



February 20, 2024

Montana Public Service Commission  
1701 Prospect Avenue  
PO Box 202601  
Helena, MT 59620-2601

Re: Docket No. 2022.09.087 – Request for information regarding system operations during recent severe weather conditions

Dear President Brown and Commissioners:

NorthWestern Corporation d/b/a NorthWestern Energy (“NorthWestern”) submits to the Montana Public Service Commission (“Commission”) responses to the January 30, 2024 letter from Commissioners requesting information regarding system operations during recent severe weather conditions.

NorthWestern provides responses to the following nine items in the attached document and Excel file, Attachments A and B respectively.

- (1) Total balancing area load on an hourly basis.
- (2) Hourly imports and exports on each transmission path that interconnects NorthWestern’s balancing area with the Western Interconnection.
- (3) Total retail load obligation of NorthWestern’s supply function on an hourly basis.
- (4) Total energy delivered on an hourly basis from each of the following resources/resource categories used to supply the retail load obligation of NorthWestern’s supply function:
  - a. Hydroelectric facilities
  - b. Wind facilities
  - c. Solar facilities
  - d. Basin Creek
  - e. Dave Gates Generating Station
  - f. Colstrip
  - g. Thermal Qualifying Facilities
  - h. Contracted capacity
  - i. Day-ahead and hour-ahead energy purchases
  - j. Other (please describe)



- (5) Hourly variable expenses incurred by the supply function for each of the supply sources listed in (4)
- (6) Hourly revenue from energy sales by the supply function.
- (7) Hourly system-representative temperatures (i.e., single temperature figures that reflect a range of load center temperatures across the balancing area).
- (8) Aggregate energy from all sources that have not received capacity accreditation pursuant to the Western Resource Adequacy Program on an hourly basis.
- (9) The difference, in average megawatts, between the scheduled load and delivered energy for retail choice customers, on an aggregate, hourly basis.

The Commission requested that NorthWestern provide a discussion in response to the additional information requested on the following:

1. Whether the Western Power Pool initiated any sharing events pursuant to the Western Resource Adequacy Program, whether NorthWestern received or provided capacity or energy as a result, and NorthWestern's assessment of liquidity in the wholesale energy market during this period and the basis for that assessment, and
2. An explanation regarding the Colstrip facility maintenance during the cold weather event timeframe, including what maintenance was performed, when the need for the maintenance was determined and scheduled, NorthWestern's involvement in the planning and decision-making regarding the timing of the maintenance, and whether it is normal practice to schedule maintenance of the facility in peak load months.

In addition, NorthWestern provides an overview of the severe weather event from NorthWestern's perspective that includes a review of the hedging issue that arose in certain media, an overview of the performance of all its generation, and key takeaways from the event. NorthWestern intends the overview to complement the responses that are attached, developed in response to, and consistent with the Commission's questions. NorthWestern's responses to the additional questions #1 and #2 above are included in this overview.



## Introduction and Overview

Between January 11 and 16, 2024, Montana experienced a very severe and sustained duration cold weather event. System needs were at a critical high; the balancing authority set a new system peak on January 13, as did the natural gas transmission system. NorthWestern experienced its highest ever sustained load over the six-day period. Electric market prices in the Northwest Region were \$600 to \$1,000 per megawatt-hour (“MWh”) for this period (approximately 8 to 14 times higher than the average price from January 1 through January 10). January also saw huge temperature variability. Many locations experienced an approximately 90-degree temperature swing from the coldest day compared to both shortly before and shortly after this event.

The Western Resource Adequacy Program (“WRAP”) is currently in its non-binding phase for all participants. Since WRAP is not yet binding, there were no sharing events during this period, and NorthWestern did not receive or provide energy or capacity under the program. The first binding season for WRAP is targeted for summer 2026.

NorthWestern’s assessment of the liquidity of the wholesale market is that the market was extremely tight in this period. The primary indicator of this is that market prices were extremely high, likely far above even the cost of the least efficient gas-fired units. Both day-ahead and hourly market prices were near the \$1,000 per MWh, the Western Electricity Coordinating Council cap, for several days. The day-ahead index prices at Mid-Columbia for the six days between January 11 and January 16 were all among the top ten highest-priced days since 2002. The high day-ahead prices indicate that load-serving entities were concerned about finding enough energy to serve their loads and thus were willing to pay historically high prices day ahead to ensure that they had the supply necessary to meet their load serving obligations.

As reflected in NorthWestern’s responses to the Commission’s questions numbered 3 and 7, the forecasted timing and severity of this weather event changed daily. This reflected an increasing severity of the event – decreasing expected temperatures, increasing expected loads, and also a broader affected geographical area of the event.

As the severity of the event became more clear, energy supply, transmission, and distribution all had prior event planning and coordination. System modeling and worst case contingency planning/preparations began days prior to the event. Continuing this coordination through the event was key to managing events that occurred. Many crews worked around the clock in extremely difficult field conditions to help maintain reliability.

This overview also addresses the hedging issue, an issue that arose in a reporter’s misleading article which was then spread via social media. This overview also summarizes the performance of all its generation by type, and key takeaways from the event. It is intended to complement the spreadsheet that is attached, developed in response to and consistent with Commission staff’s questions.



