MINNESOTA
PUBLIC UTILITIES COMMISSION

# Staff Briefing Papers

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| **Meeting Date** | **October 26, 2023** | | **Agenda Item 6**** |
| Company | All Electric Utilities | | |
| Docket No. | **E-999/CI-19-704** | | |
| | **In the Matter of an Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities** | | |
| | **E002/M-19-809** | | |
| | **In the Matter of the Petition of Northern States Power Company for Approval of a Plan to Offer Generating Resources into the MISO Market on a Seasonal Basis** | | |
| Issues | 1. Have the utilities provided adequate information in the March 2022 compliance filings on self-commitment?<br>2. Should the utilities be required to provide additional information or take additional steps regarding self-commitment at this time?<br>3. Should the filing requirements for future years be modified?<br>4. Should the Commission take action based on changes to Minnesota Statute §216B.2422 or other statute during the 2023 Legislative Session?<br>5. Should the Commission order Xcel to dispatch King seasonally? | | |
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| ✓ **Relevant Documents** | **Date** |
|---|---|
| **Reports** | |
| Xcel Energy – Compliance Filing & Attachments | March 1, 2023 |
| Otter Tail Power Company – Compliance Filing & Attachments 1-3 | March 1, 2023 |
| Minnesota Power – Self Commit & Attachments 1 & 2 | March 1, 2023 |
| Xcel Energy – 2022 Annual Report – Correction | April 21, 2023 |
| **Comments** | |

| ✓ **Relevant Documents** | **Date** |
|---|---|
| Department of Commerce – Comments | May 31, 2023 |
| Xcel Energy – Reply Comments | June 30, 2023 |
| Minnesota Power – Reply Comments | July 31, 2023 |
| Otter Tail Power Company – Reply Comments | July 31, 2023 |
| Fresh Energy & The Sierra Club – Reply Comments | July 31, 2023 |
| Department of Commerce – Comments | August 15, 2023 |
| Xcel Energy – Reply Comments | August 15, 2023 |
| **Prior Orders** | |
| PUC – Order – Docket No. E-999/AA-18-373 | November 13, 2019 |
| PUC – Order Clarifying Filing Requirements and Schedule | May 4, 2020 |
| PUC – Order Evaluating Self-Commitment and Self-Scheduling Reports | January 11, 2021 |
| PUC – Order Accepting Reports and Setting Additional Requirements | December 1, 2021 |
| PUC – Order | November 17, 2022 |

## BACKGROUND

On November 13, 2019, the Commission ordered Xcel Energy (Xcel), Otter Tail Power (Otter Tail), and Minnesota Power (MP) to annually file reporting on the utilities' use of self-commitment and self-scheduling of its baseload generation plants in the Midcontinent Independent System Operator (MISO) market. Since 2019, all three utilities have made significant changes to their self-commitment practices, with many coal-fired facilities switching to an economic or seasonal-commitment policy for generation in MISO.

During the most recent legislative session, Minnesota Statute §216B.2422 was amended to allow the Commission to order utilities to dispatch coal plants on a seasonal basis or establish an annual limit on carbon dioxide emissions from coal-fired electric generating units.

On March 1, 2023, the electric utilities filed their annual reports for 2023.

Questions before the Commission include:

- Have the utilities provided adequate information in the March 2022 compliance filings on self-commitment?
- Should the utilities be required to provide additional information or take additional steps regarding self-commitment at this time?
- Should the filing requirements for future years be modified?
- Should the Commission take action based on changes to Minnesota Statute or other statute during the 2023 Legislative Session?

## DISCUSSION

### I. Background

The MISO markets identify the supply of electric generation available throughout the MISO regions, and the anticipated (and, in the real-time market, 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 for electricity. 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.

Self-commitment and self-scheduling are "commitment" and "dispatch" statuses available to electricity generators participating in the MISO Day Ahead wholesale power market.

Self-commitment allows a market participant to request that MISO commit a particular unit to run, regardless of market price. In MISO, this is referred to as "must run" status. Unless there is a reliability issue, MISO will commit the unit, at a minimum, to that unit's specified "economic" minimum output level. The unit acts as a price taker, accepting whatever the clearing price for that period happens to be. This may be below the unit's cost to generate. Depending on reliability needs and market prices, MISO may also commit the unit to production above economic minimum.

Self-scheduling enables participants to submit hourly generation schedules to MISO. Self-scheduling does not guarantee dispatch but does predetermine minimum output levels. Units are price takers up to the self-scheduled generation amount but may be dispatched at higher levels up to the unit's economic maximum, depending on market pricing and reliability needs.

