the Commission required)? Based on its responses to Sierra Club Information Requests 15 and 18,[15] it appears MP has not done such analysis.

MP offers several potential, but unconvincing, reasons why it cannot change Boswell to an economic commitment approach as Xcel and OTP have done: MISO resource adequacy requirements, replacement power and market risk, and reliability services. First, MP argues that, "the Boswell units are used to meet Minnesota Power resource adequacy requirements and, therefore, are required to offer the available energy for dispatch each day."[16] This argument is a red herring because the "must offer" requirement MP is referring to is fully met under economic commitment.[17] Economic commitment preserves the ability to use a generator to meet resource adequacy requirements, as evidenced by OTP's use of economic commitment at Big Stone and Xcel's use of economic commitment at Sherco 1.

MP also expresses concern about the capacity and availability of other generators in the region to meet demand if Boswell is not committed and dispatched, and the price for that energy. Again, MP conflates economic commitment with not committing the unit at all, such as with seasonal idling. Transitioning to economic commitment makes the Boswell units fully available to MISO. Minnesota participates in the MISO market, which dispatches the least-cost generation from the region to meet full regional demand. It is not reasonable to assert that power would be unavailable, overly expensive, or transmission constrained without very specific reasons as to why the Boswell units are electrically different from all of the other generators in Minnesota and the region that are able to utilize economic commitment. Further, if Boswell is committed economically it will be fully available to be called upon during times when its costs are below market prices. This availability means that Boswell would be available to generate power when wholesale prices are high, and therefore, that price exposure risk to MP customers from a change to economic commitment is minimal.

Lastly, MP raises the question of reliability services. As with MP's arguments about resource adequacy and market prices, MP's reliability argument is simply not applicable to the

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[14] Minnesota Power, *Annual Compliance Filing* filed March 2, 2020 in Docket 19-704, p. 5.
[15] Minnesota Power Response to Sierra Club IRs 15 and 18.
[16] Minnesota Power, *Annual Compliance Filing* filed March 2, 2020 in Docket 19-704, p. 5.
[17] MISO Resource Adequacy Business Practices Manual BPM-011-r23 Effective Date: March-31-2020, section 4.2.1.3 (describing the "must offer" requirement); MISO Energy and Operating Reserve Markets Business Practices Manual BPM-002-r20 Effective Date: AUG-15-2019, section 4.2.3.4.6 (describing the various qualifying offer commitment statuses).

discussion around to a change from self-commitment to economic commitment. Under an economic commitment status, the Boswell units remain available and will be dispatched by MISO if any reliability issues emerge.[18]

Therefore, none of the reasons that MP provides for not using economic commitment are true barriers. In light of the work done in this proceeding and the examples set by MP's peer utilities, it is clear that economic commitment of coal plants that have historically self-committed year-round is both viable and cost-saving. As such, we recommend that in Reply Comments, MP provide a plan for moving the Boswell units to an economic commitment-based strategy by September 1, 2020 to ensure that customers are not over-paying for Boswell operation this coming fall. Now more than ever, customers should not be over-paying for electricity and MP should take every possible step to minimize costs.

B. Analysis of Plant Net Revenue Information

Each utility calculated the annual net energy market revenue (or "cost/benefit") of their units when including variable fuel and O&M costs, and using the definitions of variable O&M used in their MISO offer curves, with slightly different approaches. Xcel also included net energy market revenue when subtracting total production costs, including start-up costs in the hour they were incurred. OTP's analysis using variable fuel costs only is consistent with the Commission's Order but leaves out approximately half of Coyote Station's fuel costs because the coal contract for Coyote includes a large fixed amount. Fresh Energy's evaluation included all fuel costs for Coyote[19] (as for all units) because fixed fuel costs are recovered through the fuel charge adjustment and are thus essential for understanding true costs to customer.[20]

Before analyzing the utilities' coal plant revenue information, it is worth noting that the net revenue numbers presented by the utilities in their compliance filings utilize a very conservative categorization of costs as variable or fixed, categorizing as few costs as "variable" as possible. Generally, variable costs are those that vary with generation output, while fixed costs are independent of output. However, the categorization of fixed versus variable costs is not an exact science, and one can debate where it is appropriate to draw the line. In this case,

