

**STATE OF MINNESOTA
PUBLIC UTILITIES COMMISSION**

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September 24, 2019

**In the Matter of the Review of the Fiscal Year 2017
and 2018 Annual Automatic Adjustment Reports for
Electric Utilities**

**Docket Nos. E999/AA-17-492
and E999/AA-18-373**

COMMENTS OF FRESH ENERGY

Fresh Energy submits these comments in response to Otter Tail Power's (Otter Tail) May 8, 2019 *Compliance Filing* regarding the practice of self-commitment and self-scheduling.¹ On February 7, 2019, the Public Utilities Commission (the Commission) issued an *Order Accepting 2016-2017 Reports and Setting Additional Requirements* (Order).² Otter Tail filed a *Compliance Filing* (filing) responding to this matter on May 8, 2019. Fresh Energy reviewed Otter Tail's filing and filed Information Requests (IRs) on June 14 and September 3 to gather additional relevant data.

Fresh Energy appreciates the Commission's inquiry into Minnesota utilities' use of self-commitment and self-scheduling for their electricity generating units. These features of our wholesale power market have broad implications for affordability and the transition to carbon-free electricity as well as the potential to increase costs to customers today. Importantly, this proceeding is the first extensive study of self-commitment and self-scheduling by a state public utilities commission in our region. We respectfully submit these comments to the Commission presenting findings from our investigation of this issue based on Otter Tail's initial compliance filing and recommendations for future filings concerning self-scheduling and self-commitment of electric generating units.

Fresh Energy recognizes that over four months have passed since the compliance filing date and apologizes that we were unable to submit these findings earlier. Responses and evaluation

¹ Otter Tail Power, *Compliance Filing*, May 8, 2019, Dockets E999/AA-17-492 and E999/AA-18-373 ([link](#)).

² Commission, *Order*, February 7, 2019, Dockets E999/AA-17-492 and E999/AA-18-373, page 5 ([link](#)).

of the responses to our Information Requests have proceeded more slowly than usual. Given the volume of information requested and newness of this compliance reporting component, we hope this delay is understandable.

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I. Background

Self-commitment and self-scheduling are “commitment” and “dispatch” statuses available to electricity generators participating in the Midcontinent Independent System Operator (MISO) Day Ahead wholesale power market. As the Commission’s February 7, 2019 Order states under Section III Cost of Self-Commitment and Self-Scheduling:

MISO markets identify the supply of electric generation available throughout the MISO regions, and the anticipated (and, in real time, the actual) demand for electricity in each area, selecting generators for dispatch in a manner designed to minimize overall costs to the system while meeting reliability requirements. MISO unit commitment is the process that determines which generators (and other resources) will operate to meet the upcoming need. MISO scheduling and dispatch sets the hourly output for each committed resource, using simultaneously co-optimized Security Constrained Unit Commitment and Security Constrained Economic Dispatch to clear and dispatch the energy and reserve markets. A market participant—that is, anyone registered for participation in MISO markets—can specify the production cost of its generator, and MISO will refrain from dispatching the resource until market prices meet or exceed that level, again, subject to reliability requirements. But under some circumstances a participant will prefer to commit its generator to be available for MISO dispatch (“self-commit”), and unilaterally set the generator’s output level (“self-schedule”), accepting whatever market price results rather than awaiting economic dispatch by MISO.

Renewable sources of generation have the advantage of incurring no fuel costs, which tends to reduce their operating costs and make them attractive options for MISO dispatch. However, self-committed and self-scheduled generators may displace these resources—even if, at any given moment, the renewable resource had lower operating costs.³

Self-commitment enables a participant to request that MISO commit a particular unit regardless of market price.⁴ In the MISO tool set, self-commitment is “must run” status. Unless there is a reliability concern, MISO will commit the unit to at least that unit’s specified minimum output level (often referred to as “economic minimum”). In this situation, the unit is a price taker and revenues from selling into the market may be below the unit’s cost to generate. Depending on market pricing and reliability needs, MISO may also clear the unit above economic minimum.

³ Commission, *Order*, February 7, 2019, Dockets E999/AA-17-492 and E999/AA-18-373, page 4 ([link](#)).

⁴ See MISO Energy and Operating Reserve Markets Business Practices Manual BPM-002-r19 Effective Date: OCT-15-2018, section 4.2.3.4.6 ([link](#)).

Self-scheduling enables participants to submit an hourly generation schedule to MISO.⁵ Self-scheduling does not guarantee dispatch but pre-determines the minimum output level. Units are price takers up to the self-scheduled amount but may be dispatched at a higher level, up to the unit's economic maximum, if market pricing or reliability supports it. Many MISO participants using self-commitment will also use self-scheduling to ensure the unit is dispatched at least at economic minimum.⁶

For example, a 500 MW coal unit may designate 400 MW as its “economic minimum.” If that unit self-schedules for the next day, it would be a price-taker for 400 MW and it would provide an offer price for the remaining 100 MW. In that case, MISO could dispatch the remaining 100 MW if that generation cost is economic. However, that unit's costs for the self-scheduled, or “must run,” 400 MW may often exceed market revenues, resulting in a net loss.

In these comments, we present findings from our investigation of this issue based on Otter Tail's compliance filing and recommendations for future filings concerning self-scheduling and self-commitment. Section II concerns the data and analysis presented in Otter Tail's May 8, 2019 filing and Section III concerns our material findings on the costs and benefits of Otter Tail's use of self-commitment and self-scheduling.

II. Compliance Filing Methodology

The Commission's February 7, 2019 Order asked Minnesota Power, Otter Tail Power, and Xcel to “make compliance filings containing an initial analysis of the consequences of self-commitment and self-scheduling of their generators, including the annual difference between production costs and corresponding prevailing market prices for both FYE17 and FYE18.”⁷ All three utilities calculated this difference by taking net MISO revenues from the Day Ahead and Real Time (DART) markets by hour and subtracting production costs by hour, for relevant hours. However, it appears that the utilities did not agree on which hours of the year are relevant for this analysis and may have used different definitions of “production cost.”

a. Hours included in the analysis

Minnesota Power, Otter Tail, and Xcel each used a different subset of hours to calculate the difference between revenues and costs for self-committed and self-scheduled plants. Minnesota Power focused on hours where a unit was cleared in the day ahead market at

⁵ See MISO Energy and Operating Reserve Markets Business Practices Manual BPM-002-r19 Effective Date: OCT-15-2018, Section 4.2.3.4.7 ([link](#)).