In its February 7, 2019, ORDER ACCEPTING 2016-2017 REPORTS AND SETTING ADDITIONAL REQUIREMENTS[1] the Commission discussed self-commitment and self-scheduling as follows:

> 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

[1] In the Matter of the Review of the 2016-2017 Annual Automatic Adjustment Reports for All Electric Utilities, Docket No. E-999/AA-17-492, and In the Matter of the Review of the 2017-2018 Annual Automatic Adjustment Reports for All Electric Utilities, Docket No. E-999/AA-18-373

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.

The Commission directed Minnesota Power, Otter Tail, and Xcel Energy to make compliance filings containing initial analysis of the impacts of self-committing and self-scheduling their generators, including the annual difference between production costs and corresponding prevailing market prices. In response to information requests from parties, the utilities also provided hourly and monthly data.

At the Commission's October 10, 2019, electric Annual Automatic Adjustment (AAA) agenda meeting, the parties requested, and the Commission agreed, that the issues surrounding self-commitment and self-scheduling be moved to a separate docket to provide a more focused forum for these issues. Thus, the Commission opened an investigation in this docket to require Minnesota Power, Otter Tail, and Xcel Energy to report their future self-commitment and self-scheduling analyses using a consistent methodology by including fuel cost and variable Operations and Maintenance (O&M) costs.

In its November 13, 2019 ORDER ACCEPTING 2017-2018 ELECTRIC REPORTS AND SETTING ADDITIONAL REQUIREMENTS (November 13, 2019 Order),[2] the Commission:

8. Directed Minnesota Power, Otter Tail, and Xcel Energy to submit "an annual compliance filing analyzing the potential options for seasonal dispatch generally, and potential options and strategies for utilizing "economic" commitments for specific coal-fired generating plants. The utilities shall 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

[2] In the Matter of the Review of the 2017-2018 Annual Automatic Adjustment Report for All Electric Utilities, Docket No. E-999/AA-18-373

contracts, minimum fuel supply requirements, (shared ownership, steam offtake contracts, minimum fuel supply requirements, etc.) as relevant, on March 1, 2020, and each year thereafter."

9. The Commission opened the investigation in this docket and required Minnesota Power, Otter Tail, and Xcel Energy to report their future self-commitment and self-scheduling analyses. The Commission ordered the utilities to use a consistent methodology by including fuel cost and variable O&M costs, matching the offer curve submitted to MISO energy markets.

10. Directed Minnesota Power, Otter Tail, and Xcel Energy to provide stakeholders the underlying data used to complete their analyses, in a live Excel spreadsheet, including, at a minimum, the data points listed below for each generating unit, with the understanding that this 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) or reasonable estimates in approximation thereof
    w) Capital revenue requirements (annual) or reasonable estimates in

approximation thereof
x) Average heat rate at economic minimum
y) Average heat rate at economic maximum

Docket No. E-999/CI-19-704 was opened to investigate the use of self-commitment and self-scheduling by the regulated electric utilities in Minnesota. On December 13, 2019, the Commission issued its notice requesting procedural comments. On January 10, 2020, the parties filed initial comments on the scope of this investigation, with reply comments filed on January 28, 2020. In those comments, parties raised the question of the period covered by the reporting required in the November 13, 2019 Order, with various parties suggesting different time periods for the first set of comments, which were received on and around March 1, 2020, from Minnesota Power, Xcel Energy, and Otter Tail Power Company (Otter Tail).

The Commission took up this docket on February 29, 2020 and provided clarification on filing requirements and deadlines.[3] On January 11, 2021, the Commission Order Evaluating Self-Commitment and Self-Scheduling Reports and Establishing Additional Filing Requirements approved the 2019 reports by Xcel and Otter Tail, required MP to file additional information on its 2019 reports by February 1, 2021 and, in addition to all existing reporting requirements, established additional reporting requirements for the 2020 and later reports:

- Include ancillary services revenues and any other make-whole payments as a separate column in all reporting on revenue from generation.
- Utilities should provide Unit Fuel Costs and Unit Variable Cost as separate line items.
- If a utility excludes any fuel costs from its MISO offer curves, the utility should also provide an analysis that includes all fuel costs, including those currently treated as fixed costs due to contractual terms.
- Utilities should include all preventative maintenance in O&M costs for reporting purposes.
- Any hours with unavoidable self-commitment should be labeled as such, with a cause listed for the self-commitment in that hour. (Testing, contract, dispatch of co-owned generation, etc.)
- Future analyses of self-commitment and self-scheduling should include all production costs including fuel, variable O&M, and other variable costs associated with the plant.
- To the extent not already provided, utilities should provide the following:
    i. Length of minimum decommit time for each unit;
    ii. Number of times in the analysis period that each unit incurred losses over a duration greater than or equal to its minimum decommit time;

[3] ORDER CLARIFYING FILING REQUIRMENTS AND SCHEDULE, In the Matter of the Review of the 2017–2018 Annual Automatic Adjustment Report for All Electric Utilities, Docket No. E-999/AA-18-373, and In the Matter of an Investigation into Self-Commitment and Self-Scheduling of Large Baseload Generation Facilities, Docket No. E-999/CI-19-704 (May 4, 2020)

iii. Of the periods identified in (ii), the number of periods when losses were greater than the relevant startup cost (warm or cold startup cost, depending on the length of the period); and
iv. Sum of losses in excess of startup cost that were incurred during periods identified in (iii).