## Market Costs

NorthWestern estimates that customers incurred about a net \$40 million liability over this event. From a Power Costs and Credits Adjustment Mechanism (“PCCAM”) perspective, a single significant weather event, nearly impossible to adequately model, can result in costs that lead to an under-collection compared to the base. Further, note that NorthWestern shareholders also have a potential financial liability with this weather event due to the 90/10 sharing mechanism. In isolation, the six-day event created about a \$4 million negative impact on shareholders. The best way to lower the PCCAM base and diminish both customer and shareholder financial exposure to significant market volatility is through acquiring additional 24x7 generation.

## The Role of Hedging

A recent inaccurate article has led some to believe NorthWestern had no hedging in place during the recent severe cold snap. The article focused on how NorthWestern did not use the hedging mechanism the Commission approved several years ago and implied that not using this mechanism resulted in our customers being unhedged and therefore exposed to very high market prices. This was only a half truth. NorthWestern did not use that tool but had numerous other physical and financial hedges. Simply put, NorthWestern has a resource variability problem not a hedging problem.

First, the writer apparently had no understanding of what the hedging tool the Commission allowed in 2021 was able to accomplish. Specifically, it is limited to only addressing “NorthWestern’s forecasted on-peak load projected by month, with hedge volumes no greater than the forecasted monthly shortfall”<sup>1</sup>. For January of 2024, NorthWestern’s forecast did not indicate a shortfall and therefore use of that tool was not allowed.

Note that this tool could still be useful in the future if there was a significant and sustained resource outage or other significant modification to our portfolio that would leave NorthWestern customers short on a monthly basis in the future.

At the time this concept was provided to the Commission, it was intended to address monthly average short positions in certain summer and winter months. Since then, our portfolio has changed, and we are no longer short on a monthly forward-looking basis.

NorthWestern’s forecasted on-peak position for December 2023 and January/February 2024 are provided in Table 1 below. Assuming average generation and load, NorthWestern was/is long for the months noted above. Below is a table with expected generation for Dec 23 – Feb 24 that was used in forecasting our on-system generation.

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<sup>1</sup> Final Order No. 7816b in Docket No. 2021.09.112 ¶ 31.



**Table 1. Monthly Resource Positions**

|                 | Dec-23       | Jan-24       | Feb-24       |
|-----------------|--------------|--------------|--------------|
| Thermal         | 496          | 486          | 477          |
| Hydro           | 268          | 274          | 278          |
| Wind            | 233          | 255          | 198          |
| <u>Solar</u>    | <u>34</u>    | <u>43</u>    | <u>62</u>    |
| <b>Total MW</b> | <b>1,031</b> | <b>1,058</b> | <b>1,015</b> |
| <b>Avg Load</b> | <b>907</b>   | <b>919</b>   | <b>894</b>   |

On a forecast average month-ahead basis NorthWestern’s portfolio is currently long. The steps it has taken since Order 7816b was issued have for the time being addressed the monthly portfolio shortfall. However it is critical to understand that NorthWestern is still short on an hourly basis during peak events, especially if generation such as intermittent capacity is not available.

During this event NorthWestern was a net purchaser for 160 consecutive hours (including exercise of capacity contracts, day-ahead, hour-ahead, and Western Energy Imbalance Market (“EIM”) transactions).<sup>2</sup> During the dates covered in the Commission’s request (January 8 through 18), our owned resources and long-term on- and off-system contracts provided about 102 percent of our load requirements.

### **Resource Operations**

The level of cold temperatures our Montana system experienced did create challenges for all of our resource types. Effects included:

- Hydro – Hydro had reduced output (per our forecast) because of significant flow degradation due to river icing. Employees worked outside in very severe weather to mitigate icing at the dams. Impacts to production due to the loss of flow was communicated to marketing, and conditions were monitored and

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<sup>2</sup> If NorthWestern excludes capacity contract exercise and includes only day-ahead, hour-ahead, and EIM transactions, NorthWestern was a net purchaser for 93 consecutive hours.



communicated daily through the event. The plants performed well through the event and flows recovered as expected.