⁶ Participants may also self-commit a unit and self-schedule its output to test unit performance, perform maintenance, and/or accommodate fuel, steam, or operational contract requirements.

⁷ Commission, *Order*, February 7, 2019, Dockets E999/AA-17-492 and E999/AA-18-373, Order Point 4 ([link](#)).

exactly the dispatch minimum set by the utility for that hour (e.g. the self-scheduled level). In their May 8 Filing, Minnesota Power says:

The analysis evaluated only the hours in each year where the unit was committed to its minimum value and compares the cost to operate at the Day Ahead Dispatch Minimums versus the payments Minnesota Power received from the MISO market during these same periods. If the culmination of the times MISO utilized the Boswell unit only at its minimum operating parameter created value for the customer then the self-commit strategy is beneficial for the customer.⁸

These hours are not necessarily the only hours the unit was committed as “must run” or dispatched using a self-schedule, but they are the hours when must run status is “forcing” the market to take the unit’s self-scheduled level of generation. In other words, if market conditions supported dispatch for an economic or reliability reason, in almost all cases we would expect the unit to be dispatched at a level above the self-scheduled minimum.

Xcel states in their compliance filing that they excluded refused derived fuel units from the analysis, and excluded hours when self-commitment was used for testing, maintenance, or contract requirements:

In evaluating instances of self-commit of these units, we also excluded hours when Xcel Energy’s self-commit action in the MISO market was unavoidable (e.g., mandatory generating resource testing, fuel and steam offtake contract requirements, and generating resource maintenance outages).⁹

Otter Tail included all hours of the year in the cost-benefit analysis for Big Stone and Coyote and included all hours for the months in which Hoot Lake was self-committed and self-scheduled. Hoot Lake is only self-scheduled during winter months when one of the units must be committed in order to heat the plant.

b. Costs included in the analysis

As mentioned above, all three utilities calculated the difference in production costs and market pricing by taking net MISO revenues from the Day Ahead and Real Time (DART) markets by hour and subtracting production costs by hour, for relevant hours. To our knowledge, all three utilities used fuel cost, exclusive of other variable costs, to calculate production cost.

⁸ Minnesota Power, *Compliance Filing and Attachment 1*, May 8, 2019, Dockets E999/AA-17-492 and E999/AA-18-373, page 4 ([link](#)).

⁹ Xcel, *Compliance Filing–Self Commitment*, May 8, 2019, Dockets E999/AA-17-492 and E999/AA-18-373, page 2 ([link](#)).

Otter Tail's filing states: "This analysis compares the market energy revenues received for the time frames the units were self-committed or self-scheduled vs. the fuel costs of each unit" and "the cost of reagents is not included in this analysis because those costs are not currently eligible for fuel clause recovery. Those costs are recovered in base rates."¹⁰ Thus, we understand that Otter Tail's analysis includes only fuel costs eligible for recovery through the fuel clause. Xcel's filing says it uses "As-Offered Production Cost."¹¹ We did not seek further clarification of this in IRs but based on our analysis of Xcel's May 8 filing and subsequent IR responses, their calculation appears to include only fuel cost. In response to Fresh Energy IR 1 at Part B(a), Minnesota Power clarified that the unit cost provided in their May 8 filing was fuel cost defined as "average cost of inventory on hand for the generating station,"¹² rather than delivered fuel cost.

c. Data included in compliance filings

The data and supporting calculations provided in the compliance filings submitted by Minnesota Power, Otter Tail, and Xcel vary significantly. Otter Tail's filing included a monthly summary of fuel cost, DART revenue, and the difference, for each unit and fiscal year. In contrast, Minnesota Power's filing included hourly data on cost, revenue, and market participation for its two units that utilize self-commitment and self-scheduling, Boswell 3 and Boswell 4. Data of this granularity is essential for conducting any analysis of unit commitment practices and was incredibly helpful to furthering our understanding of how self-commitment and self-scheduling of Boswell 3 and 4 works in practice over the course of a year.

Specifically, Attachment 1 of Minnesota Power's filing¹³ included the following information by unit, for each hour of each fiscal year. Some of these data points are protected data and thus were submitted under the Trade Secret designation.

- a) Date and hour
- b) Cleared MW
- c) Day ahead locational marginal price at unit node
- d) Real time adjustment
- e) Real time locational marginal price at unit node
- f) Day ahead dispatch minimum
- g) Real time dispatch minimum
- h) Unit cost (e.g. fuel cost)

¹⁰ Otter Tail Power, *Compliance Filing*, May 8, 2019, Dockets E999/AA-17-492 and E999/AA-18-373, page 3 ([link](#)).

¹¹ Xcel, *Compliance Filing*, May 8, 2019, Dockets E999/AA-17-492 and E999/AA-18-373, Attachment A ([link](#)).

¹² Minnesota Power, *Response To Fresh Energy IR 1*, July 19, 2019, Docket E999/AA-17-492 and E999/AA-18-373, page 2 ([link](#)).

¹³ Minnesota Power, *Compliance Filing and Attachment 1*, May 8, 2019, Dockets E999/AA-17-492 and E999/AA-18-373 ([link](#)).

- i) Day ahead locational marginal price at MP.MP
- j) Real time locational marginal price at MP.MP
- k) Whether Day Ahead Cleared = Day Ahead Dispatch Minimum (e.g. $B = F$) (0 or 1)
- l) Actual production in MWh (only supplied for hours when $B = F$)
- m) Day ahead MISO payment
- n) Real time MISO payment
- o) Net MISO payment ($M + N$)
- p) Production costs ($L * H$)
- q) Net cost or benefit ($O - P$)

Through Fresh Energy IR 1, we requested these same data points from Otter Tail for each unit. We also requested several additional data points:

- Ancillary service revenue
- Make whole payments revenue
- Variable operations and maintenance costs
- Fixed operations and maintenance costs
- Capital revenue requirements
- Average heat rate at economic minimum
- Average heat rate at economic maximum

Otter Tail declined to provide capital revenue requirements. The remaining information supplied through these IRs provided important context and significantly advanced our understanding of how self-scheduling and self-commitment fit into the overall performance of these generating units.