- A complete analysis of the costs and benefits of economic or seasonal dispatch relative to self-scheduling at the following facilities:
  i. Boswell 3 and Boswell 4 – MP
  ii. Coyote Station – Otter Tail
  iii. Sherco 1 and Sherco 3 – Xcel
  iv. Big Stone – Otter Tail
- Otter Tail shall provide a discussion of the options and costs of changing its current coal contract at Coyote Station and an evaluation of how potential costs of changing the contract compare to Coyote Station's past and forecast operating losses in Docket No. E-999/CI-19-704.
- Utilities with co-ownership of baseload generating units shall discuss options of economically committing those units within the terms of their partnership in the March 1, 2021 compliance report.
- Minnesota Power, Otter Tail, and Xcel Energy shall evaluate whether reducing minimum operating levels would benefit customers and include that evaluation and discussion in the March 1, 2021 compliance report.

In its Order Accepting Reports and Setting Additional Requirements of December 1, 2021, the Commission accepted the 2020 reports, approved Minnesota Power's amended 2019 report, and set the following additional requirements for future reports:

- Minnesota Power shall file the system strength study which it has commissioned a consultant to complete in this docket when completed.
- Future reports shall contain the following information:
  - Information on annual carbon dioxide emissions.
  - Reasons for unavoidable self-commit status designations.
  - Plant startup conditions (e.g., cold, warm, or hot).
  - Equivalent Forced Outage Rate information to be tracked over time, and
  - Descriptions of changes to operating procedures and physical modifications to units to ensure plants are becoming more flexible to meet upcoming challenges, as applicable.
- The electric utilities shall develop a methodology, that is consistent to the extent possible, for splitting fuel costs such that one part depends on the megawatt-hour (MWh) production (i.e., variable cost) and the other part is independent of the MWh generated (i.e., fixed cost) and update the reporting template accordingly.

- Utilities shall work together to develop a consistent method for estimating the best-case and worst-case potential for economic commitment for each plant.

In its Order of November 17, 2022, the Commission accepted the 2021 reports, and set the following additional requirements for future reports:

- Xcel shall provide, in future reports, instances when greater economic commitment lead to lost revenue. If there were such instances, the utility should describe its strategy to weigh those lost revenues with the environmental benefits of lower emissions.
- Otter Tail shall include MISO and SPP market conditions in determining its self-commitment endorsement and show Net Benefit results in addition to the analysis provided by Otter Tail in Tables 6 and 8 of its 2021 filing.
- Otter Tail shall include in its 2023 and 2024 annual reports an update on its progress toward implementing the Total Plant Offer Optimization Plan and Combined Modeling of MISO Co-Owner Generation Shares Plan at Big Stone Plant and Coyote Station.
- Utilities shall provide avoided carbon dioxide emissions due to economic commitment along with plant level carbon dioxide emissions, using the Department's recommended method.
- Utilities shall provide Equivalent Forced Outage Rate (EFOR) information to be tracked over time.
- Utilities shall provide Energy (MWh) produced and curtailed from utility owned and contracted wind facilities monthly for each facility in subsequent filings in this docket.

## II. Utility Filings

### A. Xcel Energy

Xcel Energy filed its annual report on March 1, 2023, with the exception of its narrative, which it filed as a correction on April 21, 2023. (Xcel had inadvertently filed its Annual Fuel True-Up Report, intended for Docket AA-21-295, with its schedules on March 1.)

#### a. Self-Commitment and Self-Scheduling

Xcel analyzed the economic impact of its self-commit actions by comparing the MISO day-ahead and real time revenues and charges that it received from its self-commit approach for certain resources to production costs to determine margin.

In Fall 2021, Xcel began to suspend normal operations at King and Sherco 2 during non-peak seasons. However, in March 2022, MISO's Independent Market Monitor (IMM) raised concerns regarding the reasonableness of the plan to idle during Spring 2022, and both units cleared the 2022-2023 MISO Planning Reserve Auction (PRA). As a result, both plants have been offered on an economic basis since last March.