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[18]MISO Energy and Operating Reserve Markets Business Practices Manual BPM-002-r20 Effective Date: AUG-15-2019, section 6 and section 6.1.5 (describing the Reliability Assessment Commitment and Look-Ahead Commitment Activities, which "provide input into the operation of the Real-Time Energy and Operating Reserve Market to ensure that sufficient Resources are available and on-line to meet the demand and Operating Reserve requirements within the Market Footprint, as projected by MISO for each hour, or sub-hour, or sub-hour, period of the Operating Day." This process includes all committed generators and makes accommodations for "Long Start-Up Resources.")

[19] Fresh Energy calculated an average cost per MWh for the fixed portion of fuel at Coyote by applying the fixed ratio provided by OTP in Response to Fresh Energy IR 1 (46.6%), to total fuel cost divided by net generation for 2018 and 2019.

[20] Fresh Energy's analysis did not also consider total production costs as presented by Xcel

the utilities are classifying as few costs as variable as possible because the net revenue analysis called for here looks only at variable costs. Therefore, the fewer plant operational costs that are classified as variable, the better a plant's net revenue (revenues minus variable costs) will look. In addition, the Commission's order asked for costs as submitted in MISO offer curves, where utilities also have an incentive to minimize the operational costs classified as variable.

The utilities' variable costs as filed include only fuel and fuel transportation, variable water supply, ash handling, and pollution control reagents. However, some of the costs being categorized as fixed would be reduced at lower levels of generation. For example, non-fuel expenses within FERC Account 501 include labor, travel, materials, and contracts to support fuel handling, would reasonably vary with the amount of fuel consumed at the unit, but are categorized as fixed in this analysis.[21] Similarly, labor, supplies, and other expenses in FERC Accounts 502 (Steam Expenses), 505 (Electric Expenses), and several maintenance-related accounts could reasonably vary with generation output. These cost classifications are not necessarily incorrect, but there are many more plant costs that the utilities' analysis categorize as "fixed" that could reasonably be considered variable and would be avoidable when a plant is not running. Therefore, a more reasonable classification of variable operational costs would result in plant net revenues with even more losses than those shown in the analysis provided by the utilities.

Nonetheless, we analyzed the utilities' net revenue calculations with the operational cost classifications provided by the utilities. Even then, it is evident that there are significant benefits of shifting to an economic commitment-based operational strategy.

i. Findings: Minnesota Power

Fresh Energy evaluated Minnesota Power's *Compliance Filing* and found several significant periods of losses at both units. Both Boswell units had significant net losses in 2019, and operated at a loss in [TS] [redacted] [TS] months of the year, when looking at both fixed and variable O&M costs. On a variable basis, even using MP's categorization of variable costs, Boswell 3 had [TS] [redacted] [TS] months with negative or extremely low revenue, and Boswell 4 had [TS] [redacted] [TS] months with negative or extremely low revenue in 2019. See Appendix 1A for more information illustrating monthly net revenue for each unit in 2019.

These findings are consistent with Fresh Energy's analysis of MP's previous compliance filing covering July 2016-June 2018. Over that two-year period, Boswell 3 had [TS] [redacted] [TS] months with losses on a variable basis and had extremely low revenues in an additional [TS] [redacted] [TS] months. Boswell 4 had [TS] [redacted] [TS] months with losses on a variable basis.[22]

[21] See: OTP Response to Fresh Energy IR 1-Attachement 1, Xcel Response to Fresh Energy IR 1, and MP Response to Fresh Energy IR 2- Attachment A (Docket 19-704).
[22] Fresh Energy, *Comments* filed September 24, 2019 in Docket 18-373, p. 16.