III. Findings: Otter Tail

Fresh Energy evaluated the data provided in compliance filings and subsequent IRs by all three utilities. These comments discuss our findings related to Otter Tail's filing. We acknowledge that some of these findings are preliminary and may change after clarification from the utility.

a. Frequency of self-scheduling

Otter Tail uses self-commitment and self-scheduling for three units, Big Stone Plant, Coyote Station, and Hoot Lake Plant. Big Stone is a 438.7 MW coal generating unit in Big Stone City, SD, of which Otter Tail own 53.9%. Coyote Station is a 427 MW coal generating unit in Beulah, ND, of which Otter Tail owns 35%. Hoot Lake has two units totaling 141 MW, of which Otter Tail owns 100%. Big Stone and Coyote are offered as "must run" (self-committed) and self-scheduled at minimum output at all times of the year the units are available. It is Fresh Energy's understanding that the units are not self-scheduled at economic minimum, but

unit (or emergency minimum). Year-round self-commitment and self-scheduling is due in part to joint ownership arrangements and the fact that one of the joint owners of both units participates in SPP rather than MISO.

Otter Tail uses self-commitment and self-scheduling for Hoot Lake only during winter months when one of the units must be committed in order to heat the plant. The other unit is offered on an economic basis during this time. During the remainder of the year, both Hoot Lake units are offered on an economic basis. Both Hoot Lake units are scheduled for retirement in spring 2021. For this reason, we focus on Big Stone and Coyote in the remainder of this comment.

b. Hours when cost exceeded revenue

Public Utilities Commission Information Request 2 (PUC IR 2) requested that Otter Tail provide data on the number of hours each generating unit's costs exceeded revenues for each of the 12 months during FYE17 and FYE18. The tables below show Otter Tail's response to PUC IR 2, with columns added for the percentage of hours each month that cost exceeded revenue. Our understanding is that "unit cost" in this calculation, and in the whole of Otter Tail's filing, is fuel cost fuel costs eligible for recovery through the fuel clause. As we examine in the next section, this is the narrowest definition of "cost" to use in a net revenue analysis.

On an annual basis, Big Stone's fuel costs exceeded revenues 45%-56% of hours and Coyote's fuel costs exceeded revenues 48%-60% of hours. As shown in the tables below, fuel cost exceeded revenue for both plants at least half the time in all but 3 months in FYE17 and for all but 7 months in FYE18. Months where cost exceeded revenue at least 50% of hours are shaded in Charts A and B below.

Chart A: OTP Hours Cost Exceeded Revenue in FYE17

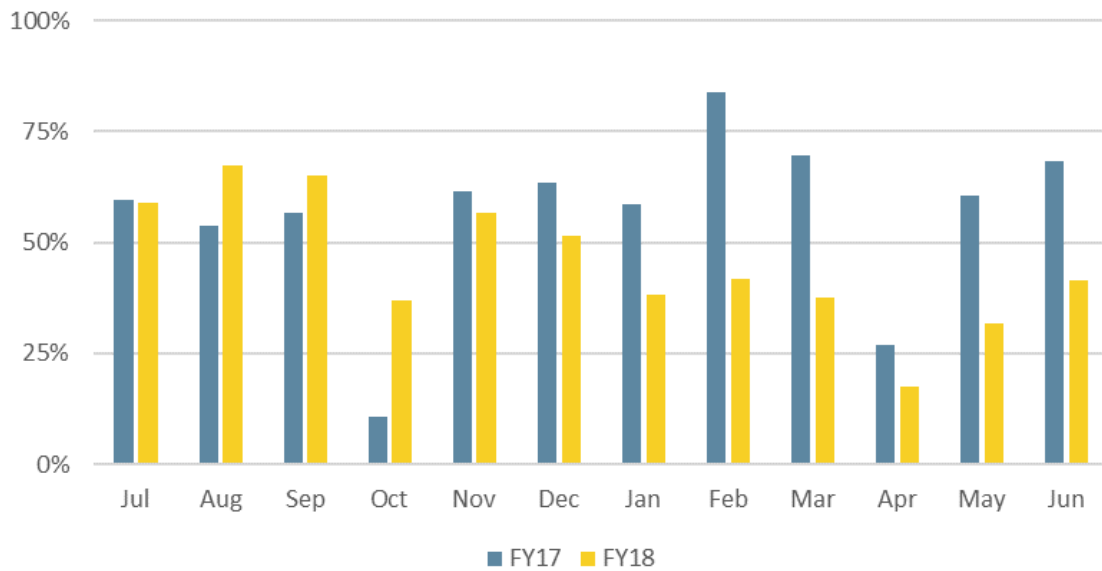
Month	Total Hours in Month	Big Stone	Coyote	Big Stone % of hours	Coyote % of hours
Jul	744	444	456	60%	61%
Aug	744	399	261	54%	35%
Sep	720	408	481	57%	67%
Oct	744	80	528	11%	71%
Nov	720	443	564	62%	78%
Dec	744	472	425	63%	57%
Jan	744	437	369	59%	50%
Feb	672	564	438	84%	65%
Mar	744	518	386	70%	52%
Apr	720	194	471	27%	65%
May	744	450	436	60%	59%
Jun	720	492	437	68%	61%
Total	8760	4901	5252	56%	60%