Xcel has dispatched nuclear on an economic basis in the day-ahead market since September 2019, treating fuel costs as fixed since June 2020. During 2022, Xcel did not self-schedule (i.e. set a fixed level of output for the plant) for any hours, but there were hours of self-commitment.

**Figure 1: 2022 DART Margin for Non-Discretionary Self-Commit of Baseload Units**

| 2022 DART Margin for Non-Discretionary Self-Commit of Baseload Units | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Net MISO Payment Less Production Cost - (cost)/benefit** | | | | | | | |
| NSP.KING1 | NSP.SHERCO1 | NSP.SHERCO2 | NSP.SHERCO3 | NSP.PRISL1 | NSP.PRISL2 | NSP.MNTCEL1 | TOTAL |
| $ 11,069,678 | $ 67,008,419 | $ 32,288,153 | $ 41,008,353 | $ 208,713,117 | $ 207,898,946 | $ 222,222,357 | $ 790,209,022 |
| **Net MISO Payment Less Total Production Cost Including Remaining Unit Fuel Cost - (cost)/benefit** | | | | | | | |
| NSP.KING1 | NSP.SHERCO1 | NSP.SHERCO2 | NSP.SHERCO3 | NSP.PRISL1 | NSP.PRISL2 | NSP.MNTCEL1 | TOTAL |
| $ 11,069,678 | $ 67,008,419 | $ 32,288,153 | $ 41,008,353 | $ 171,811,774 | $ 169,854,954 | $ 186,797,630 | $ 679,838,960 |

In evaluating self-commitment, Xcel excluded unavoidable self-commitment, such as mandatory resource testing, offtake contract requirements, system reliability, and maintenance outages. These instances are noted in Attachments A & B. The analysis only considers strategic self-commitment.

Based on its analysis, Xcel believed that the lack of multi-day commitment leads to less assurance that the market will commit and de-commit baseload resources with slower start-up and longer minimum down times in an optimal manner, and continues to advocate for a multi-day commitment process.

### b. Avoided Carbon Dioxide Emissions

The below table shows avoided and actual CO2 emissions by unit.

**Table 1: 2022 $CO^2$ Emissions by Unit**

| Unit | Actual Tons | Avoided Tons |
|---|---|---|
| King | 1,385,510 | 476,869 |
| Sherco 1 | 3,955,004 | 69,911 |
| Sherco 2 | 3,416,090 | 66,640 |
| Sherco 3 | 2,423,237 | 119,360 |

### c. Minimum Operating Levels and other Plant changes

Xcel found that reducing minimum required load from 260 MW to 215 MW produced $261k in customer benefits in 2022.

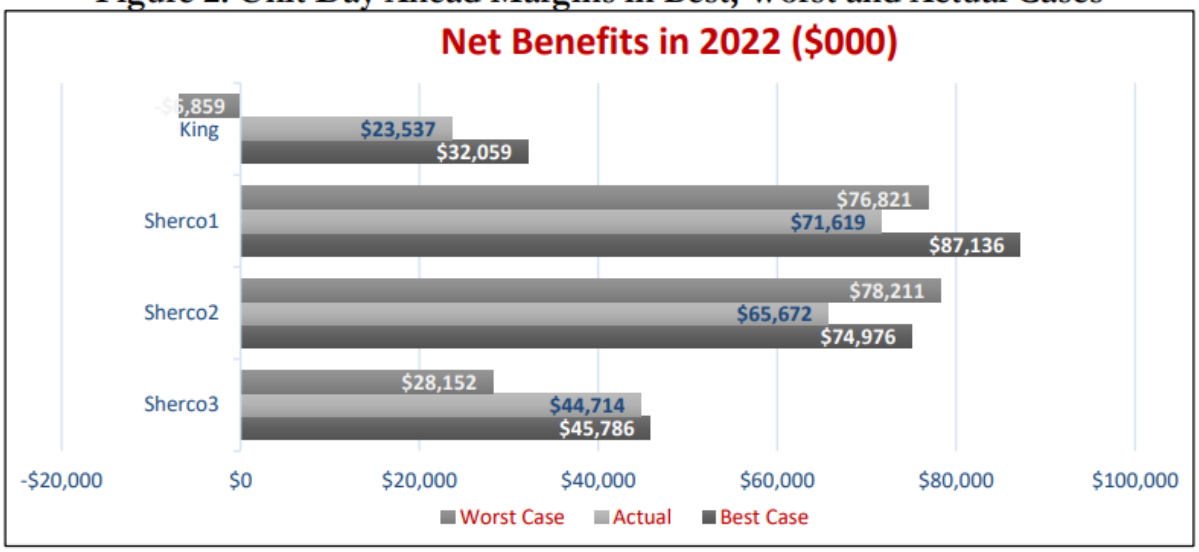
At King, Xcel has created a Seasonal Dispatch Best Practices document to address maintenance, layup, and equipment management during extended shutdowns. Additionally, Xcel continued

to evaluate opportunities to provide resource flexibility to MISO.

