

Staff Briefing Papers

Meeting Date **March 14, 2024**

Agenda Item 1*

Company Dakota Electric Association

Docket No. E111/M-23-495

In the Matter of Dakota Electric Association's Petition to Implement a Pilot Residential and Small General Service Behind-the-Meter Battery Storage Program and Tariff

Issues Should the Commission approve Dakota Electric Association's Residential and Small General Service Behind-the-Meter Battery Storage Pilot Program and related tariffs as found in the Company's December 5, 2023 petition?

Staff Yunpei Zhang yunpei.zhang@state.mn.us 651.539.1061

✓ **Relevant Documents**

Dakota Initial Filing

Date

December 05, 2023

Department Comments

January 29, 2024

Dakota Reply Comments

February 05, 2024

Department Letter

Feb 26, 2024

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BACKGROUND

Issue Statement

On its March 14, 2023, agenda meeting, the Commission is to consider the following issues:

- 1) Should the Commission approve the Behind-the Meter Storage Pilot Program for Residential and Small General Service customers?
- 2) Should the Commission approve the associated rate tariffs with the Pilot Program for Residential and Small General Service customers who choose to participate in the program?
- 3) Should the Commission approve a new Net Metering rate for those customers enrolled in the pilot program?

Overview

On December 5, 2023, Dakota Electric Association (DEA or Cooperative) filed a petition to implement a two-year pilot residential and small general service behind-the-meter (BTM) battery energy storage system (BESS) program. The Cooperative also requested approval of the associated rate tariff, which allows “members with a behind-the-meter battery energy storage system to receive lower priced energy for all load at the BESS premise in exchange for DEA having access to the BESS for reliability and economic purposes.”¹ DEA proposed the retail net metering rate be set at the proposed energy rate of \$0.0854 per kWh for all load with a Full Control Option (able to use battery for at least 4 hours) and \$0.1063 per kWh for all load with a Limited Control Option (able to use battery for at least 2.5 hours). The proposed tariff change is scheduled to go into effect no sooner than March 4, 2024 or upon Commission approval.

On February 5, 2024, the Cooperative filed reply comments regarding the Department’s additional information request on the net costs for an average customer in the pilot and the potential federal and state incentives available for potential pilot participants, along with a summary of findings within 60 days of the pilot’s end date. DEA estimated a net cost of \$11,000 for a member with Full Control Option and \$8,250 for a member with Limited Control Option over a 10-year period, which includes the upfront cost of purchasing equipment. The

¹ DEA Initial Filing, December 5, 2023, at 5.

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Cooperative also calculated the potential state and federal incentives with the assumption of the availability of a 30% federal investment tax credit and state incentives. The estimated potential incentives available are \$10,500 for a member with Full Control Option and \$8,000 for a member with Limited Control Option. However, DEA has concerns with collecting actual net costs and incentives used from members because of the potential to erode or impact the relationships they have with membership.²

Record to Date

On December 05, 2023, Dakota Electric Association made its initial filing.

On January 29, 2024, the Department of Commerce Division of Energy Resources (Department) filed comments.

On February 05, 2024, Dakota Electric filed reply comments.

On February 26, 2024, the Department filed a letter.

DISCUSSION

The Department was the only party to comment on DEA's petition. All issues were uncontested regarding the pilot program and the proposed rate tariffs with the exception of two reporting requirements suggested by the Department after the completion of the program.

A. PROPOSED PILOT SCHEDULE

DEA proposed this pilot program for residential and small general service behind-the-meter (BTM) battery energy storage systems (BESS) because of continued growth in distributed energy resources (DER) and growing interest from members in battery storage systems. The goal of this pilot is for DEA, as well as its members, to gain experience with this type of program and rate design, while at the same time being able to efficiently make adjustments, when necessary, to better align the program with the consumer expectations.³ DEA also explained the additional economic value from being able to control the battery to respond to wholesale price signals and system reliability concerns as well as the streamlining ability for DEA to provide additional value to its members and respond to changing market conditions.

Other than gaining economic value and streamlining ability, there are also several concerns associated with a BESS around which DEA believed this pilot could provide insight and potential solutions. Firstly, a BESS can be a significant electric load. If a BESS recharges too soon after an outage condition, it can strain the distribution system and cause a rebound outage. Secondly, it can represent a significant wholesale power risk borne by all DEA members if a BESS begins

² DEA Reply Comments, February 5, 2024, at 5.

³ DEA Initial Filing, December 5, 2023, at 6.