We also found many times throughout this 18 month reporting period (July 2018-December 2019) when it is likely that customers would have directly benefited if the plant had not run, e.g. when customers would have saved money if MP had used economic commitment:

- From July 2018 through December 2019, there were 26 periods when Boswell 3 sustained losses for two or more days in a row, and 33 such periods at Boswell 4.
- Combined, these 59 periods cost customers $2,733,150. The graph below illustrates the length and losses sustained during these periods at Boswell 4.

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Our evaluation uses the variable cost categorization MP provided, though for reference we present the same data in Appendix 1A using an alternative classification of variable costs.

ii. Findings: Otter Tail Power

Fresh Energy's analysis of OTP's *Compliance Filing* similarly shows several long periods of losses and indicates that customers are likely to benefit significantly from changing operations at Big Stone and Coyote. In 2019, Big Stone had [TS] [redacted] [TS] months with net losses and [TS] [redacted] [TS] additional months with extremely low revenue.[23] This is consistent with Fresh Energy's findings from OTP's previous Compliance Filing, which showed that Big Stone had losses on a

[23] See Appendix 1B for graphs illustrating Big Stone and Coyote net revenues.

variable basis in [TS] [redacted] [TS] months over the two fiscal years examined (July 2016-June 2018).[24]

Moving Big Stone to economic commitment and dispatch in low-priced seasons is an economically efficient choice that will help to minimize costs borne by OTP's customers. We applaud OTP for identifying a solution for shifting to economic commitment at Big Stone that works across the three co-owners and for implementing this solution in a timely manner.

Looking at the Coyote plant, in 2019 there was only [TS] [redacted] [TS] with meaningful positive revenue when including all fuel costs. Even when ignoring half of Coyote's fuel costs (as OTP proposes), in 2019 the plant still had [TS] [redacted] [TS] of losses and [TS] [redacted] [TS] months with extremely low revenue. In our September 2019 filing looking at OTP's previous Compliance Filing on this topic, we found that Coyote had losses on a variable basis (when including all fuel costs) in [TS] [redacted] [TS] months over the two fiscal years examined (July 2016-June 2018).[25]

We understand that Coyote's co-owners see the fixed portion of the Coyote Creek Mine contract as a barrier to moving toward economic commitment. Still, OTP customers are paying for the [TS] [redacted] [TS] months in 2019 when Coyote had significant production losses, regardless of whether the coal contract is fixed or not. As such, we recommend that the Commission require OTP to file a compliance filing presenting an analysis of shifting to an economic commitment-based strategy at Coyote with the current coal contract, discussing the options and the costs of changing the contract, and evaluating how those costs compare to Coyote's 2019-2020 and likely future operating losses.

iii. Findings: Xcel Energy

Fresh Energy similarly evaluated the net revenue analysis Xcel presented in their *Compliance Filing*. In addition, Xcel provided the results of PLEXOS modeling showing the system-wide impacts of moving King and Sherco 2 to economic commitment, and then to seasonal idling, in a separate filing on December 20, 2019.[26] This analysis indicates that the overall impact of moving from must-run year round to economic commitment and seasonal idling (after accounting for the cost of any additional purchased energy) would be $90-130 million in savings for Xcel customers from 2020-2028. Xcel began using an economic commitment-based strategy at King and one Sherco unit in July 2019. Thus far, Xcel has been alternating economic commitments at Sherco units 1 and 2. Fresh Energy applauds Xcel for working to identify, propose, and implement these operational changes in a relatively short time.

[24] Fresh Energy, *Comments* filed September 24, 2019 in Docket 18-373, p. 13.
[25] *Ibid*.
[26] Xcel, *Initial Filing* filed December 20, 2019 in Docket 19-809.

Sherco 3 is the only Xcel coal unit still using primarily self-commitment. On a variable basis, Sherco 3 lost money in [TS] [TS] months of 2019 and had extremely low revenues in an additional [TS] [TS] months, as you can see from the graph below.

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Xcel states that their ability to use economic commitment is limited at Sherco 3 by their joint operating agreement with Southern Minnesota Municipal Power Agency (SMMPA).[27] However, OTP and the two other co-owners of Big Stone have demonstrated that it is feasible to coordinate economic commitment and dispatch across multiple operators. Given that there appears to be opportunity for savings at Sherco 3 using an economic commitment-based strategy, Fresh Energy recommends that Xcel work with SMMPA to evaluate the cost impacts of this shift and to identify a solution for coordinating commitment and dispatch decisions.