- Solar – Very low output because of snow cover, cloudy conditions, sun angle, and winter day length.
- Wind – A significant high pressure system resulted in nearly zero wind during the three highest-load days. Also temperatures exceeded cold temperature machine shutoff thresholds, even with the cold weather packages (minus 22 F) that resulted in very low or zero output for the coldest days. The shoulder days did see some wind generation which offset the need for some purchases.
- Gas Thermal – Assets generally performed well even with temperatures dipping below design temperatures of minus 40 degrees F, although there were some intermittent outages. The Dave Gates Generating Station crews managed to maintain a high level of reliability even during peak gas transmission system usage periods when natural gas was not available for gas-fired generation, the facility used diesel, as designed. The Basin plant, a 52-MW gas plant that serves our customers through a power purchase agreement (“PPA”), was curtailed during some peak gas usage periods.
- Colstrip Operations–
  - NorthWestern and Talen have a reciprocal sharing agreement which causes each owner to act like a 15% owner in Unit 3 and Unit 4. As such, NorthWestern has rights to 15% of the maximum output of each Unit 3 & Unit 4 (which, during the time when Unit 4 was down, resulted in approximately 111 MW of output to serve our customers, derived from Unit 3).
  - Small boiler tube leaks in Unit 4 were identified in November and December 2023. They were determined at that time to be small with limited risk to generation at that point in time
  - It was unknown how long the plant could be run after the small tube leaks were identified; however, it became apparent a scheduled outage to perform maintenance would be necessary as the leaks were beginning to worsen in early January.
  - These leaks became more pronounced in a fairly rapid manner and more immediate repairs became necessary. The decision, made jointly by NorthWestern, Talen, and the other owners, was to repair prior to the cold weather event rather than risk experiencing an outage during the event.
  - Once repairs became necessary, the work was scheduled to be undertaken January 7. Unit 4 was taken offline at that time with repairs originally scheduled to be complete Thursday January 11. Once repairs began, the work was determined to be more extensive than predicted and took another day for repairs to be completed.
  - Colstrip 4 returned to service on Friday, January 12 at 0630 and was back to full production capability that evening.



- Colstrip provided both energy and spinning reserve capacity during the event, meaning we held some generation in reserve.

As touched on above and shown in NorthWestern's data responses, intermittent generation was particularly challenged during the key days of this event, but it did operate before and after the critical days of the event.

## **Lessons Learned**

NorthWestern's concerns about reliance upon market purchases during critical events is increasing, as well as many other parties with a responsibility to serve. The North American Electric Reliability Corporation (NERC), in its 2023 Long Term Reliability Adequacy Report noted:

“This assessment provides clear evidence of growing resource adequacy concerns over the next 10 years. Capacity deficits are projected in areas where future generator retirements are expected before enough replacement resources are in service to meet rising demand forecasts.”

The geographical area that includes Montana is projected to have elevated risk in extreme conditions.

One conclusion of the event is that specific actions to enhance reliability during significant weather events are needed, including adding new resources with critical reliability attributes and making existing resources more dependable.

NorthWestern continues to note reliability concerns, especially as the lack of market liquidity continues to increase. However, customer affordability is also of key concern. The market index pricing for capacity-based market contracts exposes customers to the market volatility – which peaks during extreme weather events.

During this event, NorthWestern had up to 500 MW of on-system thermal generation (owned and contracted) and 100 MW of hydro, for a total of 600 MW that provided both a physical and to a large degree a financial hedge for our customers. It has over 600 MW of intermittent wind and solar (primarily through PPA's, which basically provided no help during the key weather periods.

In addition NorthWestern has 350 MW of PPA capacity contracts (only called upon when necessary) that were used to help provide portfolio reliability. One of these contracts – for 100 MW reflects a gas generator's economics and is priced accordingly so it also served as a financial hedge during this period, saving customers approximately \$8 million compared with purchasing those volumes in the day-ahead market.

In summary NorthWestern has a diversified group of physical and financial resources in place which helped protect customers during this severe cold weather. An obvious



takeaway is that our customers do need additional on-system generation that can provide both physical and financial protection for market explosions. In other words our system needs generation that can be available 24x7 when needed.

NorthWestern is diligently working to accomplish this critical task; key is the completion of the 175-MW Yellowstone County Generating Station and the transfer of the incremental 220 MW of Colstrip. If these plants had been available during this event we estimate (including the operating costs of both), our customers would have saved about \$32 million out of the \$40 million spent of power purchases.

Another key takeaway is the need for a planning reserve margin, which is also reflected in the WRAP requirements. Equipment can have mechanical issues during these types of events. No resource is immune. Therefore having some additional (beyond our peak needs) on-system dispatchable incremental capacity available during these events is necessary to provide additional protection for our customers.

Sincerely,

John Hines  
Vice President Supply/Montana Government  
Affairs

Enclosures



## CERTIFICATE OF SERVICE

I hereby certify that NorthWestern Corporation d/b/a NorthWestern Energy's response to the Montana Public Service Commission's request for information regarding system operations during recent severe weather conditions in Docket No. 2022.09.087 has been e-filed with the Commission and emailed to the email list below.

February 20, 2024

/s/ Tracy Lowney Killoy  
Administrative Assistant  
Regulatory Affairs

Montana Public Service Commission

[wrosquist@mt.gov](mailto:wrosquist@mt.gov)

[lucas.hamilton@mt.gov](mailto:lucas.hamilton@mt.gov)

NorthWestern Energy

[shannon.heim@northwestern.com](mailto:shannon.heim@northwestern.com)

[sarah.norcott@northwestern.com](mailto:sarah.norcott@northwestern.com)

[cyndee.fang@northwestern.com](mailto:cyndee.fang@northwestern.com)

[tracy.killoy@northwestern.com](mailto:tracy.killoy@northwestern.com)

[glenda.gibson@northwestern.com](mailto:glenda.gibson@northwestern.com)

Montana Consumer Counsel

[jbrown4@mt.gov](mailto:jbrown4@mt.gov)

[ssnow@mt.gov](mailto:ssnow@mt.gov)