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charging during on-peak periods.⁴

In its comments, the Department evaluated the proposed pilot program with two principles. First, the tariff should enable DEA to verify particular assumptions used in the cost analysis, such as:

- the assumption that 80% of the BESS capacity would be available to DEA;
- an 80% coincidence factor for peak demand reduction;
- an average monthly usage of 694 kWh for members using the tariff; and
- an installed BESS size of 7 kW.

Also, DEA should learn from the pilot about when, how often, and why the BESS is accessed so that DEA can refine the tariff in the future. Second, the pilot should also give DEA experience to limit potential risks presented by new technologies.⁵

The Department concluded that the proposed pilot tariff fulfilled the two above requirements and recommended approval of the pilot.

B. Rate Schedule

DEA also requested approval of a new rate program and associated rate tariff in line with the pilot. Dakota stated that its existing tariff, Controlled Energy Storage (Schedule 51), which lists storage batteries as a qualifying material to be installed, was inappropriate for a BESS. As Schedule 51 restricts energy consumption to eight overnight hours (11pm to 7am) and expects these “charged loads” to be sustained for the remaining 16 hours, it would require the battery to carry load for 16 hours each day and it is not feasible with current battery technology.

To come up with the new rate program, DEA reviewed existing BTM battery storage program tariffs used by other utilities and determined that compensation generally falls into three categories. Further, DEA stated each option had its own characteristics that would be unfavorable for a BTM BESS and came up with an Option 4 that best suited with the pilot program. Table 1 provides summary of the pluses and minuses for the four options mentioned above.

⁴ DEA Initial Filing, December 5, 2023, at 6.

⁵ Department Comments, January 29, 2024, at 7.

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Table 1: Existing BTM BESS tariffs and DEA's proposal

Options	Schedule	Characteristics
Option 1	Upfront payment to customer based on the size of the battery, either on a kW or kWh basis	<ul style="list-style-type: none"> • provides upfront value
		<ul style="list-style-type: none"> • coupled with long-term agreement
Option 2	Monthly payment based on the installed or available kW of the battery	<ul style="list-style-type: none"> • in line with demand cost causation • provide additional value for customers to deliver additional kW
		<ul style="list-style-type: none"> • create customer confusion • absent detailed metering and susceptible to overcompensation
Option 3	Monthly payment based on the delivered or available kWh of the battery	<ul style="list-style-type: none"> • align with standard energy pricing
		<ul style="list-style-type: none"> • sub-optimal price signal for demand management • susceptible to overcompensation
Option 4 (DEA's Proposal)	Overall discount to all load tied to a BESS on a kWh basis	<ul style="list-style-type: none"> • align with the rate classes (Schedules 31 & 41) covered by the proposed pilot • provide participants incentive to manage loads to maximize potential benefits • provide the most realistic representation of system benefit and address overcompensation issue

DEA stated that Option 4 best aligned with the main objectives of the program to manage system costs, provide value to members, and provide certain distribution system and reliability benefits.⁶ DEA requested Commission approval of the proposed pilot with the following key provisions of this service:

- Available to residential and small commercial members currently receiving, or otherwise would receive, their main electric service through Schedule 31 or Schedule 41,
- Electrical load supplied under this rate will be metered at the main premise meter,
- Eligibility for pilot initially limited to whole home/main metered battery installations,
- Member receives per kWh rate of **\$0.08540** per kWh for all load on the full control option and **\$0.1063** per kWh on the limited control option,
 - To be eligible for Full Control compensation, BESS must have sufficient capacity to supply member load associated with BESS for a minimum of **4 hours** in duration,
 - To be eligible for Limited Control compensation, BESS must have sufficient capacity to supply member load associated with BESS for a minimum of **2.5 hours** in duration,

⁶ DEA Initial Filing, December 5, 2023, at 10.

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- Member participating in this service is not eligible for concurrent service under any other load management or special rate schedule except retail net metering, Schedule 55, when applicable, under new rates specific for BESS installations,
- BESS must be connected to Dakota Electric's demand response system,
- Member maintains ability to use BESS for emergency power in case of outage,
- Preference that recharge of BESS delayed for at least 30 minutes after disruption of service,
- If load is returned to supply by Dakota Electric because BESS is unavailable member may be assessed penalty charges for non-performance. If BESS is unavailable for two or more control events in a 12-month period, member may be removed from program,
- Maximum of 10 full control events per calendar month up to a maximum 40 total hours per calendar month,
- Maximum of 100 full control events per calendar year,
- No additional monthly fixed charge or demand charges are applied to this service,
- Designated as a pilot rate, which offers potential flexibility to adjust rates and conditions of service as more experience is gained with this service.⁷

In its comments, the Department evaluated DEA's rate design under four standard rate design principles: revenue recovery requirement, rate preference prohibited, energy planning and energy planning goals, reasonable rates, and decided that the statutory rate design principles have been met.