C. Conclusion

It is clear that moving coal units to economic commitment whenever possible is advantageous for customers and that continuing to operate using self-commitment year-round as status quo is no longer reasonable. Economic commitment preserves the ability to use a unit's capacity to meet resource adequacy requirements, the availability of a unit for MISO for reliability needs, the ability to come online when prices are higher to protect customers, and avoids the risk of massive losses that can arise when, like we saw in 2019, there are long periods of low market prices.

[27] Xcel, *Annual Compliance Filing* February 28, 2020 in Docket 19-704, p. 5.

Fresh Energy commends Xcel and OTP for their work to find solutions at one or more units that lower costs for customers, as well as significantly reduce emissions. We encourage both utilities to continue working toward using an economic commitment-based strategy at all coal units.

Thus far, MP has failed to provide any analysis comparing economic with must run commitment or to provide any reasonable basis for why an economic commitment-based strategy would not work for Boswell. Therefore, Fresh Energy recommends that MP provide in Reply Comments a plan for moving one or more Boswell units to an economic commitment-based strategy by September 1, 2020.

III. Refinements to Future Annual Reporting

In addition to our recommendations on operational changes, we recommend one update to the compliance reporting requirements. Xcel's and OTP's filings illustrate issues with the way costs are defined in the November 13, 2019 Order. OTP included only variable fuel costs in their analysis, which left out approximately half of fuel costs at Coyote. Xcel provides two analyses, one using variable costs as required by the Order and one using full production costs, including start-up costs in the hour in which they are incurred. Fresh Energy believes the analysis should look at actual production costs incurred at the units wherever possible, and therefore recommends some minor adjustments to Order Point 9 from the November 13, 2019 order, below.

> *Recommended Change to Order Point 9:*
> The Commission will open an investigation in a separate docket and require Minnesota Power, Otter Tail, and Xcel to report their future self-commitment and self-scheduling analyses using a consistent methodology by including all production costs including fuel, ~~cost~~ variable O&M ~~costs, matching the offer curve submitted to MISO energy markets~~, and any other variable costs associated with the plant.

IV. Summary of Recommendations:

1. Minnesota Power should provide a plan in this docket for moving one or more Boswell units to an economic commitment-based strategy by September 1, 2020.

In addition, we recommend that the Commission order:

2. In subsequent compliance filings, require Otter Tail to provide: a) an analysis of shifting to an economic commitment-based strategy at Coyote Station with the current coal contract, b) a discussion of the options and the costs of changing the Coyote Station contract, and c) an evaluation of how potential costs of changing the contract compare to Coyote's past and forecast operating losses.

3. In subsequent compliance filings, require Xcel to evaluate the financial costs and benefits of moving Sherco 3 to economic commitment.

4. Update Order Point 9 of the Commission's November 13, 2019 *Order* to read:

   The Commission will open an investigation in a separate docket and require Minnesota Power, Otter Tail, and Xcel to report their future self-commitment and self-scheduling analyses using a consistent methodology by including all production costs including fuel, ~~cost~~ variable O&M ~~costs, matching the offer curve submitted to MISO energy markets~~, and any other variable costs associated with the plant.

Thank you for the opportunity to comment on this important matter.

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APPENDIX 1A:
ADDITIONAL ANALYSIS FOR MINNESOTA POWER

The graphs below illustrate the monthly net revenue for each Boswell Unit in 2019. Fresh Energy compared monthly net revenue when looking only at variable costs and when including fixed O&M costs. As you can see, Boswell 3 had [TS] [redacted] [TS] months with negative or extremely low revenue and Boswell 4 had [TS] [redacted] [TS] months with negative or extremely low revenue in 2019, on a variable basis. When including fixed monthly O&M costs, both units show losses in [TS] [redacted] [TS] months and extremely low revenues in an additional [TS] [redacted] [TS] months.