Chart B: OTP Hours Cost Exceeded Revenue in FYE18

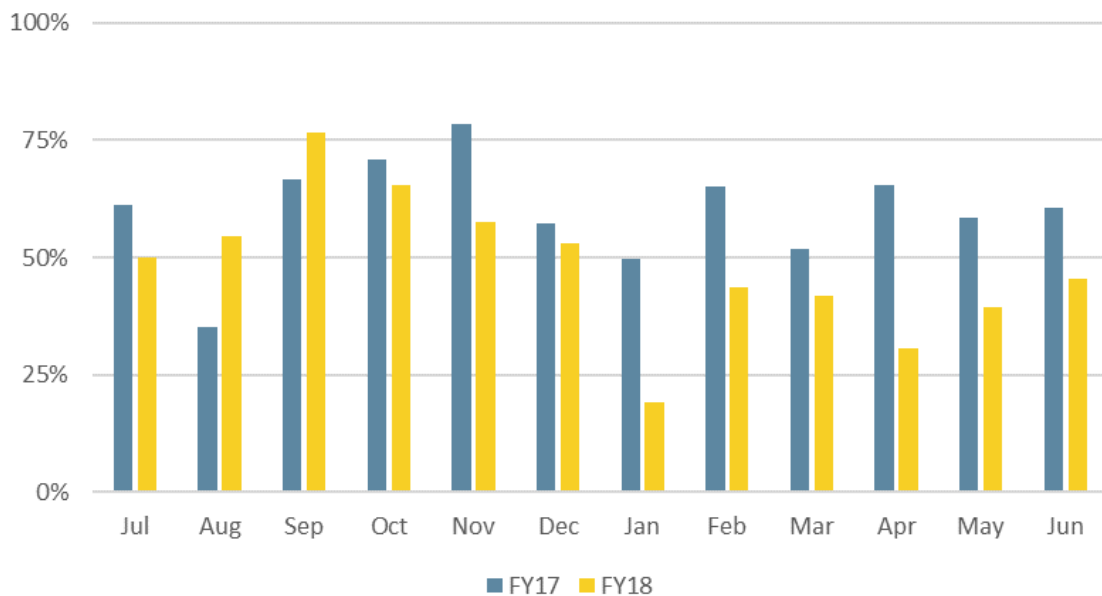
Month	Total Hours in Month	Big Stone	Coyote	Big Stone % of hours	Coyote % of hours
Jul	744	439	372	59%	50%
Aug	744	502	405	67%	54%
Sep	720	469	552	65%	77%
Oct	744	275	488	37%	66%
Nov	720	408	414	57%	58%
Dec	744	382	394	51%	53%
Jan	744	285	142	38%	19%
Feb	672	280	294	42%	44%
Mar	744	280	311	38%	42%
Apr	720	126	221	18%	31%
May	744	237	293	32%	39%
Jun	720	299	328	42%	46%
Total	8760	3982	4214	45%	48%

This same data is presented in graphic form below, by unit.

Graph C: Big Stone Hours Cost > Revenue



Graph D: Coyote Hours Cost > Revenue



c. Evaluation of net cost or benefit

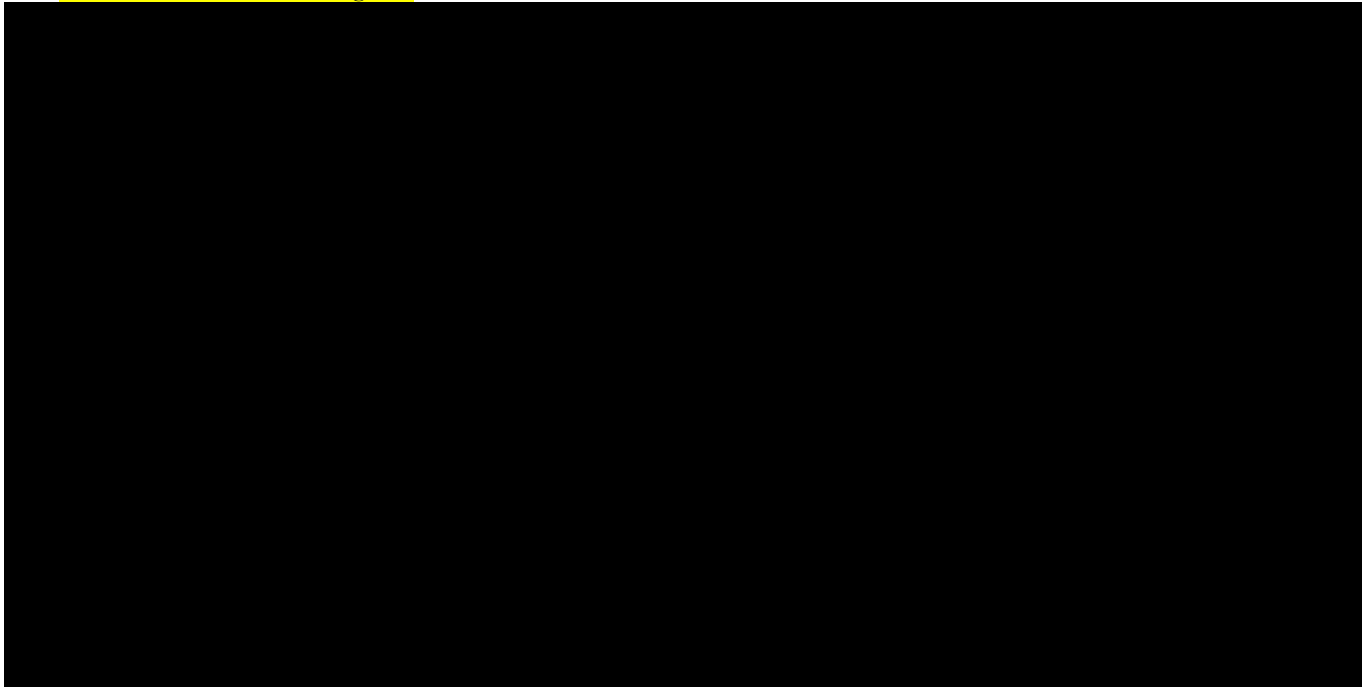
As discussed above, all of the compliance filings examined the difference between production cost and DART revenues for each unit and fiscal year. In the remainder of this comments, we refer to this as the “net cost or benefit” of self-scheduling. The following section examines the annual net cost or benefit in several ways:

- For all hours of the year, using only fuel cost (i.e. Otter Tail's methodology)
- For all hours of the year, using variable operations and maintenance cost as well as fuel cost
- For all hours of the year, using the variable production cost reported on FERC Form 1

