Northwest **Power** and **Conservation** Council

October 5, 2021

TO: Council members

FROM: Brian Dekiep, Senior Analyst Montana Office

SUBJECT: Ben Fitch-Fleischmann, Ph.D. Manager, Energy Supply Planning NorthWestern Energy will cover the 2020 Supplement to the 2019 Electricity Supply Resource Procurement Plan and other matters at Northwestern Energy in Montana.

BACKGROUND:

https://www.northwesternenergy.com/docs/default-source/default-document-library/about-us/regulatory/2019-plan/2020-supplement-to-the-2019-electricity-supply-resource-procurement-plan.pdf

NorthWestern Energy (NorthWestern) has assembled its 2020 Supplement to the 2019 Electricity Supply Resource Procurement Plan (2019 Plan) to provide additional information about certain key aspects of the 2019 Plan and ongoing developments in regional markets and supply planning efforts in the Pacific Northwest. The key issues addressed in this 2020 Supplement include:

- The development of a Resource Adequacy program for our region;
- The application of Effective Load Carrying Capability (ELCC) as a measurement of the capacity contribution provided by variable energy resources like wind and solar and energy-limited resources like batteries and pumped hydroelectric (hydro) energy storage;
- An analysis of the duration of events when NorthWestern is capacity deficit and discussion of the implications this has for future resource considerations; and
- Additional modeling scenarios.

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The key conclusion of the 2019 Plan remains the same: the region faces an increasing probability of near-term deficits in its power supply during peak load conditions, and the chance of shortages is expected to grow unless the region invests in new capacity.

Outages in California suggest that shortages may be arriving sooner than expected. According to the California system operator, these shortages occurred in part because "resource planning targets have not kept pace to lead to sufficient resources that can be relied upon to meet demand in the early evening hours."

NorthWestern currently stands out among our regional neighbors as the utility that relies most heavily on others to meet peak needs. Although other utilities are seeking to add new capacity to serve their customers' peak needs, it is unwise and unreasonable for NorthWestern to expect these utilities to add sufficient extra capacity that would be necessary to meet their peak needs in addition to their own.

Utilities across the region, including NorthWestern, are taking action to maximize the cost-savings from coordinated and efficient sharing of generation resources by taking advantage of geographic diversity in the timing of renewable generation and peak loads. While the timing of peak electricity demands across the region is correlated (the weather patterns are generally similar), there is some variation across different utilities' service areas.

Efforts to develop a program to coordinate the sharing of resources will allow the region's utilities to capture potential benefits of diversity in loads and weather-driven generation and thereby reduce the total cost of a reliable and adequate power supply for the region as a whole and to the participants.

The development of this program is being led by the Northwest Power Pool and is described more in Chapter 2 Developments in Regional Markets. Though the program is still in development, it is likely that utilities that participate will be required to meet the program's resource adequacy standards or will be assessed penalties for failing to meet those standards.

The Regional Capacity Position: A range of recent analyses conclude that the Pacific Northwest faces a near-term shortage of power supplies during peak load conditions. These include studies by the Council, the Northwest Power Pool, and consultants. The Northwest Power Pool offers a clear summary: "Although each study differs in scope and methods, a common finding across most of these studies is that the Northwest is either capacity-short today or will be within the next two years." Depending on the particular methods and assumptions, these studies place the probability of demand exceeding supply in the range of 7 percent as soon as 2021 and up to 26 percent in 2026 (NWPCC). This is well above the 5 percent threshold that has been established as the limit for an adequate power supply. One study estimates that the need for new firm capacity rises to 16,000 megawatts (MW) by 2030 if all coal in the region is retired. This represents a substantial regional shortfall (for comparison, 16,000 MW is about 13 times larger than NorthWestern's peak capacity needs).

NorthWestern's Capacity Position: NorthWestern's current generation portfolio is too small for meeting our peak loads and thus requires us to rely significantly on imported power from other utilities or independent power producers. Their peak loads are in the range of 1,200 to 1,250 MW and the portfolio currently has an effective load-carrying capability of about 840 MW.7 This is about 600 MW less than what industry standard utility planning practices would recommend (standard practice is to have capacity equal to peak loads plus a "planning reserve margin" in the neighborhood of 13-18%).

As the region now confronts a deficit as a whole, NorthWestern's heavy reliance on purchases from other utilities becomes increasingly risky. If the remaining generation facilities at Colstrip shut down, our deficit will increase by about 238 MW.8 The effective load-carrying capability of a generation portfolio is less than the total nameplate capacity. The difference is that the nameplate capacity is the maximum power each resource can provide under ideal conditions, and the effective load-carrying capability is the amount of capacity the resource can be expected to provide during peak load conditions.

A resource's ability to serve peak loads depends on a range of factors that include the weather, fuel supplies, resource operating capabilities, and unexpected outages. Thus, measurements of a generation portfolio's peak-serving capacity use probabilistic assessments based on simulations of loads and generation output under a range of conditions. The generation resources currently under NorthWestern's control include a diverse range of fuel types and resource ownership arrangements. About 65% of NorthWestern's installed capacity is dependent on the weather. The following table and graphic show NorthWestern's current and projected capacity position if no action were taken to remedy the projected deficits.

Figure 2: NorthWestern's Capacity Position