### d. Best and Worst Case Analysis

Utilities agreed to use a year-round economic commitment scenario as "Best Case" and a year-round self-commitment/must run scenario as "Worst Case". Results are shown in the Figure 2 below. In some cases, actual results are outside the boundaries of "Best Case" and "Worst Case" due to dispatch differences between Plexos modeling and actual MISO day ahead awards.

**Figure 2: Unit Day Ahead Margins in Best, Worst and Actual Cases**




### e. Economic & Seasonal Dispatch at Sherco 1 & 3

Xcel and Southern Minnesota Municipal Power Agency (SMMPA) operate Sherco 3 under a joint operating agreement. To facilitate Sherco 3's economic dispatch, on March 1, 2021, a Coordination Agreement came into effect allowing for submission of Sherco 3 as a single asset into MISO. For 2022, economic dispatch increased margins (i.e. reduced profitability) by $17.7 million at Sherco 3, primarily attributed to coal mitigation efforts in March through May. Xcel noted that the lack of a multi-day commitment model hindered its ability to dispatch this unit in its most economically efficient manner; however, despite the increased costs, the plant was still profitable. Xcel also noted that economic dispatch reduced carbon emissions by 1.38 billion pounds of CO2.

Due to requests from SMMPA, Sherco 3 was dispatched on a Must Run basis through February 2022 to be available for extreme events during the winter heating season. SMMPA terminated the Coordination agreement as of November 29, 2022, and so Sherco 3 is now again being offered on a Must Run basis with periods of discretionary Economic commitment. Xcel is committed to working with SMMPA on an agreement that is mutually beneficial to all parties and customers.

Xcel anticipated approval of its air permits for its new auxiliary boilers at Sherco in third quarter 2023. Until those boilers are available, Sherco 1 needs to be held available for auxiliary steam. Xcel noted that Sherco 2 will cease operations on December 31, 2023.

#### f. Seasonal Dispatch Plans for King and Sherco 2

In 2022, King was operating on a seasonal basis from March 5-24 but, due to MISO commitments, was removed from seasonal commitment. Sherco 2 was in outage through most of March and has been under MISO commitment through the rest of the 22-23 winter season. Sherco 1 was in Must Run, as noted above, for steam needs in March and has not been deployed on a seasonal basis since.

In its Reply Comments of June 30, 2023, Xcel noted that, despite the expiration of the PRA auction commitment, it is not currently deploying either King or Sherco 2 on a seasonal basis. Xcel did state that if it were ordered to dispatch King on a seasonal basis, it would continue to provide similar annual reporting as it had committed to providing in Docket No. E-002/M-19-809.

### B. Minnesota Power

#### a. Economic Dispatch of Boswell 3 and 4

Minnesota Power continued to work with its partner WPPI Energy on a plan for economic commitment of Boswell 4 but has not yet reached an agreement. Therefore Boswell 4 continues to be dispatched on a must-run basis.

Boswell 3 is dispatched on an Economic basis. Minnesota Power provided the economic effects of self-commitment and economic commitment, as well as decommitment time, minimum run time, and other details on a trade secret basis.

MP has identified several issues as obstacles to economic commitment of Boswell 4. They include questions around re-registration of Boswell 4 as a single generator, changes to modeling of Boswell 4 in MISO, and possible need for a new MISO market coordination agreement with WPPI. MP also noted the need for backup steam at Boswell, which would prevent both units from being on Economic dispatch at the same time in the winter months and expects auxiliary natural-gas fired heating boilers to be available at Boswell starting in the 2024-2025 heating season.

MP, like Xcel, noted the lack of multi-day commitment as a barrier to economic dispatch. MP did note that MISO has improved tools which provide insight into supply and demand in MISO for forecasting across multiple days, but forecasting alone doesn't provide the assurance that the decision to dispatch economically on a day-to-day basis will maximize unit economics for plants with long lead times. MP noted that MISO appears to have closed any action on this

issue for the time being.

MP noted that Boswell provides transmission reliability in its region, and that economic dispatch might have impacts on voltage support and system strength, as well as regional voltage stability. MP filed its analysis of the Transmission system reliability in the absence of Boswell in its "Summary Report on System Strength & Voltage Support Impacts in Northeastern Minnesota" in this docket on July 22, 2022.