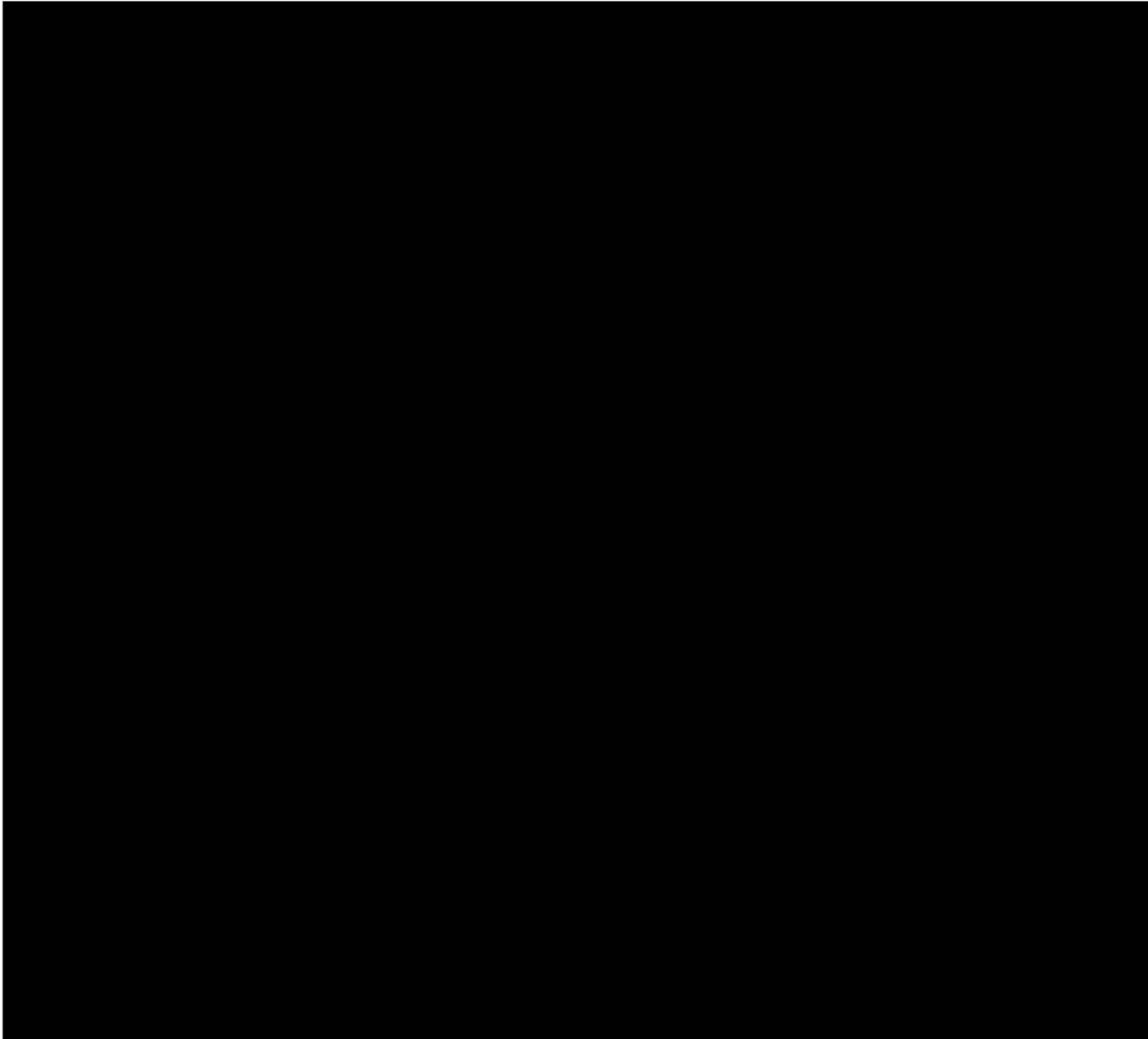
i. All hours, fuel cost only

The chart and graphs below show the net cost/benefit incurred by Big Stone and Coyote by month, when including just fuel costs.

[Trade Secret Data Begins]



[Redacted text block containing six lines of blacked-out content]



[Trade Secret Data Ends]

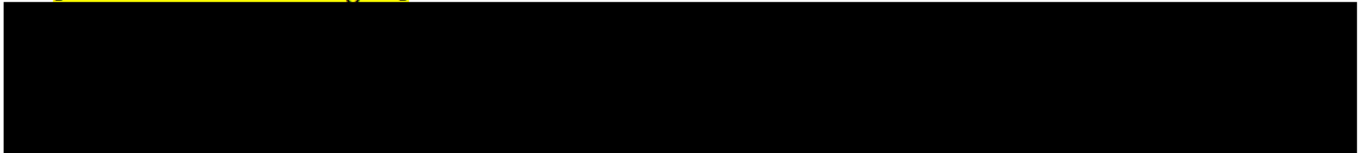
ii. All hours, variable O&M plus fuel costs

While Otter Tail did not include variable operations and maintenance (O&M) in their calculation of cost in the May 8 filing, and these costs are not recoverable under the fuel clause, they are included in the offer curve submitted to the MISO energy market. Otter Tail's Response to Fresh Energy IR 1 Part B stated the following:

Unit costs reflect those variable costs which are subject to recovery through the fuel clause. Certain variable O&M costs are recovered through base rates such as reagents and emissions allowances.¹⁴

Otter Tail's table showing annual variable O&M costs are reproduced below.