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As discussed on page 6 of Fresh Energy's Comments, the net revenue numbers presented by the utilities in their compliance filings utilize a very conservative categorization of costs as variable or fixed, categorizing as few costs as "variable" as possible. Below we provide an analysis of Boswell units 3 and 4 using an alternate categorization of variable vs. fixed costs to illustrate how cost categorization can impact the analysis.

In response to Fresh Energy IR 2, MP stated that the only operational cost categories that include variable costs are fuel and the environmental/ash system (FERC Accounts 501, 502.1 and 512.10).[28] However it is reasonable that some additional costs would vary with output and would be reduced if the plant were not running year-round, as it currently is. In the analysis below, we present the same net revenue analysis provided in Comments but using alternative variable costs drawn from specific cost categories of MP's 2019 FERC Form 1. For this alternative, Fresh Energy categorized all expenses within FERC Accounts 501 (Fuel), 502 (Steam Expenses), and 505 (Electric Expenses) as variable. We also categorized 33% of expenses within the Maintenance of Structures, Boiler, Electric Plant, and Misc Steam Plant Accounts as variable to reflect that some maintenance costs (including of ash handling and environmental systems) would be reduced at lower levels of generation.

The table below shows how Fresh Energy classified FERC Form 1 costs as variable or fixed in this alternative analysis.

FERC Form 1	**Boswell**	**Alternate Classification: % variable**
Net Generation, Exclusive of Plant Use - MWh	4,160,011	
Production Expenses: Oper, Supv, & Engr	$3,780,055	0%
Fuel	$92,619,505	100%
Steam Expenses	$5,748,423	100%
Electric Expenses	$1,281,401	100%
Misc Steam (or Nuclear) Power Expenses	$141,740	100%
Maintenance Supervision and Engineering	$2,200,555	0%
Maintenance of Structures	$647,275	33%
Maintenance of Boiler (or reactor) Plant	$7,703,551	33%
Maintenance of Electric Plant	$2,020,516	33%
Maintenance of Misc Steam (or Nuclear) Plant	$2,484,488	33%
Total Production Expenses	$118,627,509	

As the graphs below show, the way variable and fixed costs are delineated considerably changes the net revenue for both Boswell units.

[28] MP Response to Fresh Energy IR 2, Attachment.