MP also noted that its emissions permitting requires periodic extended run-times to ensure margins to comply with permit requirements. MP has not yet had the opportunity to test Boswell 3 under intermittent use conditions, as it has been consistently dispatched. However, MP is continuing to monitory emission impacts due to economic dispatch. Similarly, MP is monitoring potential effects of cycling on maintenance, but has not yet sufficient data to optimize maintenance under economic dispatch.

#### b. Plant Modifications

Minnesota Power noted that, in November 2021, Boswell 3 reduced operational minimums from 175 MW to 75 MW. Boswell 4 moved from 300 MW to 210 MW in 2018, and further was able to reduce emergency minimums from 210 MW to 185 MW in December 2021. At this time no further reductions are anticipated, but MP continues to explore other opportunities.

Under its currently approved IRP, Boswell 3 will cease coal operations by 2030, and Boswell 4 will cease coal operations by 2035.

#### c. Carbon Emissions

**Table 2 – Minnesota Power Carbon Dioxide Emissions**

| Unit | Actual Tons | Avoided Tons |
|---|---|---|
| Boswell 3 | 2,604,971 | 2,087[4] |
| Boswell 4 | 2,618,437 | 0 |

Due to high market prices, Boswell 3 was consistently dispatched during 2022. As such, there were no significant savings in carbon emissions from economic dispatch at Boswell 3.

### C. Otter Tail Power Company

#### a. Self-Commitment Requirements

Otter Tail noted that both Big Stone and Coyote were part of its accredited capacity, and so it

[4] Minnesota Power attributes this savings to coming off an outage, rather than decommitment due to economics.

cannot, at this time, offer either on a seasonal basis.

Coyote Station is jointly owned by Otter Tail, Minnkota Power Cooperative, Montana Dakota Utilities, and Northwestern Energy, and operates in both MISO and SPP. Since May 2021, it has been economically committed. However, since much of its coal costs are considered fixed for the purposes of dispatch, there are relatively few hours throughout the year where it did not make economic sense to operate the plant.

Big Stone is joint owned by Otter Tail, Montana Dakota, and Northwestern, and similarly operates in both SPP and MISO. Big Stone may be economically dispatched when all owners agree. As all fuel costs are considered variable, it is more frequent that market prices are below variable operating costs.

Otter Tail also noted the single-day commitment at MISO which may artificially inflate costs of operating the plant.

#### b. Otter Tail-Specific reporting

Otter Tail evaluated its mine-mouth coal contract at Coyote Station but found that there is little scope for modification to address fluctuating market conditions. Otter Tail noted that changes would require agreement both between it and the mine-owner/operators, and between it and the plant co-owners, plus potentially the mine-owner's lenders.

#### c. Carbon Emissions

**Table 3 – Otter Tail Carbon Dioxide Emissions**

| Unit | Actual Tons | Avoided Tons |
|---|---|---|
| Big Stone | 2,390,422.7 | 24,033[5] |
| Coyote Station | 2,787,970.8 | |

### D. Department Comments

The Department filed comments evaluating the completeness of the utilities' filings and examining their record on economic commitment. The Department focused its analysis on times when the utilities' variable cost was greater than Locational Marginal Price (LMP). It noted that the issue here is two-fold – generation at these times both raises consumer costs, as generation by higher costs self-committed facilities is replacing lower-cost wholesale purchases, and uneconomic operation may be displacing lower-cost renewable resources.

[5] Reported by Department, p. 39

### a. Economic Dispatch

The Department evaluated economic dispatch at Boswell 3 & 4 and found that a more detailed analysis was not warranted. Boswell 3 was economically dispatched the entire year, while Boswell 4 was must-run the entire year with justification, and both were profitable more hours than not.

The Department evaluation of Big Stone and Coyote warranted a deeper analysis. Big Stone was run at net cost for a significant number of hours – 3,249 hours, against 3,289 at net benefit. Coyote has a discrepancy depending on whether all fuel is treated as variable, or only part of fuel is treated as variable (which is how Otter Tail handles fuel at Coyote).

The Department identified that many, but not all, of the loss-making times were identified by Otter Tail as times when co-owners required Big Stone or Coyote to run. The Department asked Otter Tail to provide explanation in reply comments if it can reduce must-run commitment in periods where no must-run commitment requirement from co-owners is noted. The Department also recommended that Otter Tail explore the potential of more flexible arrangements with other plant co-owners that can be in the interest of OTP ratepayers.

In Reply Comments, Otter Tail noted that most of those periods were times when co-owners required the plant to run, but Otter Tail agreed for various reasons. In response to discussion, Otter Tail and the Department agreed that Otter Tail would mark those times separately in future reporting.

The Department noted that another driver of losses was that SPP prices were higher, sometimes significantly so, than MISO prices. This resulted in dispatch decisions that may have been beneficial to SPP owners of the plants, but were detrimental to the MISO owners, such as Otter Tail and its customers. The Department appreciated Otter Tail's analysis around this point and recommended that Otter Tail provided similar analysis in future filings.