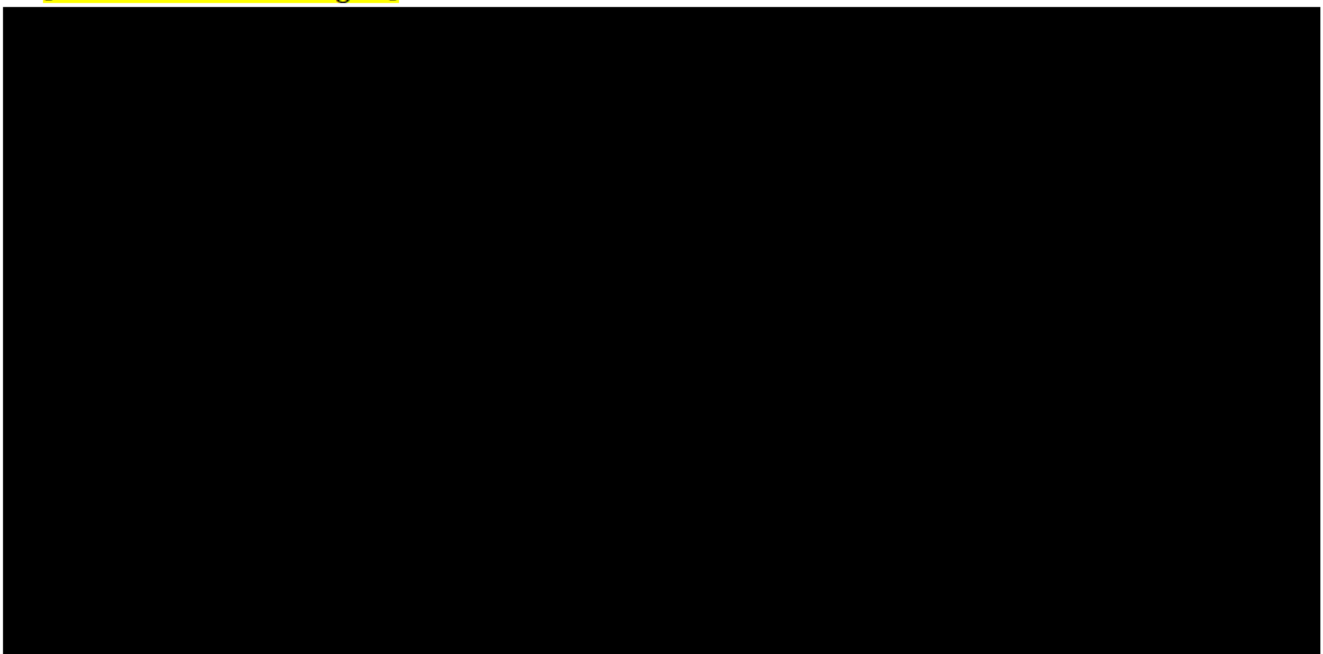
[Trade Secret Data Begins]



[Trade Secret Data Ends]

For this reason, we felt it was important to evaluate the net cost and benefit of self-scheduling when including variable O&M as well as fuel cost. The chart below shows results using all hours, when including variable O&M. Again, shaded areas are when costs exceed revenues.

[Trade Secret Data Begins]



[Redacted text block]

[Trade Secret Data Ends]

¹⁴ Otter Tail, *Response to Fresh Energy IR 1*, July 25, 2019 Dockets E999/AA-17-492 and E999/AA-18-373, page 3 ([link](#)).

Including variable O&M does not change the overall pattern substantially, however it does lower net revenue by a substantial margin, shown in the table below.

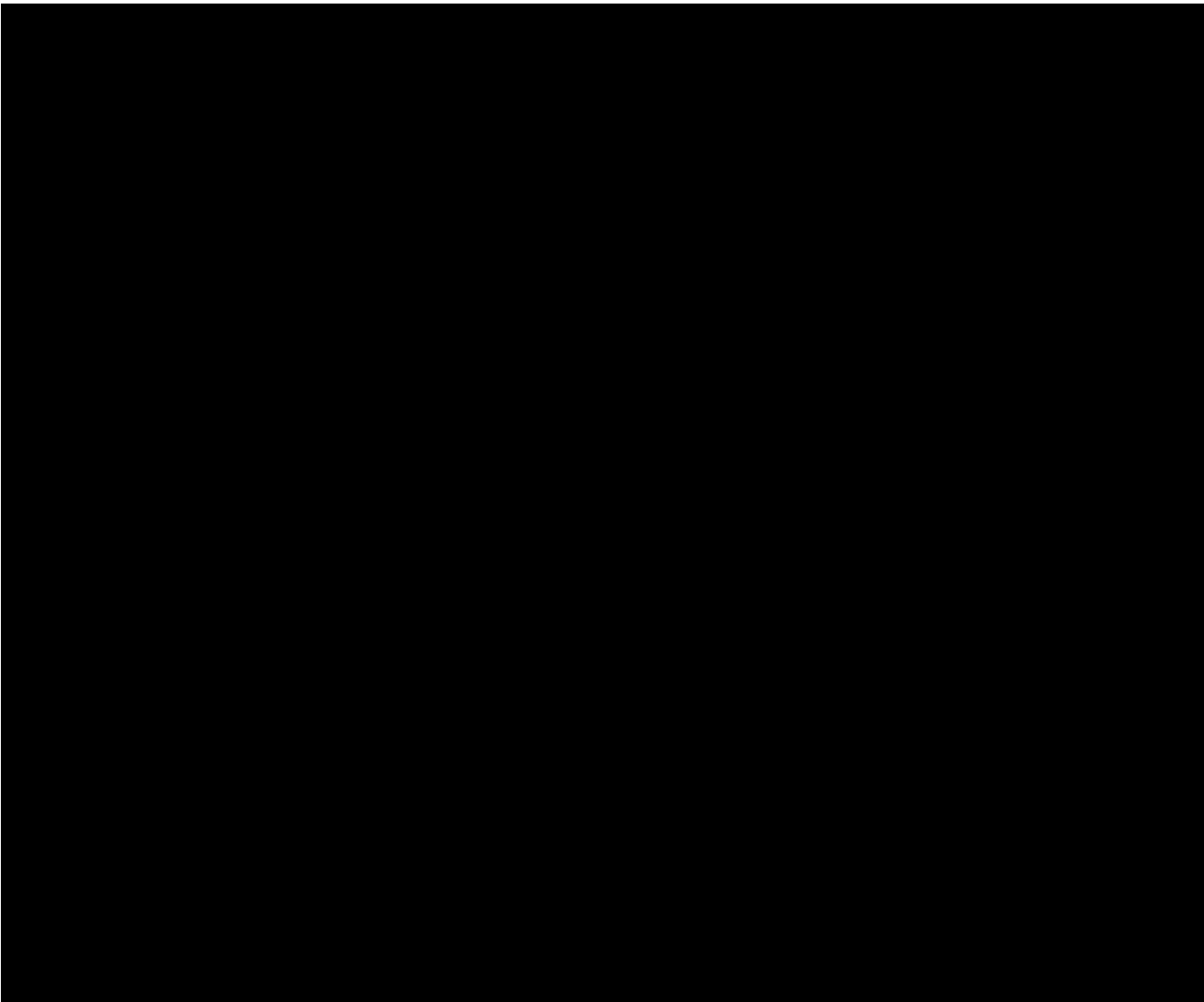
[Trade Secret Data Begins]



