

**STATE OF NORTH DAKOTA
BEFORE THE
PUBLIC SERVICE COMMISSION**

Northern States Power Company
Advanced Prudence –
460 MW Sherco Solar Facility

Case No. PU-21-152
OAH File No. 20210274

LATE-FILED EXHIBIT NSP-20

Northern States Power Company (the “Company”) submits this late-filed exhibit to provide the Commission with additional information regarding its 10 MW/1,000 MWh long-duration energy storage project to be constructed at the Sherco site in Becker, Minnesota (the “Form Energy Project”).¹

The Form Energy Project will use Form Energy’s iron-air battery technology, which has some key characteristics that distinguish it from the lithium-ion batteries that are more commonly used for utility-scale applications. Perhaps most importantly, the Form Energy iron-air batteries can discharge for a much longer time period than lithium-ion batteries. The Form Energy Project is designed to provide up to 100 hours of 10 MW discharge. Provided the batteries work as designed when deployed, which the Form Energy Project should demonstrate, this extended discharge can help ensure system reliability during extended peak periods such as multi-day extreme weather events. Other key characteristics of Form Energy’s batteries are (1) the materials used, including iron ore, are abundant and relatively affordable; (2) the batteries have no heavy metals, contain a non-flammable aqueous electrolyte solution, and do not have the risk of thermal runaway associated with some other types of batteries; and, (3) the system is modular, consisting of modules installed in enclosures the size of shipping containers, which makes siting, construction, and expansion relatively easy as compared to some other types of long-duration energy storage, such as pumped hydropower and molten salt energy storage.

As more renewable resources are added to the system, long-duration batteries are one carbon-free resource the Company can use to provide needed capacity during periods when there is less renewable generation. The Company also anticipates that it will frequently charge the batteries during times when there is excess energy from renewable generation that might otherwise be curtailed, which should keep charging

¹ Xcel Energy is also pursuing a parallel 10 MW / 1,000 MWh project in Colorado at the site of the Comanche Generating Station in Pueblo, Colorado.

costs low. The proximity to the PV solar projects at the Sherco site² and to a terminus of the proposed 345kV Lyon County to Sherburne County transmission line that will connect to renewable resources in Southwestern Minnesota³ will facilitate such charging.

By deploying iron-air batteries now at utility scale, Xcel Energy can obtain a system resource and learn important lessons regarding this type of battery while leveraging grant funding and tax credits to keep down costs. The Company is pursuing the investment tax credits available as a result of the Inflation Reduction Act to reduce costs including a base 30% credit, a 10% bonus for projects locating in energy communities, and, potentially, another 10% bonus for domestic content. Xcel Energy has also received two contingent \$10 million grants from Breakthrough Energy Catalyst for each of the projects located in Minnesota and Colorado. Additionally, Xcel Energy applied for a substantial grant from the Department of Energy which, if received, would further reduce project costs.

Form Energy is a startup founded in 2017 by energy storage industry veterans and an MIT professor focused on battery technology. It is well-capitalized having raised over \$800 million from prominent investors. The firm has carried out testing of its technology and the results are promising. Form Energy has a pilot manufacturing line in the Pittsburgh Area to develop its manufacturing process and is building a factory in Weirton, West Virginia. Construction on that factory began on May 26, 2023 and battery manufacturing is planned to start in mid to late 2024.

Great River Energy has contracted with Form Energy for a 1.5 MW/150 MWh pilot project located in Cambridge, Minnesota, which is expected to be deployed by December 31, 2024. The two Xcel Energy projects will follow this Great River Energy project. Southern Company has also announced a 15 MW/1,500 MWh project for Georgia Power, but that project should follow the two Xcel Energy projects.

The Company sought approval from the Minnesota Commission for the Form Energy Project as an energy storage system pilot project pursuant to Minn. Stat. § 216B.16, subd. 7e. The Minnesota PUC granted that approval in an Order issued on August 1, 2023.⁴

² Both the Project that is the subject of this matter and Sherco Solar 3 Project (see Case No. PU-23-182).

³ The Company filed its ADP application seeking approval for the line on March 23, 2023. The matter is pending as Case No. PU-23-142.

⁴ Order Approving Pilot Project, In the Matter of Xcel Energy's Petition for a Long-Duration Energy Storage System Pilot Project at Sherco, Docket No. E002/M-23-119 (Aug. 1, 2023).