The Department recommended that the Commission approve the proposed rate tariffs and the new Net Metering rate for the Pilot Residential and Small Commercial BTM Energy Storage Service.

C. Net Cost and Potential Fund

In its comments, the Department asked DEA to answer three questions in its reply comments regarding net costs and potential funds of the pilot. The questions were:

1. What will be net costs for an average customer who installs a 4-hour battery and participates in the pilot's tariff?
2. What will be net costs for an average customer who installs a 2.5-hour battery and participates in the pilot's tariff?
3. How much of federal and state funds can be used by potential pilot participants?

In its reply comments, DEA answered the Department's questions with data collected from two operational battery-only interconnection applications on its distribution system installed in 2022:⁸

⁷ DEA Initial Filing, December 5, 2023, at 17.

⁸ DEA Reply Comments, February 5, 2024, at 3-5.

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Table 2: Net Costs for An Average Participant in BTM BESS Pilot

	Full Control (4-hour, \$)	Limited Control (2.5-hour, \$)
Upfront Installation Costs	25,000	18,000
30% Investment Tax Credit	7,500	6,000
State Battery Incentive	3,000	2,000
Total Potential Incentives (Line 3+4)	10,500	8,000
Average 10-Year Energy Cost Saving	3,500	1,750
Net Cost Over 10 Years (Line 2-5-6)	11,000	8,250

D. Reporting Requirement

Overall, in its comments, the Department recommended that the Commission approve Dakota's petition with a reporting requirement at the completion of the pilot, which should include the following the information:⁹

- DEA's next steps regarding scaling of BESS systems;
- If DEA intends to proceed with the proposed tariff or modify the tariff based on results from the pilot;
- Answers to the 3 questions above based on actual data collected through surveys from the pilot participants;
- The number of control events each participant was subjected to during the pilot.

In its reply comments, DEA agreed with providing information regarding the first two bullet points within 60 days of the pilot's end date but have concerns with the third and fourth points. For reporting tax and grant information with actual data collected from participants, DEA stated that it might be subject to intruding on participant's privacy and have a negative impact on member engagement. The same concern also applies to reporting control events and DEA only agreed with providing information at a macro level, such as the number of events, the duration, and level of compliance.¹⁰

On February 26, 2024, the Department filed a letter, which agreed with DEA on preserving personal information as privacy. The Department proposed that DEA report required information at an average level by aggregating the data across all pilot participants to both help gauge the success of the pilot and preserve customer privacy. The Department also stated that it is open to other changes of wording that DEA might propose to ensure the anonymity of data collected.¹¹

⁹ Department Comments, January 29, 2024, at 9.

¹⁰ DEA Reply Comments, February 5, 2024, at 5.

¹¹ Department Letter, February 26, 2024, at 1.

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STAFF ANALYSIS

Proposed Pilot Schedule

Staff finds Dakota's analysis regarding the goals of the proposed pilot reasonable and necessary and supports approving DEA's request for launching the BTM BESS Pilot for residential and small general service customers.

Rate Schedule

Staff agrees with the Department's evaluation of just and reasonable rates and supports approving the proposed rate schedule.

Reporting Requirement

Staff recognizes that providing tax and control events information could undermine pilot engagement and intrude participants privacy. Staff agrees with the Department's new proposal to provide that information at an average level by aggregating over all participants so that customer privacy is preserved and necessary information to evaluate the success of the pilot is also available. The Commission may want to ask for DEA's position on the Department's letter at the agenda meeting.

DECISION OPTIONS

1. Approve Dakota Electric's proposed Behind-the-Meter Storage Pilot program for Residential and Small General Service customers and associated rate tariffs as found in the Company's December 5, 2023, petition. (Dakota Electric, Department)
2. Require Dakota Electric to file a summary of the findings from the pilot program within 60 days of the pilot's end date, which must include the following information:
 - a) DEA's next steps regarding scaling of BESS systems;
 - b) If DEA intends to proceed with the proposed tariff or modify the tariff based on results from the pilot;
 - c) Answers to the following questions on an average level based on aggregating actual data collected from all pilot participants:
 - a. What were the net costs for an average customer who installs a 4-hour battery and participates in the pilot's tariff?
 - b. What were the net costs for an average customer who installs a 2.5-hour battery and participates in the pilot's tariff?
 - c. How much of federal and state funds were used by potential pilot participants?
 - d. The number of control events each participant was subjected to during the pilot. (Department, *Staff notes this reflects the Department's updated recommendations in its February 26, 2024 letter*)