[Trade Secret Data Ends]

The graphs below show the net cost and benefit calculated across all hours of each fiscal year, comparing results when just using fuel costs to results including fuel *and* variable O&M costs.

[Trade Secret Data Begins]



[Trade Secret Data Ends]

iii. All hours, FERC Form 1 production costs

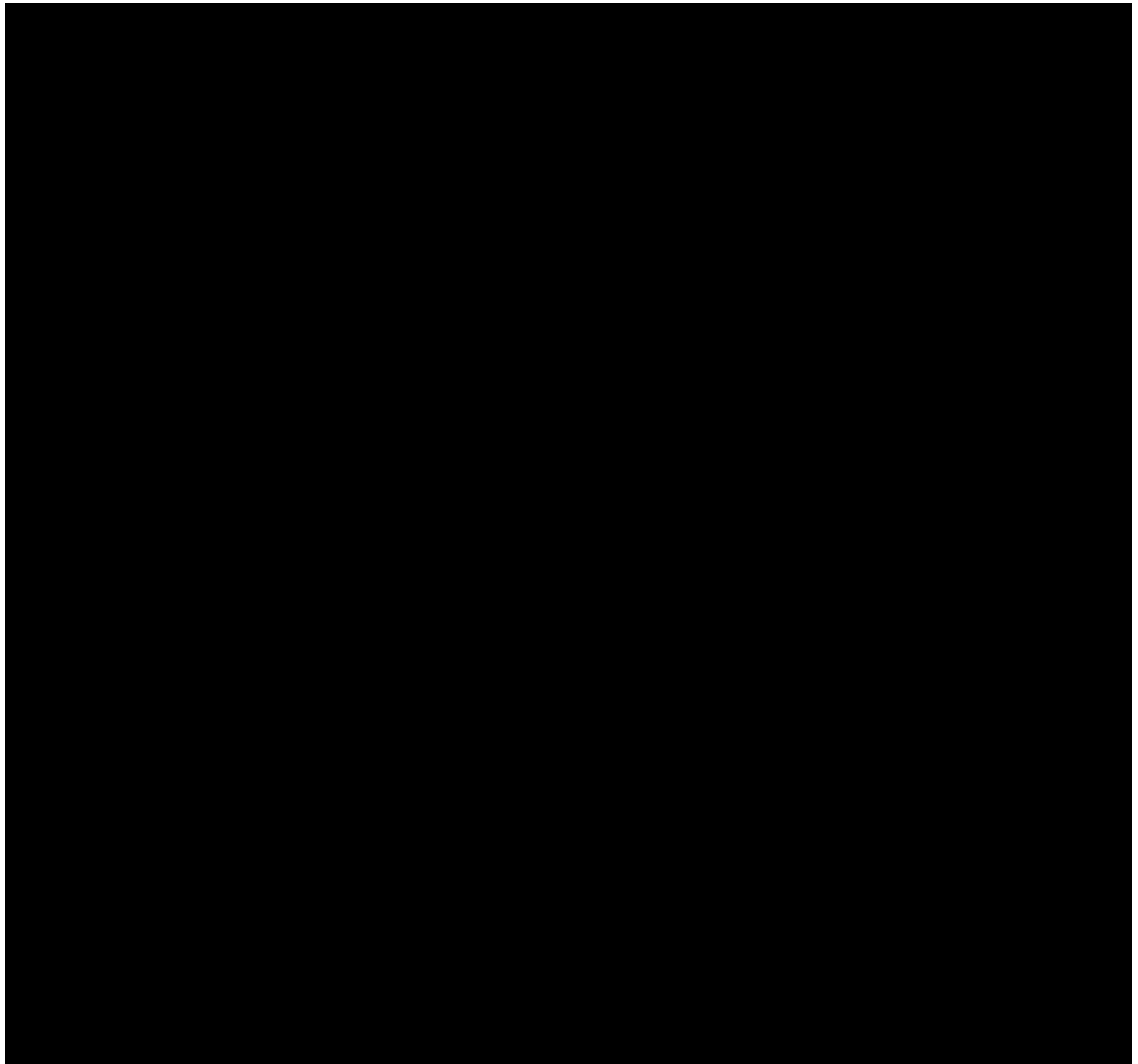
In performing this analysis, we discovered that the level of production costs reported on FERC Form 1 in 2016-2018 for Big Stone, Coyote, and Hoot Lake¹⁵ is significantly higher than the level reported in Otter Tail's compliance filing and Response to Fresh Energy IR 1. We hope that this discrepancy is the result of certain costs being included in the FERC Form 1 report that the utilities do not typically consider variable fuel or O&M costs, or that are not included in the MISO offer curves for these plants. However, we were not able to determine what costs are driving this difference and if they are properly excluded from Otter Tail's analysis.

Nonetheless, for the purposes of comparison, the chart and graphs below illustrate this differential for each unit, showing net cost and benefit for all hours using first Otter Tail's reported fuel and variable O&M cost, and then the production cost reported on FERC Form 1 for 2016-2018.

[Trade Secret Data Begins]



¹⁵ See Otter Tail Power's FERC Form 1 years 2016-2018, Section 402, Row 35 "Expenses per Net kWh," under Production Expenses for the relevant plant. These sections are included in Attachment B.