In Reply Comments, Otter Tail specifically cited divergence of average LMP day ahead prices, noting that, at Big Stone, 2022 average LMP prices were $19.40 for MISO, while they were $31.60 at SPP. At Coyote, the equivalent numbers were $38.27 for MISO and $40.18 for SPP. The higher SPP prices could easily motivate the SPP utilities to dispatch at times when it would be uneconomic for the MISO utilities.

For Xcel Nuclear, the Department found that both nuclear plants operated at a net benefit most hours of the year, and that no additional analysis was needed.

For King plant, though it was operating under economic commitment, it operated at net cost for most of the year, as Xcel reported variable costs even for hours when there was no energy. Similar patterns existed at Sherco 1 and 2. The Department decided a deeper analysis of King and Sherco 1 was warranted, but that a deeper analysis of Sherco 2 and 3 was not warranted.

The Department found that, despite the large number of net cost hours, King was dispatched economically and generated net benefits February through March, July through September, and in late December. The losses the rest of the year reflected periods of low or no operation, rather than loss-making operations. Economic commitment helped save money during large periods of time throughout the year.

Sherco 1 did not have any prolonged periods of operation at net cost. Even though it was operating must run, MISO did not dispatch it during multiple periods. The Department identified the auxiliary boiler construction as a factor which should help Xcel incorporate greater flexibility at Sherco, but overall recommended that Xcel keep operating these units flexibly and identify opportunities to further reduce costs and operating minimums.

### b. Renewable Impact

The utilities reported on wind curtailment in the 2022 reports. All data was reported on a trade secret basis but is summarized in the trade secret version of the Department Comments. The largest increase in curtailment was seen by MP. All three utilities saw increased curtailment, an issue the Department asked utilities to explain in reply comments.

In reply comments, the three utilities cited different reasons for the increased wind curtailment.

Xcel noted transmission constraints increasing in 2022 relative to 2021. Minnesota Power noted that its reported data in 2022 contained more types of curtailment than it had reported in 2021, so the increase was an artifact of the reporting rather than representing a real increase in curtailment. Otter Tail cited low LMPs and system reliability as motivating its curtailments, but noted that curtailments originated from MISO, not from itself.

### c. Additional Information Requested in Comments

The Department noted that Xcel had relatively high Equivalent Forced Outage Rates at its units and asked if these numbers had increased in recent years, and for an explanation of the high EFOR.

The Department recommended that Xcel explain reasons behind dispatch differences between Plexos modeling and MISO day-ahead awards and ways to generate more realistic comparison benchmarks from its modeling for the best and worst case analysis.

The Department recommended that OTP explain in reply comments how much of the disagreements between its units' owners is due to divergent financial incentives.

The Department recommended that Otter Tail explain in reply comments why the actual net benefits for both its units is outside the range of self-commitment and economic scenarios.

The Department recommended all three utilities explain in reply comments the reasons behind the large amounts of curtailment both for company owned and contracted wind facilities, and the contribution of must-run units toward that curtailment.

The Department recommended that MP provide net benefits for its best- and worst-case scenarios along with actual net benefits for Boswell 3 and 4 in reply comments.

## E. Reply Comments

In Reply Comments, the utilities addressed the Department's issues noted above. Additionally, the utilities, Fresh Energy & the Sierra Club, and the Department addressed questions raised by Commission Staff, regarding whether the Commission should take action in this docket relating to legislation during the 2023 legislative session.

### a. 2023 Legislative Session

During the 2023 Legislative Session, Minnesota Statute 216B.2422 was amended as follows:[6]

Subd. 8.

**Carbon dioxide emissions reduction.**

(a) The commission may issue an order to reduce carbon dioxide emissions from coal-fired electric generating units located in Minnesota that do not have applicable capacity obligations with a regional transmission organization and are wholly owned by a public utility required to file a resource plan under this section. The order may:

(1) require the public utility to develop and implement a plan to operate coal-fired electric generating units only during the months of June, July, August, December, January, and February, other than for emergency or reliability purposes; or

(2) establish an annual limit on the carbon dioxide emissions from coal-fired electric generating units.

(b) Nothing in this subdivision affects a public utility's obligation to comply with the provisions of section 216B.1691.

On June 24, 2023, Commission Staff asked parties to provide comments in reply comments on the question:

[6] 2023 Minn. Laws ch. 7, § 22.

- Are there any modifications to reporting requirements that should be made due to the changes to Minnesota Statute 216B.2422 or other statute during the 2023 Legislative session?

