August 7, 2024

Mr. Cru Stubley
Secretary to the Commission
Public Service Commission of Wisconsin
P.O. Box 7854
Madison, WI 53707-7854

Re: Joint Application of Wisconsin Power and Light Company, Wisconsin Public Service Corporation, and Madison Gas and Electric Company for a Certificate of Authority for Construction, Installation, and Ownership of an Energy Storage System, Known as Columbia Storage, in Columbia County, Wisconsin
Docket No. 5-CE-156

Dear Mr. Stubley:

Pursuant to Wis. Stat. § 196.49, Wisconsin Power and Light Company ("WPL"), Madison Gas and Electric Company ("MGE"), and Wisconsin Public Service Corporation ("WPSC") (together "Applicants") submit this application for a Certificate of Authority ("CA") from the Public Service Commission of Wisconsin ("Commission") to construct, own, and operate a long-duration energy storage ("LDES") system with nominal capacity of 18 megawatts ("MW") for ten hours (i.e., 180 megawatt-hour ("MWh")). The system would be known as the Columbia Energy Storage Project ("CES" or "Project") and would be located at the site of the Applicants' Columbia Energy Center generating station ("CEC"). Pending Commission approval, the Applicants plan to start construction in 2025 and achieve commercial operation during 2027.

The CES supports the Applicants' commitment to providing safe, reliable, and affordable service to their customers through diverse resource portfolios. The CES would continue the Applicants' adaptation to changing conditions and transition to more cost effective and sustainable capacity and energy resources. LDES will help the Applicants align intermittent wind and solar generation with variable customer load, improve reliability, and enable the grid to accommodate more renewable generation resources. This complements the Applicants' ongoing investments in wind and solar generation and energy storage capacity.

Novel Energy Storage Solution

The Project would be the first commercial-scale implementation in North America of the Energy Dome closed-loop gas-to-liquid LDES solution. When charging, the CES would use electricity from the grid to drive a compressor, pressurizing carbon dioxide into an ambient-temperature liquid and storing it in tanks. When discharging, the CES would vaporize the liquid carbon dioxide, which generates electricity by driving a turbine and generator as it expands. The CES stores the

gaseous carbon dioxide in a large, dome-shaped bladder. The carbon dioxide cycles back and forth between a gas in the bladder and a liquid in the tanks. The CES would not emit carbon dioxide as it operates, and it does not require carbon dioxide additions after an initial fill.

Demonstrate Long-Duration Energy Storage

Each of the Applicants have announced greenhouse gas emission reduction goals to be achieved by 2050. Achieving these goals while meeting customers' expectations for reliable service requires intermittent renewable generation resources to work like baseload fossil generation resources, in terms of capacity factors, dispatchability, and frequency regulation. Currently available renewable net-zero generation resources occasionally experience multi-day dips in generation. The Applicants anticipate that LDES will bridge this gap, but various LDES solutions are at different stages of technological maturity. It is unclear which LDES solution or solutions will perform the best and be the most cost-effective. The CES would contribute to progress on this energy grid-wide challenge by demonstrating the commercial viability of the closed-loop gas-to-liquid LDES solution, while giving manufacturers and contractors the experience necessary to lower the cost of LDES in the future. At the same time, the CES brings benefits by generating value for the Applicants' customers.

Grant Funding

In addition to providing dispatchable energy and capacity, the CES benefits customers through a grant from the US Department of Energy ("DOE") Office of Clean Energy Demonstrations through the Bipartisan Infrastructure Law. The Applicants have executed a grant award agreement with DOE for $30.7 million of funding for project costs, which the Applicants anticipate receiving as the Project achieves construction and operation milestones. The Applicants' have heard the Commission's, stakeholders', and customers' concerns about energy affordability and appreciates the opportunity to use DOE funding to lower costs for customers. DOE awarded grant funding to the CES to demonstrate the viability of the Energy Dome closed-loop carbon dioxide gas-to-liquid energy storage solution for long-duration grid-scale commercial energy storage.

Capacity Need

Each of the Applicants need to add capacity resources. CES's peak discharge power is small relative to the Applicants' need. The Project complements the Applicants' other proposed capacity resources, including solar generation, gas generation, and other energy storage solutions. In its 2024 Summer Reliability Assessment, the North American Electric Reliability corporation forecast that the Midwest Independent System Operator is at elevated risk for operating reserve shortfalls during periods of high demand or low resource output. The CES provides dispatchable, all-season capacity.

Intermittent renewable generation can have extended periods of both high and low generation. During periods of low renewable generation, the CES would provide energy and capacity to mitigate tight energy market conditions. Recent years have seen more hours of negative locational marginal prices when energy from renewable generation (and other non-dispatchable resources like must-run fossil generation) exceeds energy demand. When renewable resources generate more energy than is needed, the CES acts as a load to absorb energy and redispatch it at other times when it is needed. All energy storage solutions can absorb excess energy, but LDES, like this Project, absorbs relatively more unused energy and provides more flexibility by re-dispatching it over longer periods.

Leveraging the Columbia Energy Center Site

The proposed and alternate project locations are on the site of the CEC, which the Applicants have announced they plan to retire by June 2026. Locating the Project at the CEC keeps the site productively engaged in the energy system as it transitions away from coal. This includes leveraging the transmission interconnection and substation already at the site, maximizing net benefits for customers, and reducing costs and environmental and human impacts by adding LDES capacity. The pending coal unit retirement potentially allows the Applicants' customers to benefit from bonus tax credits under the Inflation Reduction Act for energy communities, depending on the timing of the retirement.

Accounting for Local Benefits

The Applicants request Commission authorization to account for the Project in FERC Account 390, General Plant Structures and Improvements, rather than FERC Account 387.3. This accounting change would enable state utility aid shared revenue payments to the Town of Pacific, Columbia County, and Columbia County after the Applicants retire coal generation at the CEC and utility aid payments related to coal generation phase out.

Thank you for reviewing our application. Please contact any one of us with questions. Thank you.

Sincerely,

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Enclosures

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