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[Trade Secret Data Ends]

IV. Summary and Recommendations

a. Methodology

Access to underlying data, assumptions, and calculations is a foundational component of effective stakeholder engagement. Fresh Energy respectfully recommends the following modifications for future filings on this matter in the interest of consistency and clarity:

1. Utilities should report the self-commitment and self-scheduling analysis using a consistent methodology and should clearly define their assumptions and data inputs in the compliance filing.
 - a. Additional direction from the Commission on how utilities should define production cost for this analysis would be helpful. Fresh Energy recommends including fuel cost and variable O&M costs, matching the offer curve submitted to MISO energy markets.
2. Utilities should provide stakeholders with the underlying data (workpapers) used to complete the analysis, in a live Excel spreadsheet.
 - a. Fresh Energy recommends that the attachment referred to in recommendation 2 include at minimum the data points listed below for each generating unit, with the understanding that this attachment may include protected data.

Hourly data for all units:

- a) Date and hour
- b) Commit status (Null / Economic / Emergency / Must Run / Outage / Not Participating)
- c) Dispatch Status for Energy (Null / Economic / Self Schedule)
- d) Cleared MW
- e) Day ahead locational marginal price at unit node
- f) Real time MW adjustment
- g) Real time locational marginal price at unit node
- h) Day ahead dispatch minimum
- i) Real time dispatch minimum
- j) Fuel cost (\$/MWh)
- k) Variable operations and maintenance costs (\$/MWh)
- l) Day ahead locational marginal price representative of utility load zone
- m) Real time locational marginal price representative of utility load zone
- n) Whether Day Ahead Cleared = Day Ahead Dispatch Minimum (0 or 1)
- o) Actual production in MWh (for all 8,760 hours of the year)
- p) Day ahead MISO payment
- q) Real time MISO payment
- r) Net MISO energy payment
- s) Production costs $((J+K) * O)$
- t) Net cost or benefit $(R - S)$

Monthly or annual data for all units:

- u) Revenue from ancillary services (monthly)
- v) Fixed operations and maintenance costs (preferably monthly)
- w) Capital revenue requirements (annual)
- x) Average heat rate at economic minimum

y) Average heat rate at economic maximum

Fresh Energy understands that fixed operations and maintenance costs, capital revenue requirements, and MISO payments when the plant is set to economic dispatch do not have a direct bearing on the net cost or benefit of self-committed and self-scheduled hours. However, this data is essential for evaluating how self-scheduling and self-commitment fit into a unit's overall operation, how a unit performs when being dispatched economically, and how the MISO market responds to different dispatch statuses. However, if the Commission decides that is beyond the scope of this investigation, it could omit v) and/or w) above.

Consistency in methodology, clarity about the calculations being performed, and inclusion of this data upfront will enable more robust and timely stakeholder engagement.

b. Further Investigation

As discussed in Section III, the evaluation of net cost or benefit by month for Big Stone and Coyote reveals a seasonal trend, [Trade Secret Data Begins] [Trade Secret Data Ends]. For each fiscal year, the months when both units show [Trade Secret Data Begins] [Trade Secret Data Ends] is quite consistent, signaling that weather and market conditions have a large impact on this cost/benefit evaluation. While we have not completed a counterfactual analysis, the results of the preliminary net revenue evaluations above indicate that Big Stone and Coyote may have higher net revenues on an annual basis if the units were idled or dispatched on an economic basis during certain months, [Trade Secret Data Begins] [Trade Secret Data Ends].

This raises several questions about the technical and economic limitations of changing these plants' commitment and dispatch status more regularly, how the plant's net revenues would change if operated differently, and which aspects of the plants' joint ownership arrangements are currently barriers or limitations to changes in operating strategy. For example, it seems that changing the commitment status of either plant to "economic"¹⁶ for full output would greatly reduce the hours the units are running at a loss. Using this commitment status would still make the units available to the market. However, in this scenario, if a unit is not economically dispatched, it would not be running and would need to incur a "start-up cost" in any subsequent market offers.

However, utilizing an "economic" commitment would 1) still enable the units to qualify for MISO and SPP resource adequacy purposes; 2) would still protect Otter Tail customers from

¹⁶ As defined in MISO Energy and Operating Reserve Markets Business Practices Manual BPM-002-r19 Effective Date: OCT-15-2018, section 4.2.3.4.6 at p. 93 ([link](#)).

unexpected high market prices, because in those cases the units would be dispatched economically. Even accounting for a “start-up cost” that would be included in a market offer price any time the unit was not running, the plant’s marginal costs plus start-up cost would provide a very reasonable protection, or “hedge” for Otter Tail customers in the case of unusually high or unexpected market prices; and 3) in months that have consistently higher market prices, the unit would likely dispatch on the first day with higher prices.

Finally, utilizing an “economic” commitment does not need to be selected for a whole year, or even monthly. Rather, it is a daily decision. Therefore, another option would be for Otter Tail to consider utilizing “economic” commitment only for certain periods of time for more optimal operation of Big Stone and Coyote.

For these reasons, Fresh Energy recommends that the Commission require Otter Tail to make a compliance filing analyzing the potential options for seasonal dispatch generally, and potential options and strategies for utilizing “economic” commitments for Big Stone and Coyote. In addition to the cost saving opportunity for customers from these approaches, the filing should include a specific explanation of barriers or limitations to each of these potential options, including but not limited to technical limits of the units and contract requirements (shared ownership, steam offtake contracts, minimum fuel supply requirements, etc.) as relevant.

Fresh Energy greatly appreciates the Commission’s interest in self-commitment and self-scheduling. We intend to continue to follow this important issue and to provide more in-depth feedback and analysis in future compliance filings. Please contact me at (651) 294-7148 or ricker@fresh-energy.org if you have any questions regarding this filing.

Respectfully submitted,

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Attachment A: Calculations, Workpapers and Underlying Data

Please see excel workbook Attachment A separately filed
in Dockets 17-492 and 18-373.

Attachment B: Otter Tail Power FERC Form 1, Section 402, 2016-2018

Please see PDF Attachment B separately filed
in Dockets 17-492 and 18-373.