Parties had the following comments on this issue:

Otter Tail noted that it no longer owns any facilities subject to the legislation and does not believe any modifications to its reporting requirements are needed. Otter Tail also believed that this docket should remain informational, rather than enforcement oriented.

Minnesota Power saw no need to amend its filing requirements in this docket, as it does not currently incorporate seasonality in its operations. Consideration of whether and how the Commission should implement this new statutory authority with respect to MP is more appropriately addressed in a future resource plan.

Xcel reiterated that, due to concerns from the Independent Market Monitor and the results of the 2022/2023 PRA auctions, it transitioned from seasonal to economic dispatch at Sherco 2 and King. However, Sherco 2 and King did not clear the 2023/2024 PRA auction. Currently, both plants are being committed on a limited basis due to low gas commodity and market energy prices; therefore, Xcel does not anticipate a transition back to seasonal operations would have a great effect. However, if the Commission were to order Xcel to return to seasonal operations at King, Xcel committed to continue reporting in a manner consistent with the reporting approved in Docket No. E002/M-19-809, where the Commission originally approved its plan to transition to seasonal operations.

Fresh Energy and the Sierra Club recommended that the Commission direct Xcel to limit King and Sherco 2 to seasonal operation until each unit's retirement. They noted that Sherco 2 is retiring at the end of the year, but that even a few months of seasonal operations would have benefits. They recommended that Xcel be required to file a plan within 30 days of the Commission hearing date, and that it be approved subject to a 30-day negative check-off process.

The Department of Commerce noted that utilities already have flexibility to offer coal fired generation under flexible operating conditions, including seasonal dispatch, and are required to operate their facilities efficiently. The Department recommended that, given the complexities of multiple jurisdictions, the Commission avoid further complexity in directing utility's operations.

In response to parties' comments, Xcel Energy reiterated that it is not opposed to working with parties to develop a long-term plan for seasonal operation of King, but could begin seasonal operation this fall, prior to approval of such a plan. However, Xcel noted that MISO resource needs are not necessarily predictable.

### b. Additional Recommended Filings

The Department of Commerce reviewed Xcel, MP, and Otter Tail's reply comments, and found that they were complete. The Department concluded that there is no need for additional compliance filing in the instant docket for 2022.

The Department of Commerce recommended the Commission keep all existing reporting requirements unchanged for next year.

## F. Staff Analysis

Staff notes that, though in its opinion Xcel discontinuing seasonal operations in response to MISO needs was consistent with its July 15, 2020 Order in Docket E-019/M-19-809, that Order, approving Xcel's plan for seasonal deployment, was never revoked or lifted. As such, Staff believes that it is still in effect and, if the conditions that caused Xcel to stop seasonal operations at King and Sherco are no longer in effect – that is, if the Independent Market Monitor concerns relating to capacity are no longer in effect and these facilities are no longer needed for the PRA auctions then, under the Order, Xcel could be operating these facilities on a seasonal basis without need for a further Commission Order. Staff has provided a Decision Option clarifying that the Final Order in M-19-809 still is operational, but Staff does not believe such clarification is legally needed for Xcel to reinstitute seasonal operations.

Staff also generally agrees with the Department that, if seasonal operations are an economically efficient and environmentally sound deployment strategy for a given facility and in the best interest of Minnesota ratepayers, the facility is not otherwise needed for capacity, and MISO/SPP is amenable, a utility has the authority to implement seasonal operations without coming to the Commission for permission and should do so.

## DECISION OPTIONS

1. Find that Xcel Energy's March 1, 2022 filing as amended on April 21, 2022 in this docket is adequate and met the filing requirements. (Xcel Energy, Department)

2. Find that Minnesota Power's March 1, 2022 filing in this docket is adequate and met the filing requirements. (Minnesota Power, Department)

3. Find that Otter Tail Power's March 1, 2022 filing in this docket is adequate and met the filing requirements. (Otter Tail Power, Department)

4. Clarify that Xcel's seasonal dispatch plan is still approved under the Commission's July 15, 2020 order in Docket No. E-002/M-19-809 and that Xcel should continue to follow it unless MISO's Independent Market Monitor raises concerns or the King plant clears the Planning Reserve Auction. (Staff, implementing Docket E-002/M-19-809)

5. Require Xcel to develop a plan to operate the coal-fired electric generating Allen S. King plant and Sherco Unit 2 only during the months of June, July, August, December, January, and February, other than for emergency or reliability purposes, unless Xcel must offer the unit to fulfill capacity obligations. Require Xcel to file the plan in this docket within 30 days of the Commission meeting date. Delegate authority to the executive secretary to approve the plan via notice if no objections are filed within 30 days of the plan's filing. (Fresh Energy)

6. Maintain the current reporting requirements for future years, with no modifications. (Department of Commerce)