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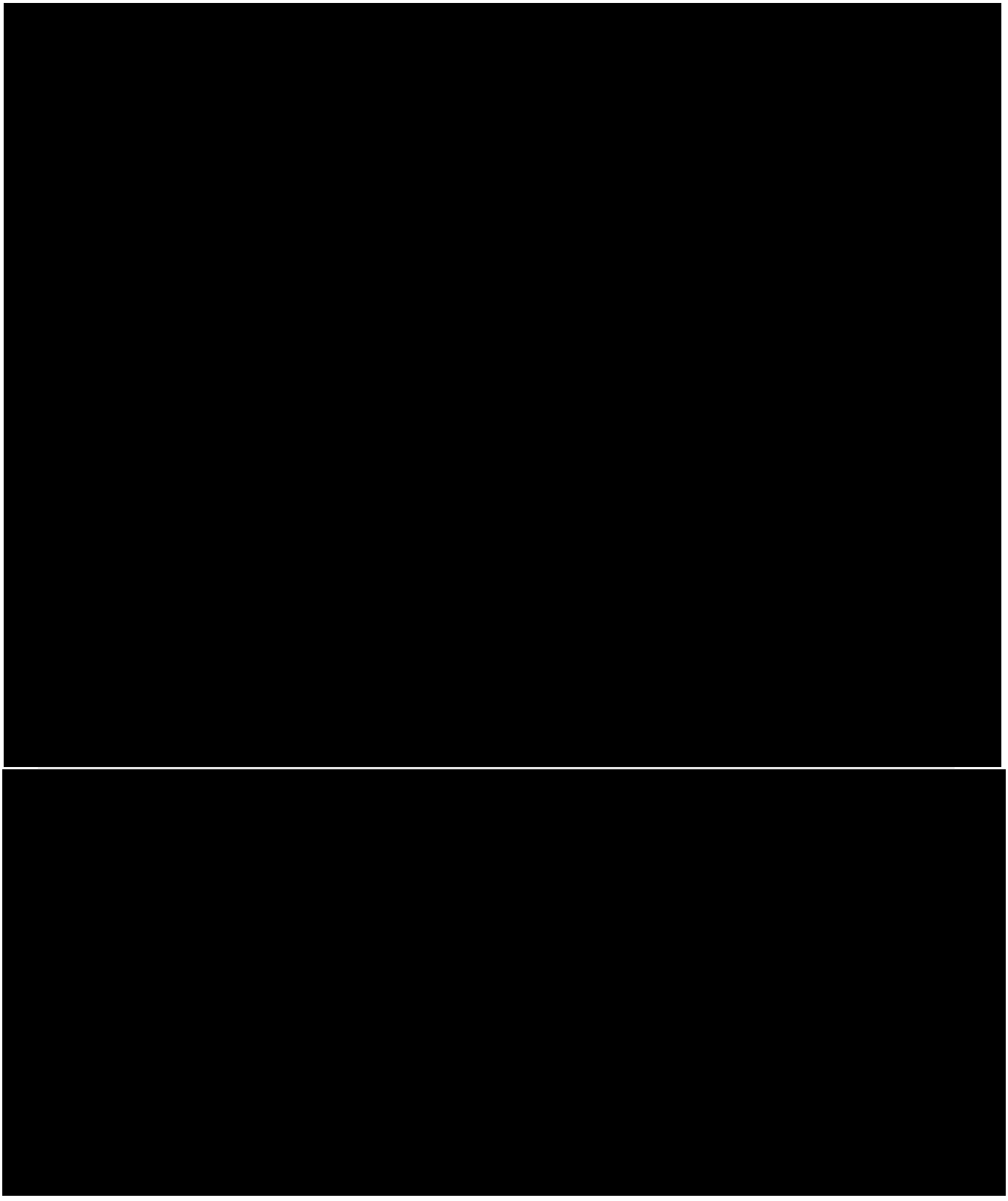

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As the graphs show, reasonably including more operational costs as "variable" changes the net revenue picture significantly. For example, for Boswell Unit 4, it shows [TS] [redacted] [TS] additional months with net losses, compared to MP's analysis. We include this analysis to demonstrate that savings from a change to economic commitment may be significantly larger than is apparent in MP's calculations.

APPENDIX 1B:
ADDITIONAL ANALYSIS FOR OTTER TAIL POWER

As discussed in Fresh Energy's Comments, the data provided by OTP for Big Stone shows that the plant had [TS] [redacted] [TS] months with net losses on a variable basis in 2019, and an additional [TS] [redacted] [TS] months with very low revenues. When including all fuel costs (and variable O&M) for Coyote, the plant sustained losses in [TS] [redacted] [TS] months of the year and had low or zero revenues [TS] [redacted] [TS] other months.

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APPENDIX 1C:

2019 REVENUES AFTER FIXED O&M COST

The tables below show the net MISO energy market revenue for each unit, less total variable costs, and less total variable and fixed costs for calendar year 2019.

Annual Net Revenue - Minnesota Power		
	2019	
	Variable Costs	Fixed Costs
Boswell 3	$6,513,028	-$6,783,951
Boswell 4	$8,525,731	-$53,757

Annual Net Revenue - Otter Tail Power		
	2019	
	Variable Costs*	Fixed Costs
Big Stone	$3,808,842	-$6,087,237
Coyote	-$5,554,157	-$24,605,647

* Including all fuel costs for Coyote

Annual Net Revenue - Xcel		
	2019	
	Variable Costs	Fixed Costs
King	-$1,194,008	-$18,040,392
Sherco 1	$5,546,471	-$12,214,636
Sherco 2	$7,493,461	-$9,459,901
Sherco 3	$4,254,767	-$15,351,247